

## CURRICULUM AND SYLLABI

# (AY 2022-2023)

B. Tech. Computer Science and Engineering and Business Systems (in collaboration with TCS)

B. Tech. Computer Science and Engineering and Business Systems (in collaboration with TCS)

### **CURRICULUM AND SYLLABI**

(AY 2022-2023 Admitted Students)



## Index

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### VISION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY

> Transforming life through excellence in education and research.

### MISSION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY

- World class Education: Excellence in education, grounded in ethics and critical thinking, for improvement of life.
- Cutting edge Research: An innovation ecosystem to extend knowledge and solve critical problems.
- Impactful People: Happy, accountable, caring and effective workforce and students.
- Rewarding Co-creations: Active collaboration with national & international industries & universities for productivity and economic development.
- Service to Society: Service to the region and world through knowledge and compassion.



### VISION STATEMENT OF THE SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

To be a world-renowned centre of education, research and service in computing and allied domains.

### MISSION STATEMENT OF THE SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

- To offer computing education programs with the goal that the students become technically competent and develop lifelong learning skill.
- To undertake path-breaking research that creates new computing technologies and solutions for industry and society at large.
- To foster vibrant outreach programs for industry, research organizations, academia and society.



# B. Tech. Computer Science and Engineering and Business Systems (in collaboration with TCS)

### **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**

- Graduates will be engineering practitioners and leaders, who would help solve industry's technological problems.
- Graduates will be engineering professionals, innovators or entrepreneurs engaged in technology development, technology deployment, or engineering system implementation in industry.
- Graduates will function in their profession with social awareness and responsibility.
- Graduates will interact with their peers in other disciplines in industry and society and contribute to the economic growth of the country.
- Graduates will be successful in pursuing higher studies in engineering or management.
- Graduates will pursue career paths in teaching or research.



### B. Tech. Computer Science and Engineering and Business Systems (in collaboration with TCS)

PROGRAMME OUTCOMES (POs)

- PO\_01: Having an ability to apply mathematics and science in engineering applications.
- PO\_02: Having a clear understanding of the subject related concepts and of contemporary issues.
- PO\_03: Having an ability to design a component or a product applying all the relevant standards and with realistic constraints.
- PO\_04: Having an ability to design and conduct experiments, as well as to analyze and interpret data.
- PO\_05: Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice.
- PO\_06: Having problem solving ability-solving social issues and engineering problems.
- **PO\_07:** Having adaptive thinking and adaptability.
- PO\_08: Having a clear understanding of professional and ethical responsibility.

- > **PO\_09:** Having cross cultural competency exhibited by working in teams.
- > **PO\_10:** Having a good working knowledge of communicating in English.
- PO\_11: Having a good cognitive load management [discriminate and filter the available data] skills.
- **PO\_12:** Having interest in lifelong learning.



# B. Tech. Computer Science and Engineering and Business Systems (in collaboration with TCS)

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

- The ability to apply theoretical foundations of Computer Science and problem-solving skills through programming techniques for complex real time problems using appropriate data structures and algorithms.
- The ability to design/develop hardware and software interfaces along with database management to meet the needs of industry.
- The ability to demonstrate personal, organizational and entrepreneurship skills through critical thinking, engage themselves in life-long learning by following innovations in business, science & technology.



### B. Tech. Computer Science and Engineering and Business Systems

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**CREDIT STRUCTURE** 

### **Category Wise Credit Distribution**

Category	Credits
Programme Core (PC)	72
Programme Elective (PE)	21
University Core (UC)	52
University Elective (UE)	6
Specialization Elective	9
Non-Credit Course	-
Total Credits	160





Programme	Programme	University	University	Specialization	Total
Core	Elective	Core	Elective	Elective	Credits
72	21	52	6	9	160

Course Code	Course Title	Course Type	L	Т	Р	J	С
	PROGRAMME CORE						
CBS1003	Data Structures and Algorithms	ETL	2	0	2	0	3
CBS1004	Computer Architecture and Organization	ETL	2	0	2	0	3
CBS1005	Software Engineering Methodologies	ETL	2	0	2	0	3
CBS1006	Principles of Operating Systems	ETL	2	0	2	0	3
CBS1007	Database Systems	ETL	2	0	2	0	3
CBS1008	Operations Research	ETL	2	0	2	0	3
CBS1009	Computational Statistics	ETL	2	0	2	0	3
CBS2002	Formal Languages and Automata Theory	TH	3	0	0	0	3
CBS2003	Design Thinking	ETL	2	0	2	0	3
CBS3001	Computer Networks	ETL	2	0	2	0	3
CBS3002	Information Security	ETL	2	0	2	0	3
CBS3003	Design and Analysis of Algorithms	ETL	2	0	2	0	3
CBS3004	Artificial Intelligence	ETL	2	0	2	0	3
CBS3011	Usability Design of Software Applications	ETL	2	0	2	0	3
CBS3012	IT Project Management	ETL	2	0	2	0	3
EEE1001	Basic Electrical and Electronics Engineering	ETL	2	0	2	0	3
MAT1004	Discrete Mathematics	TH	3	0	0	0	3
MAT2004	Linear Algebra	TH	3	1	0	0	4
MAT2005	Data Science and Statistical Modelling	ETL	2	0	2	0	3
MGT1064	Financial and Cost Accounting	TH	3	0	0	0	3
MGT1065	Fundamentals of Management	TH	2	0	0	0	2
MGT2002	Marketing Research and Marketing Management	TH	3	0	0	0	3
MGT2003	Financial Management	TH	3	0	0	0	3
MGT3016	Services Science and Service Operational Management	ETL	2	0	2	0	3
Course Code	Course Title	Course Type	L	Т	Р	J	С
0004044	PROGRAMME ELECT		2		-		
CBS1011	Programming in Python	ETL	2	0	2	0	3
CSE1007	IAVA Programming	ETI	3	1  0	2	$\square$	1



#### VIIT<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

ESP1001 - ESPANOL FUNDAMENTAL – TH

#### CURRICULUM (2022 - 2023)

Course Code	Course Title	Course Type	L	Т	Р	J	С
CBS3008	Introduction to Internet of Things	ETL	3	0	2	0	4
CBS3009	Advanced Social, Text and Media Analytics	TH	3	0	0	0	3
CBS3010	Mobile Computing	ETL	3	0	2	0	4
CBS3013	Conversational Systems	ETL	3	0	2	0	4
CBS3014	Modern Web Applications	ETL	3	0	2	0	4
CBS3015	Information Systems Audit and Control	TH	3	0	0	0	3
CBS3016	Cognitive Science and Analytics	ETL	3	0	2	0	4
CBS4001	Robotics and Embedded Systems	ETL	3	0	2	0	4
CBS4002	Cryptology and Analysis	TH	3	0	0	0	3
CBS4003	Quantum Computation and Quantum Information	ETL	3	0	2	0	4
CBS4004	Image Processing and Pattern Recognition	ETP	3	0	0	4	4
CBS4005	Enterprise Systems	ETL	3	0	2	0	4
Course Code	Course Title	Course Type	L	Т	Р	J	С
	UNIVERSITY CORE						
CBS1002	Object Oriented Programming	ETL	3	0	2	0	4
CBS1901	Technical Answers for Real World Problems (TARP)	ETP	1	0	0	4	2
CBS1902	Industrial Project	РЈТ	0	0	0	0	1
CBS1903	Comprehensive Examination	РЈТ	0	0	0	0	1
CBS1904	Capstone Project	РЈТ	0	0	0	0	12
CHY1701	Engineering Chemistry	ETL	3	0	2	0	4
CSE1008	Programming in C	ETL	3	0	2	0	4
ENG1013	Business Communication and Value Science - I	ETL	1	0	2	0	2
ENG1014	Business Communication and Value Science - II	ETL	1	0	2	0	2
ENG1017	Business Communication and Value Science- III	ETL	1	0	2	0	2
ENG1018	Business Communication and Value Science- IV	ETL	1	0	2	0	2
ENG1901	Technical English - I	LO	0	0	4	0	2
ENG1902	Technical English - II	LO	0	0	4	0	2
ENG1903	Advanced Technical English	ELP	0	0	2	4	2
HUM1021	Ethics and Values	TH	2	0	0	0	2
MAT1017	Probability and Statistics	TH	3	0	0	0	3
MGT2001	Introduction to Innovation, IP Management andEntrepreneurship	TH	3	0	0	0	3
PHY1005	Modern Physics	ETL	3	0	2	0	4
FLC4097	Foreign Language Course Basket	CDB	0	0	0	0	2



ENG2000

EXC4097

Foundation English - II

Co-Extra Curricular Basket

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

LO

CDB

0

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4 0

0 0

2

2

ESP2001 - ESPANOL INTERMEDIO – ETL
FRE2001 - Francais progressif – ETL
GER1001 - Grundstufe Deutsch – TH
GER2001 - Mittelstufe Deutsch – ETL
GRE1001 - Modern Greek – TH
JAP1001 - Japanese for Beginners – TH
RUS1001 - Russian for Beginners – TH

Course Code	Course Title	Course Type	L	Т	Р	J	С		
	SPECIALIZATION ELE	CTIVE							
HUM1046	Behavioral Economics	TH	3	0	0	0	3		
HUM1047	Engineering Economics	TH	3	0	0	0	3		
HUM1048	Industrial Psychology	TH	3	0	0	0	3		
MGT3001	Business Strategy	TH	3	0	0	0	3		
MGT3002	Advanced Finance	TH	3	0	0	0	3		
MGT4004	Human Resource Management	TH	3	0	0	0	3		
MGT4005	Computational Finance and Modelling	ETL	3	0	2	0	4		
Course Code	Course Title	Course Type	L	Т	Р	J	С		
	NON-CREDIT COURSES								
CHY1002	Environmental Sciences	TH	3	0	0	0	3		
ENG1000	Foundation English - I	LO	0	0	4	0	2		



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### **PROGRAMME CORE**

### (AY 2022 - 2023)

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Sl.No.	<b>Course Code</b>	Course Title	Page No.
1.	CBS1003	Data Structures and Algorithms	13
2.	CBS1004	Computer Architecture and Organization	15
3.	CBS1005	Software Engineering Methodologies	17
4.	CBS1006	Principles of Operating Systems	19
5.	CBS1007	Database Systems	22
6.	CBS1008	Operations Research	24
7.	CBS1009	Computational Statistics	26
8.	CBS2002	Formal Languages and Automata Theory	29
9.	CBS2003	Design Thinking	31
10.	CBS3001	Computer Networks	33
11.	CBS3002	Information Security	35
12.	CBS3003	Design and Analysis of Algorithms	37
13.	CBS3004	Artificial Intelligence	39
14.	CBS3011	Usability Design of Software Applications	41
15.	CBS3012	IT Project Management	43
16.	EEE1001	Basic Electrical and Electronics Engineering	45
17.	MAT1004	Discrete Mathematics	47
18.	MAT2004	Linear Algebra	49
19.	MAT2005	Data Science and Statistical Modelling	51
20.	MGT1064	Financial and Cost Accounting	53
21.	MGT1065	Fundamentals of Management	55
22.	MGT2002	Marketing Research and Marketing Management	57
23.	MGT2003	Financial Management	59
24.	MGT3016	Services Science and Service Operational Management	61



#### VITT<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course Code	Course Title	L	Τ	Р	J	С
CBS1003	Data Structures and Algorithms	2	0	2	0	3
Pre-requisite	NIL	S		ous v		n
<u> </u>				v. 1.0	)	
Course Objective						
•	symptotic performance of algorithms.					
-	near and non-linear data structures and their applications.					
3. To Perform sear	ching and sorting using various techniques and Graphs.					
Expected Course	Outcome:					
After completion o	f this course, students will be able to:					
1. Realize the basic	terminologies in data structures.					
2. Idealize the feature	ares of linear data structures and their applications.					
3. Demonstrate var	ious types of nonlinear data structures and their applications in	n real v	world	1.		
4. Choose appropri	ate sorting and searching technique for the given problem.					
5. Organize data us	ing files and understand various access methods					
6. Provide efficient	algorithmic solution and data structures to real-world problem	ıs.				
Module:1	Introduction to Algorithm & Data Organization					ours
Theta notation, P	ation, Recursion, Performance analysis, Asymptotic Notation rogramming Style, Refinement of Coding - Time-Space T		-		-	
Theta notation, P Abstraction	rogramming Style, Refinement of Coding - Time-Space T		-		ting,	Data
Theta notation, P Abstraction Module:2	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures	'rade	Off,	Test	ting, 4 h	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ae, Linked list and its types, Various Representations, Operation	'rade	Off,	Test	ting, 4 h	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ae, Linked list and its types, Various Representations, Operatives.	'rade	Off,	Test	4 h	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ae, Linked list and its types, Various Representations, Operation	'rade ations	Off,	Test Appli	4 h cation	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree,	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Operatives. Basic Non-Linear Data Structures , Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI	'rade ations	Off,	Test Appli	4 h cation 5 h ree).	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Operates. Basic Non-Linear Data Structures , Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI Advanced Non-Linear Data Structures	'rade ations L Tree	Off,	Test Appli ay Tr	4 h cation 5 h cee).	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4 Graphs (Directed,	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Operatives. Basic Non-Linear Data Structures , Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI	'rade ations L Tree	Off,	Test Appli ay Tr	4 h cation 5 h cee).	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4 Graphs (Directed, complexity analysis	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Operatives. Basic Non-Linear Data Structures , Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (search and ) & Applications of Non-Linear Data Structures	'rade ations L Tree	Off,	Test Appli ay Tr	4 h cation 5 h cee). 5 h	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4 Graphs (Directed, complexity analysis Module:5	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Opera- ires. Basic Non-Linear Data Structures Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (search and ) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures	'rade ations L Tree I trave	Off, s & 1 e, Spl ersal	Test Appli ay Tr algor	4 h cation 5 h cee). 5 h	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4 Graphs (Directed, complexity analysis Module:5 Sequential Search,	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Operatives. Basic Non-Linear Data Structures Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (search and ) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures Binary Search, Comparison Trees, Breadth First Search, Dep	ations L Tree l trave	Off, s & d e, Spl ersal	Test Appli ay Tr algor earch,	4 h cation 5 h cee). 5 h cithms 5 h	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4 Graphs (Directed, complexity analysis Module:5 Sequential Search, Sort, Selection Sort	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Opera- ires. Basic Non-Linear Data Structures Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (search and ) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures	ations L Tree l trave	Off, s & d e, Spl ersal	Test Appli ay Tr algor earch,	4 h cation 5 h cee). 5 h cithms 5 h	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4 Graphs (Directed, complexity analysis Module:5 Sequential Search, Sort, Selection Sort	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Operatives. Basic Non-Linear Data Structures Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (search and ) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures Binary Search, Comparison Trees, Breadth First Search, Dep	ations L Tree l trave	Off, s & d e, Spl ersal	Test Appli ay Tr algor earch,	4 h cation 5 h cee). 5 h cithms 5 h	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4 Graphs (Directed, complexity analysis Module:5 Sequential Search, Sort, Selection Sort to Hashing	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Operatives. Basic Non-Linear Data Structures Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (search and ) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures Binary Search, Comparison Trees, Breadth First Search, Dep	ations L Tree l trave	Off, s & d e, Spl ersal	Test Appli ay Tr algor earch,	4 h cation 5 h cee). 5 h ithms 5 h , Inset	Data
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4 Graphs (Directed, complexity analysis Module:5 Sequential Search, Sort, Selection Sort to Hashing Module:6	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Operators mes. Basic Non-Linear Data Structures , Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (search and ) & Applications of Non-Linear Data Structures Searching And Sorting On Data Structures Binary Search, Comparison Trees, Breadth First Search, Dep t, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort	ations L Tree d trave	Off, s & 1 e, Spl ersal rst Sc p So:	Test Appli ay Tr algor earch, rt, Int	4 h cation 5 h cee). 5 h cee). 5 h trodu 3 h	Data nours ns of nours s and ertion ction
Theta notation, P Abstraction Module:2 Array, Stack, Queu Linear Data Structu Module:3 Trees (Binary Tree, Module:4 Graphs (Directed, complexity analysis Module:5 Sequential Search, Sort, Selection Sort to Hashing Module:6	rogramming Style, Refinement of Coding - Time-Space T Linear Data Structures ue, Linked list and its types, Various Representations, Operators res. Basic Non-Linear Data Structures Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVI Advanced Non-Linear Data Structures Undirected), Various Representations, Operations (search and ) & Applications of Non-Linear Data Structures Binary Search, Comparison Trees, Breadth First Search, Dep t, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort File Organization	ations L Tree d trave	Off, s & 1 e, Spl ersal rst Sc p So:	Test Appli ay Tr algor earch, rt, Int	4 h cation 5 h cee). 5 h ithms 5 h ithms 5 h ithms 4 h	Data nours ns of nours s and ertion ction





Mo	dule:8	Contemporary Issues				2 hours		
Gue	est lecture by	Industry Experts or R&D organ	nization					
				Total	Lecture hours:	30 hours		
Tex	t Book(s)							
1.	E Horowi	tz and S Sahni, "Fundamentals o	of Data Struct	tures", Seco	ond Edition, Galg	otia Booksource,		
	2008.							
2.	Alfred V. Aho, John E. Hopperoft, Jeffrey D. Ullman, "Data Structures and Algorithms", First							
	Edition, Pearson Publishers, 1983.							
Ref	erence Bool	,						
1.		onald E, "Art of Compute	er Programm	ing: Fund	lamental Algorith	nms Volume 1		
	Fundamer	tal Algorithms", Third Edition,	Pearson Publ	ishers, 2011	1.			
2	_	H. Cormen, Charles E. Leiser				Introduction to		
		s", Third Edition, PHI Publishe		,	,			
3	8	, Open Data Structures: An In		Open Path	s to Enriched Le	arning). 31st ed.		
U		BC Press, 2013.	(	open ruur				
Mo	,	ation: CAT / Assignment / Q	uiz / FAT /	Project /	Seminar			
1010			uiz / 1111 /	110jeet /	oemmai			
Lie	t of Challon	ging Experiments (Indicative	<u>`</u>					
1.		f Hanoi using user defined stack						
2.		writing, and addition of polynon						
<u>2.</u> 3.		ors with line count, word count s		e screen				
<u> </u>		n all operations.		c sereen.				
	Graph alg	1						
5.								
5. 6.			re in/from a	file				
		etrieving non-linear data structu	re in/from a		boratory Hours	30 hours		
6.	Saving / 1			Total Lal	5	30 hours		
6. <b>Mo</b>	Saving / 1 de of Assess	etrieving non-linear data structu		Total Lal [] / Project	5	30 hours		



Course Code	Course Title	L	Т	Р	J	С
CBS1004	Computer Architecture and Organization	2	0	2	0	3
Pre-requisite	NIL	Sy	llabu	ıs ve	rsio	n
			V	r. 1.0		
Course Objectives:						
1. To provide knowledg	e on overview of IAS computer function and addressingmo	des.				
	are implementation of arithmetic unit to solve addition, sub	otrac	tion,	mult	iplica	ation
and division.						
3. To provide knowledge	ge of memory technologies, interfacing techniques and sub sy	vstem	n devi	ces.		
Expected Course Out						
	s on machine instructions and addressing modes.					
-	ious algorithms for computer arithmetic.					
	ance of various memory modules in memory hierarchy.					
4. Compare and contrast	st the features of I/O devices and parallel processors.					
5. Outline the evaluatio	n of memory organization.					
6. Analyse the performa	ance of Arithmetic logic unit, memory and CPU.					
	duction to Computer Architecture				4 h	ours
	computer: CPU, memory, input-output subsystems, control					
	ecture of a CPU: Registers, instruction execution cycle,			-		n of
instructions, addressing	g modes, instruction set. Outlining instruction sets of some c	omn	ion C	PUs	•	
Module:2 Data					2 1.	
	representation ntation, fixed and floating-point representations, character re		optot	on	<b>3</b> N	ours
Signed number represe	mation, fixed and floating-point representations, character re	pies	entau	.011.		
Module:3 Com	puter arithmetic				5 h	ours
	btraction, ripple carry adder, carry look-ahead adder, etc. mu	ıltipl	icatio	n – s		
0	carry save multiplier, etc. Division restoring and non-restor	-				
point arithmetic, IEEE		U		1	<i>.</i>	U
	control unit design				4 h	ours
Hardwired and micro-p	programmed design approaches, design of a simple hypothet	ical (	CPU.			
Memory system design	: Semiconductor memory technologies, memory organization	n.				
<b>_</b>	bheral devices and their characteristics	1 .		1		ours
	ns, I/O device interface, I/O transfers – program controlle			-		
, I 0	non-privileged instructions, software interrupts and exce	1		rogr	ams	and
processes – role of inte	errupts in process state transitions, I/O device interfaces – S0	JII, l	JSB.			
-	lining			T 4		ours
	lining, throughput and speedup, pipeline hazards. Parallel P	roce	ssors:	Intr	oau	Juon
to parallel processors, 0	Concurrent access to memory and cache coherency.					





	dule:7	Memory organization				3 hours
Men	nory interle	eaving, concept of hierarchic	al memory c	organization, ca	ache memory, ca	ache size vs. block
size,	, mapping f	unctions, replacement algorit	hms, write po	olicies.		
	dule:8	Contemporary issues				1 hour
Gue	est lecture b	y Industry Experts or R&D o	organization			
				Total Le	cture hours:	30 hours
Tex	t Book(s)					
1.	M. M. Ma	ano, Computer System Archi	tecture, 3rd e	ed., Prentice Ha	ull of India, 1993	
2.	David A	A. Patterson and John I	Hennessy	, Computer	Organization a	nd Design: The
	Hardware	e/Software Interface, 4 <sup>th</sup> Edit	tion, Elsevier	, 2012.		
3.	Carl Ha	macher, ZvonkoVranesic, S	SafwatZaky, 1	NaraigManjikia	n, Computer	Organization and
	Embedde	ed Systems, McGraw-Hill Pu	blishing, 2011	1		
Ref	erence Boo	le				
1.		Hayes, Computer Architectur	e and Organi	zation. McGray	w-Hill, 1998	
2.		Stallings, Computer Organiza				mance. 8 <sup>th</sup> Edition.
		Hall, 2006.			5 0	,,
Mod		ation: CAT / Assignment	/ Ouiz / FA	T / Project /	Seminar	
		,		, -,,		
List	of Challen	ging Experiments (Indica	tive)			
1.	Arithmetic	c Logic Unit				
2.	Memory I	Design				
3.	CPU Desi	gn				
4.	Combinat	ional Multipliers				
				Total Labo	oratory Hours	30 hours
Mod	le of Asses	sment: Assessments/ Mid	l Term Lab/	/ FAT / Proje	ct	
		d by Board of Studies	16-09-2019			
App	proved by A	Academic Council	No.56	Date	24-09-2019	



#### VIT® Vellore Institute of Technology

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Course code	Course Title	L	Τ	Р	J	С	
CBS1005	Software Engineering Methodologies	2	0	2	0	3	
Pre-requisite	NIL	Syllabus version		n			
		v. 1.0					
Course Objectives:							

#### 1. To introduce the fundamental concepts of Software development process.

- 2. To teach the concepts of system analysis and design for system requirement specification
- 3. To introduce the principles of Coding, Testing, documentation, and project Management

#### **Expected Course Outcome:**

- 1. Apply the system development life cycle for any Business system.
- 2. Establish software project management activities such as planning, scheduling and Estimation for the business system.
- 3. Specify the business requirements through appropriate system analysis and design.
- 4. Adapt good programming and documentation standards
- 5. Implement and demonstrate any business system software from specification to validation and verification.

#### Module:1 Introduction

Programming in the small vs. programming in the large; software project failures and importance of software quality and timely availability; of software engineering towards successful execution of large software projects; emergence of software\_engineering as a discipline, Software Engineering Historical Development from Jackson Structured Programming to Agile Development.

#### Module:2 Software Project Management

4 hours

4 hours

Basic concepts of life cycle models – different models and milestones; software project planning – identification of activities and resources; concepts of feasibility study; techniques for estimation of schedule and effort; software cost estimation models and concepts of software engineering economics; techniques of software project control and reporting; introduction to measurement of software size; introduction to the concepts of risk and its mitigation; configuration management.

#### Module:3 Software Quality Management and Reliability 4 hours

Software quality; Garvin's quality dimensions, McCall's quality factor, ISO 9126 quality factor; Software Quality Dilemma; Introduction to Capability Maturity Models (CMM and CMMI); Introduction to software reliability, reliability models and estimation.

#### Module:4Software Requirements Analysis, Design and Construction4 hours

Introduction to Software Requirements Specifications (SRS) and requirement elicitation techniques; techniques for requirement modelling – decision tables, event tables, state transition tables, Petri nets; requirements documentation through use cases; introduction to UML, introduction to software metrics and metrics-based control methods; measures of code and design quality.



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Module:5	Object Oriented Analysis, Design and Construction	4 hours
Concepts -1	he principles of abstraction, modularity, specification, encapsulation	and information
hiding; con	cepts of abstract data type; Class Responsibility Collaborator (CRC) r	model; quality of
design; desig	gn measurements; concepts of design patterns; Refactoring; object-orier	nted construction
principles; c	bject-oriented metrics.	
Module:6	Software Testing	4 hours
	n to faults and failures; basic testing concepts; concepts of verification	
	nd white box tests; white box test coverage - code coverage, condition	
-	sic concepts of black-box tests – equivalence classes, boundary value test	-
	ng use cases; transaction based testing; testing for non-functional require	
-	e and efficiency; concepts of inspection; Unit Testing, Integration	Testing, System
Testing and	Acceptance Testing.	
Module:7	Agile Software Engineering	4 hours
	6 6 6	
e	vare Engineering: Concepts of Agile Methods, Extreme Programmir	ng; Agile Process
Model - Scr	um, Feature; Scenarios and Stories.	
Module:8	Contemporary Issues	2 hours
Guest lectur	e by Industry Experts or R&D organization	1
	Total Lecture hours:	30 hours
Text Book		
	8. Pressman, Software engineering: a practitioner's approach, Palgrave	macmillan, 7 <sup>th</sup>
Edition	·	
Reference		M.I. ID.
	sentials of Modern Software Engineering: Free the Practices from the	
2	cobson, Harold "Bud" Lawson, Pan-Wei Ng, Paul E. McMahon and Mic erville, I. Software Engineering: Pearson New International Edition. Pear	
	I, $10^{\text{th}}$ Edition, 2017.	
	valuation: CAT / Assignment / Quiz / FAT / Project / Seminar	
Mode of L		
List of Cha	llenging Experiments (Indicative)	
	pment of requirements specification, function-oriented design using SA,	/\$D
	-oriented design using UML	/ 5D
,	e Design	
	nentation using C++ and testing	
-	8 8	anagement tools
	appropriate CASE tools and other tools such as configuration manalysis tools in the software life cycle.	anagement 10018,
Program	Total Laboratory Hours	30 hours
Mode of A	ssessment: Assessments/ Mid Term Lab/ FAT / Project	50 Hours
	led by Board of Studies 28-10-2021	
	y Academic Council No. 64 Date 16-12-2021	
1 pproved b	y readenine Council 10.04 Date 10-12-2021	



Course Code	Course Title	L	T	P	J	<u>C</u>
CBS1006	Principles of Operating Systems	2	0	2	0	3
Pre-requisite NIL Syllabus ve v. 1.0						on
Course Objectives:				V. 1.	0	
<ol> <li>To introduce the the OS services.</li> <li>To describe the</li> </ol>	e Operating system concepts and designs to provide the ski trade-offs between contradictory objectives in large scale OS knowledge for application of the various OS design issues and	syste	m de	esign.	mple	emen
Expected Course O	utcome:					
<u>.</u>	ious OS functionalities, structures and layers.					
	a calls related to OS management and interpreting different	stage	s of	variou	ıs pr	oces
3. Design CPU sch	eduling algorithms to meet and validate the scheduling criter	ia.				
4. Apply and explo	re the communication between inter process and synchronization	ation	tech	niques	5.	
5. Implement mem memory techniq	nory placement strategies, replacement algorithms related to	main	men	nory a	ınd v	irtua
, 1	e file systems; file allocation, access techniques along with vi	rtual	zatic		cont	c 0.0
	with protection and security enabled capabilities.	ituan	Zauc		icept	5 all
	with protection and security enabled capabilities.					
	* * *				31	011#
Module:1 Intro	oduction to OS and System Structure		f O	<u> </u>		nour
Module:1   Intro     Introduction:   Conc	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ				Ser	vices
Module:1     Intro       Introduction:     Conc       Interrupt handling and	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ ndSystem Calls, Basic architectural concepts of an OS, Cor				Ser	vices
Module:1     Intro       Introduction:     Conc       Interrupt handling and	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ				Ser	vices
Module:1     Intro       Introduction:     Conc       Interrupt handling and Resource Manager view	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ ndSystem Calls, Basic architectural concepts of an OS, Con ew, process view and hierarchical view of an OS.				Ser Mac	vices
Module:1IntroIntroduction:ConcInterrupt handling anResource Manager viModule:2Proo	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ ndSystem Calls, Basic architectural concepts of an OS, Cor ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms	icept	of V	7irtual	Ser Mac	vices chine nour
Module:1IntroIntroduction:ConcInterrupt handling atResource Manager viModule:2ProcProcesses:Definition	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ ndSystem Calls, Basic architectural concepts of an OS, Con ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I	Proce	of V	tate t	Ser Mac 6 I	vices chine <b>nour</b> tions
Module:1IntroIntroduction:ConcInterrupt handling atResource Manager viModule:2ProcProcesses:DefinitionProcess ControlBlock	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ ndSystem Calls, Basic architectural concepts of an OS, Cor ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I ock (PCB), Context switching. Process Scheduling: Fou	Proce	of V ss S ion	tate tand S	Ser Mac <u>6 1</u> ransi Schec	vices chine <b>nour</b> tions lulin
Module:1IntroIntroduction:ConcInterrupt handling atResource Manager viModule:2ProcProcesses:DefinitionProcess ControlBlaobjectives,Types	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ adSystem Calls, Basic architectural concepts of an OS, Con- ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I ock (PCB), Context switching. Process Scheduling: Fou E Schedulers, Scheduling criteria: CPU utilization, Throug	Proce	of V ss S ion Tur	tate tand Senarou	Ser Mac 6 I ransi Schec	vices chine nour tions luling Fime
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Module:1IntroIntroduction:ConcInterrupt handling atResource Manager viModule:2ProcProcesses:DefinitionProcess ControlBloobjectives,Types ofWaiting Time,Response	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ adSystem Calls, Basic architectural concepts of an OS, Con- ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I ock (PCB), Context switching. Process Scheduling: Fou E Schedulers, Scheduling criteria: CPU utilization, Throug	Proce	of V ss S ion Tur	tate tand Senarou	Ser Mac 6 I ransi Schec	vices chine <b>nour</b> tions luling Fime
Module:1       Intro         Introduction:       Conc         Interrupt handling and Resource Manager violation       Module:2         Module:2       Processes:         Processes:       Definition         Processes:       Control         Block       Block         Objectives,       Types         Waiting Time,       Response	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ adSystem Calls, Basic architectural concepts of an OS, Cor- ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I ock (PCB), Context switching. Process Scheduling: Fou Schedulers, Scheduling criteria: CPU utilization, Throug onse Time. Scheduling algorithms: Pre-emptive and non- cheduling: Real Time scheduling: RM and EDF.	Proce	of V ss S ion Tur	tate tand Senarou	Ser Mac 6 I ransi Schec ind ' CFS,	vices chine nour tions lulin Fime , SJF
Module:1IntroIntroduction:ConcInterrupt handling atResource Manager viModule:2ProcProcesses:DefinitionProcess ControlBloobjectives,Types ofWaiting Time,ResponseRR;Multiprocessor sModule:3Proc	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ ndSystem Calls, Basic architectural concepts of an OS, Cor- ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I ock (PCB), Context switching. Process Scheduling: Fou Schedulers, Scheduling criteria: CPU utilization, Throug onse Time. Scheduling algorithms: Pre-emptive and non- cheduling: Real Time scheduling: RM and EDF.	Proce Indat hput,	of V ss S ion Tur empt	virtual tate t and S marou ive, F	Ser Mac 6 I ransi Schec und CFS, 7 I	vices chine nour ttions lulin l'ime , SJF
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Module:1IntroIntroduction:ConcInterrupt handling andResource Manager viaModule:2ProceProcesses:DefinitionProcesses:DefinitionObjectives,Types ofWaiting Time,ResponseRR;Multiprocessor sModule:3ProceInter-processComConditions,MutualThe Producer / Con	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ adSystem Calls, Basic architectural concepts of an OS, Con- ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I ock (PCB), Context switching. Process Scheduling: Fou Schedulers, Scheduling algorithms: Pre-emptive and non- cheduling: Real Time scheduling: RM and EDF. cess Synchronization, Threads and Deadlocks munication: Concurrent processes, precedence graph Exclusion, Hardware Solution, Semaphores, Strict Alternat sumer Problem, Event Counters, Monitors, Message Passing	Proce Indat hput, pre-o s,Crit ion, ;, Cla	of V ss S ion Tur empt ical Pete	virtual tate t and S marou ive, F Secti rson's	Ser Mac 6 I ransi Schec ind ' CFS, 7 I on, Solu Prob	vice chino noun tion lulin lulin lulin Gimo Rac ution
Module:1IntroIntroduction:ConcInterrupt handling atResource Manager viModule:2ProcProcesses:DefinitionProcesses:DefinitionObjectives,Types ofWaiting Time,ResponseRR;Multiprocessor sModule:3ProcInter-processComConditions,MutualThe Producer / ConReader's & Writer	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ adSystem Calls, Basic architectural concepts of an OS, Cor- ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I ock (PCB), Context switching. Process Scheduling: Fou Schedulers, Scheduling criteria: CPU utilization, Throug onse Time. Scheduling algorithms: Pre-emptive and non- cheduling: Real Time scheduling: RM and EDF. cess Synchronization, Threads and Deadlocks munication: Concurrent processes, precedence graph Exclusion, Hardware Solution, Semaphores, Strict Alternat sumer Problem, Event Counters, Monitors, Message Passing Problem, Dinning Philosopher Problem, Barber's shop	Proce undat hput, pre-o s,Criti ion, ;, Cla	of V ss S ion Tur empt ical Peter ssical	virtual tate t and S marou ive, F Secti rson's IPC n. <b>Co</b>	Ser Mac 6 I ransi Schec ind ' CFS, 7 I on, Solu Prob	vice: chind nour tion: lulin lulin Timo , SJI Rac utior lucin Rac
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Module:1       Introduction:         Interrupt handling at         Resource Manager vi         Module:2       Proc         Processes:       Definition         Processes:       Definition         Objectives, Types of       Waiting Time, Response         Module:3       Processor s         Module:3       Process         Inter-process       Com         Conditions, Mutual       The Producer / Com         Reader's & Writer       Programming: Critic         sequential process (Communication)       Condition	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ adSystem Calls, Basic architectural concepts of an OS, Cor- ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I ock (PCB), Context switching. Process Scheduling: Fou Schedulers, Scheduling criteria: CPU utilization, Throug onse Time. Scheduling algorithms: Pre-emptive and non- cheduling: Real Time scheduling: RM and EDF. cess Synchronization, Threads and Deadlocks munication: Concurrent processes, precedence graph Exclusion, Hardware Solution, Semaphores, Strict Alternat sumer Problem, Event Counters, Monitors, Message Passing Problem, Dinning Philosopher Problem, Barber's shop cal region, conditional critical region, monitors, concurrent I SP); Deadlocks - prevention, avoidance, detection and recor	Proce Indat hput, pre-o s,Crit ion, j, Cla o pro angua very.	of V ss S ion Tur empt ical Peter ssical obler ages, <b>Thr</b>	/irtual tate t and S marou ive, F Secti rson's I IPC n. <b>Co</b> comm ead: I	Ser Mac 6 I ransi Schec ind ' CFS, 7 I on, Solu Prob Defin	vice chino noun tion lulin lulin lulin fimo SJI Rac ution lem <b>rrer</b> catin
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Module:1IntroIntroduction:ConcInterrupt handling andResource Manager viaModule:2ProceProcesses:DefinitionProcesses:DefinitionObjectives, Types ofWaiting Time, ResponseRR; Multiprocessor sModule:3ProceInter-processConditions, MutualThe Producer / ConReader's & WriterProgramming:CriticSequential process (C)Various states, Bene	oduction to OS and System Structure ept of Operating Systems (OS), Generations of OS, Typ adSystem Calls, Basic architectural concepts of an OS, Cor- ew, process view and hierarchical view of an OS. cess Management and Scheduling Algorithms on, Process Relationship, Different states of a Process, I ock (PCB), Context switching. Process Scheduling: Fou Schedulers, Scheduling criteria: CPU utilization, Throug onse Time. Scheduling algorithms: Pre-emptive and non- cheduling: Real Time scheduling: RM and EDF. cess Synchronization, Threads and Deadlocks munication: Concurrent processes, precedence graph Exclusion, Hardware Solution, Semaphores, Strict Alternat sumer Problem, Event Counters, Monitors, Message Passing Problem, Dinning Philosopher Problem, Barber's shop cal region, conditional critical region, monitors, concurrent I SP); Deadlocks - prevention, avoidance, detection and recor	Proce Indat hput, pre-o s,Criti ion, ;, Cla o pro angua very. . <b>De</b>	of V ss S ion Tur empt ical Peter ssical obler ages, <b>Thr</b> adlo	Virtual tate t and S marou ive, F Secti rson's I IPC n. Co comm ead: I cks: I	Ser Mac 61 ransi Schec ind CFS, 71 on, 71 on, Solu Prob oncu nunic Defin	vice chino noun tion lulin lulin fimo sJI Rac ution lem rrer catin ition



### VIIT<sup>®</sup> Vellore Institute of Technology

CURRICULUM (2022 - 2023)

	dule:4 Memory Management	6 hour
	mory Management: Basic concept, Logical and Physical address maps, N	
	ntiguous Memory allocation – Fixed and variable partition– Internal and External	
	npaction.Virtual Memory: Basics of Virtual Memory – Hardware and control struc	0
	erence, Page allocation, Partitioning, Paging, Page fault, Working Set, Segmentation	
	e Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC).	100
	(U) and Least Recently used (LRU).	, Not recently use
(111	(C) and Least Recently used (LRO).	
Mo	dule:5 File Systems Management and Implementation	2 hour
File	e Management: Concept of File, Access methods, File types, File operation, Direc	ctory structure, Fil
Syst	tem structure, Allocation methods (contiguous, linked, indexed), Free-space manage	gement (bit vector
link	ed list, grouping), directory implementation (linear list, hash table), efficiency and per	rformance.
Mo	dule:6 I/O and Device Management	2 hour
I/C	D Hardware: I/O devices, Device controllers, Direct Memory Access, Principle	es of I/O. Dis
Ma	nagement: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Di	isk reliability, Dis
forr	natting, Boot-block, Bad blocks.	
	dule:7 Case Study	2 hour
Cas	se study: UNIX OS file system, shell, filters, shell programming, programming with	n the standard I/C
		i une standard 1/ e
	IX system calls.	
UN	· · · · · · · · · · · · · · · · · · ·	
UN Mo	dule:8 Contemporary Issues	2 hour
UN Mo	dule:8     Contemporary Issues       est lecture by Industry Experts or R&D organization	2 hour
UN Mo Gue	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:	2 hour
UN Mo Gua	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         kt Book(s)       Total Lecture hours:	2 hour 30 hour
UN Mo Gue	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         Kt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V	2 hour 30 hour
UN Mo Gua Tex 1.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         xt Book(s)       Total Lecture hours:         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V 2019.	<b>2 hour 30 hour</b> Wiley, 10 <sup>th</sup> Edition
UN Mo Gua	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         xt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V         2019.       Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design and V	<b>2 hour 30 hour</b> Wiley, 10 <sup>th</sup> Edition
UN <b>Mo</b> Gue <b>Tex</b> 1. 2.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         xt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, 2019.         Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design an Vol. 68. Englewood Cliffs: Prentice Hall, 1997.	<b>2 hour 30 hour</b> Wiley, 10 <sup>th</sup> Edition
UN Gua Tex 1. 2. Ref	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         xt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V 2019.         Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design an Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Gerence Book(s)	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition and implementation
UN <b>Mo</b> Gue <b>Tex</b> 1. 2.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         xt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, Vol. 2019.         Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design and Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Ference Book(s)         Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Operating System	<b>2 hour 30 hour</b> Wiley, 10 <sup>th</sup> Edition
UN Mo Gua Tex 1. 2. Ref 1.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         xt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V 2019.         Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design and Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Serence Book(s)         Remzi       H. Arpaci-Dusseau, Andrea       C. Arpaci-Dusseau, Operating System Sys	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition and implementation ems, Three Eas
UN Gua Tex 1. 2. Ref	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         xt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, 2019.         Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design an Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Ference Book(s)         Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Operating System Pieces, Arpaci-Dusseau Books, Inc, 2015.         Dhamdhere, Dhananjay M. Operating systems: a concept-based approach, 2E.	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition and implementation ems, Three Eas
UN Mo Gua Tex 1. 2. Ref 1. 2.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization         Total Lecture hours:         tt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V         2019.         Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design an         Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Ference Book(s)         Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Operating System         Pieces,Arpaci-Dusseau Books, Inc, 2015.         Dhamdhere, Dhananjay M. Operating systems: a concept-based approach, 2E.         Education, 2006.	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition and implementation ems, Three Eas Tata McGraw-Hi
UN Mo Gua Tex 1. 2. Ref 1.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V         2019.       Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design and Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Ference Book(s)         Remzi       H. Arpaci-Dusseau, Andrea       C. Arpaci-Dusseau, Operating System         Pieces,Arpaci-Dusseau Books, Inc, 2015.       Dhamdhere, Dhananjay M. Operating systems: a concept-based approach, 2E.         Education, 2006.       Deitel, Harvey M., Paul J. Deitel, and David R. Choffnes. Operating system	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition and implementation ems, Three Eas Tata McGraw-Hi
UN Mo Gua Tex 1. 2. Ref 1. 2.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization         Total Lecture hours:         tt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V         2019.         Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design an         Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Ference Book(s)         Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Operating System         Pieces,Arpaci-Dusseau Books, Inc, 2015.         Dhamdhere, Dhananjay M. Operating systems: a concept-based approach, 2E.         Education, 2006.	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition and implementation ems, Three Eas Tata McGraw-Hi
UN Mo Gua Tex 1. 2. Ref 1. 2.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V         2019.       Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design and Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Ference Book(s)         Remzi       H. Arpaci-Dusseau, Andrea       C. Arpaci-Dusseau, Operating System         Pieces,Arpaci-Dusseau Books, Inc, 2015.       Dhamdhere, Dhananjay M. Operating systems: a concept-based approach, 2E.         Education, 2006.       Deitel, Harvey M., Paul J. Deitel, and David R. Choffnes. Operating system	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition Mind implementation ems, Three Eas Tata McGraw-Hi ns. Delhi. Pearso
UN Mo Gua Tex 1. 2. Ref 1. 2. 3. 4.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         xt Book(s)         Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, V         2019.       Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design an         Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Ference Book(s)         Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Operating System         Pieces, Arpaci-Dusseau Books, Inc, 2015.         Dhamdhere, Dhananjay M. Operating systems: a concept-based approach, 2E.         Education, 2006.         Deitel, Harvey M., Paul J. Deitel, and David R. Choffnes. Operating system         Education: Dorling Kindersley, 2004.	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition Mind implementation ems, Three Eas Tata McGraw-Hi ns. Delhi. Pearso
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UN Mo Gua Tex 1. 2. Ref 1. 2. 3. 4. Mo List	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         xt Book(s)       Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, 2019.         Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design ar Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Ference Book(s)         Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Operating System Pieces, Arpaci-Dusseau Books, Inc, 2015.         Dhamdhere, Dhananjay M. Operating systems: a concept-based approach, 2E. Education, 2006.         Deitel, Harvey M., Paul J. Deitel, and David R. Choffnes. Operating system Education: Dorling Kindersley, 2004.         Milenkovič, Milan. Operating systems: concepts and design. McGraw-Hill, Inc., 19         de of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar         t of Challenging Experiments (Indicative)	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition ad implementation ems, Three Eas Tata McGraw-Hi ns. Delhi. Pearson 087.
UN Mo Gua Tex 1. 2. Ref 1. 2. 3. 4. Mo	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         total Lecture hours:         Contemporary Issues         Total Lecture hours:         Contemporary Issues         Total Lecture hours:         Contemporary Issues         Study of Linux commands – System Information, Files and Directories, Process, T	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition ad implementation ems, Three Eas Tata McGraw-Hi ns. Delhi. Pearson 087.
UN Mo Gua Tex 1. 2. Ref 1. 2. 3. 4. Mo List 1.	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         t Book(s)       Abraham Silberschatz, Peter B. Galvin, Greg Gagne-Operating System Concepts, 2019.         Tanenbaum, Andrew S., and Albert S. Woodhull. Operating systems: design ar Vol. 68. Englewood Cliffs: Prentice Hall, 1997.         Ference Book(s)         Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Operating System Pieces, Arpaci-Dusseau Books, Inc, 2015.         Dhamdhere, Dhananjay M. Operating systems: a concept-based approach, 2E. Education, 2006.         Deitel, Harvey M., Paul J. Deitel, and David R. Choffnes. Operating system Education: Dorling Kindersley, 2004.         Milenkovič, Milan. Operating systems: concepts and design. McGraw-Hill, Inc., 19         de of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar         t of Challenging Experiments (Indicative)         Study of Linux commands – System Information, Files and Directories, Process, T and Scripting, Programming.	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition ad implementation ems, Three Eas Tata McGraw-Hi ns. Delhi. Pearson 087.
UN Mo Gua Tex 1. 2. Ref 1. 2. 3. 4. Mo List	dule:8       Contemporary Issues         est lecture by Industry Experts or R&D organization       Total Lecture hours:         Total Lecture hours:         total Lecture hours:         Contemporary Issues         Total Lecture hours:         Contemporary Issues         Total Lecture hours:         Contemporary Issues         Study of Linux commands – System Information, Files and Directories, Process, T	2 hour 30 hour Wiley, 10 <sup>th</sup> Edition and implementation ems, Three Eas Tata McGraw-Hi ns. Delhi. Pearso 287. Fext Processing





4.	CPU Scheduling Algorithms (FCFS, S	SJF, RR, Priority)				
5.	5. Deadlock Avoidance Algorithm (Bankers algorithm)					
6.						
7.						
8.	8. Dynamic Memory Allocation Algorithms (First fit, Best fit, Worst fit)					
9.						
10.	Disk Scheduling Algorithms.					
			Tot	al Laboratory Hours: 30 hours		
Mod	Mode of Assessment: Assessments/ Mid Term Lab/ FAT / Project					
Rec	Recommended by Board of Studies 16-09-2020					
App	roved by Academic Council	No. 59	Date	24-09-2020		



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	Course Title	L	Τ	Р	J	С
CBS1007	Database Systems	2	0	2	0	3
Pre-requisite	NIL		Sylla	bus v	resion	n
				v. 1.0	)	
Course Objectives:		1				
-	quaint students the significance of Database design		0			
-	e students with concepts of good database desig	gn and norm	alızat	ion o	t rela	tiona
schemas.						
3. To teach student	s the different concurrency control and recovery te	chniques for	transa	iction	s.	
Europeted Course O	)toomo:					
Expected Course O	inderstanding of the architecture and functioning o	f database ma	nacer	nent	vetem	16
	act an ER model and derive the relational schemas		0		system	15.
•	y the principles and practices of good database des		101.			
	s of data normalization to analyse, measure and eva	-	Ormai	nce of	f a dat	ahas
application.	, or cata normalization to analyse, measure and eva	male the peri	Jina		i a uat	
11	nd revoke privileges and comprehend database reco	overv technia	nes			
	nt SQL queries to retrieve and manipulate data as r		ues.			
o. Construct efficien	in ogn quenes to retreve and manipulate data as r	equirea.				
Module:1 Intro	oduction				31	nour
	uction to Database. Hierarchical, Network and R	elational Mo	dels.	Datab		
						/
architechire llata Al	hstraction Data Independence Data Definition L	anouage (DD	D	ata M		latio
	bstraction, Data Independence, Data Definition La	anguage (DD	L), D	ata M		latio
Language (DML).	bstraction, Data Independence, Data Definition La	anguage (DD	L), D	ata M		latio
Language (DML).	bstraction, Data Independence, Data Definition La	anguage (DD	L), D	ata M	anipu	
Language (DML). Module:2 Data	a Models				anipul 4 ł	nour
Language (DML). Module:2 Data Entity-relationship m	<b>a Models</b> nodel, network model, relational and object-oriente				anipul 4 ł	nour
Language (DML). Module:2 Data	<b>a Models</b> nodel, network model, relational and object-oriente				anipul 4 ł	nour
Language (DML). Module:2 Data Entity-relationship m data manipulation op	<b>a Models</b> nodel, network model, relational and object-oriente				anipul 4 I constr	nour
Language (DML). Module:2 Data Entity-relationship m data manipulation op Module:3 Rela	<b>a Models</b> nodel, network model, relational and object-oriente perations.	d data model	s, inte	grity	4 l constr	nour caints
Language (DML). Module:2 Data Entity-relationship m data manipulation op Module:3 Rela Relational database d	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages	d data model	s, inte	grity	4 l constr	nour caints
Language (DML). Module:2 Data Entity-relationship m data manipulation op Module:3 Rela Relational database d Normal forms, Depe	<b>a Models</b> nodel, network model, relational and object-oriente perations. <b>ational database design and Query languages</b> design: Domain and data dependency, Armstrong's	d data model s axioms, Fun	s, inte	grity al De	4 1 constr 6 1 pende	nour caints nour ncies
Language (DML).         Module:2       Data         Entity-relationship m         data manipulation op         Module:3       Rela         Relational database d         Normal forms, Depe         Relational query lang	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design.	d data model s axioms, Fun lational calcu	s, inte	grity al Dej QL3,	4 1 constr 6 1 pende	nour caints nour ncies
Language (DML).         Module:2       Data         Entity-relationship m         data manipulation op         Module:3       Rela         Relational database d         Normal forms, Depe         Relational query lang	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re	d data model s axioms, Fun lational calcu	s, inte	grity al Dej QL3,	4 1 constr 6 1 pende	nour caints nour ncies
Language (DML).         Module:2       Data         Entity-relationship m         data manipulation op         Module:3       Rela         Relational database d         Normal forms, Depe         Relational query lang         DML constructs, Op         Module:4       Que	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re pen source and Commercial DBMS - MYSQL, OR/ ery processing and Optimization	d data model s axioms, Fun lational calcu ACLE, DB2, 5	s, inte	grity al De QL3, server	4 h constr 6 h pende:	nour nour ncies
Language (DML).         Module:2       Data         Entity-relationship mediata manipulation op         data manipulation op         Module:3       Rela         Relational database of         Normal forms, Depe         Relational query lang         DML constructs, Op         Module:4       Que         Evaluation of relati	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re pen source and Commercial DBMS - MYSQL, OR/	d data model s axioms, Fun lational calcu ACLE, DB2, 5	s, inte	grity al De QL3, server	4 h constr 6 h pende:	nour raints nour ncies
Language (DML).         Module:2       Data         Entity-relationship m         data manipulation op         Module:3       Rela         Relational database d         Normal forms, Depe         Relational query lang         DML constructs, Op         Module:4       Que	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re pen source and Commercial DBMS - MYSQL, OR/ ery processing and Optimization	d data model s axioms, Fun lational calcu ACLE, DB2, 5	s, inte	grity al De QL3, server	4 h constr 6 h pende:	nour raints nour ncies
Language (DML).         Module:2       Data         Entity-relationship m         data manipulation op         Module:3       Rela         Relational database d         Normal forms, Depe         Relational query lang         DML constructs, Op         Module:4       Que         Evaluation of relatian         algorithms.	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re pen source and Commercial DBMS - MYSQL, OR/ ery processing and Optimization onal algebra expressions, Query equivalence, Jo	d data model s axioms, Fun lational calcu ACLE, DB2, 5	s, inte	grity al De QL3, server	4 h constr 6 h pende:	nour raints nour ncies
Language (DML).Module:2DataEntity-relationship mdata manipulation opModule:3RelaRelational database dNormal forms, DepeRelational query langDML constructs, OpModule:4QueEvaluation of relatialgorithms.Module:5Tran	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re pen source and Commercial DBMS - MYSQL, OR/ ery processing and Optimization onal algebra expressions, Query equivalence, Jonan et algebra et	d data model s axioms, Fun lational calcu ACLE, DB2, S Din strategies	s, inte	grity al De QL3, server ery o	4 1 constr 6 1 pende:	nour raints nour nour anour rour
Language (DML).         Module:2       Data         Entity-relationship m         data manipulation op         Module:3       Rela         Relational database d         Normal forms, Depe         Relational query lang         DML constructs, Op         Module:4       Que         Evaluation of relational         algorithms.         Module:5       Trant         Concurrency control	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re pen source and Commercial DBMS - MYSQL, OR/ ery processing and Optimization onal algebra expressions, Query equivalence, Jo nsaction Processing ol, ACID property, Serializability of schedulin	d data model s axioms, Fun lational calcu ACLE, DB2, s oin strategies g, Locking	s, inte	grity al De QL3, server ery o	4 1 constr 6 1 pende:	nour raints nour nour anour rour
Language (DML).         Module:2       Data         Entity-relationship m         data manipulation op         Module:3       Rela         Relational database d         Normal forms, Depe         Relational query lang         DML constructs, Op         Module:4       Que         Evaluation of relational         algorithms.         Module:5       Trant         Concurrency control	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re pen source and Commercial DBMS - MYSQL, OR/ ery processing and Optimization onal algebra expressions, Query equivalence, Jonan et algebra et	d data model s axioms, Fun lational calcu ACLE, DB2, s oin strategies g, Locking	s, inte	grity al De QL3, server ery o	4 1 constr 6 1 pende:	nour raints nour nour anour rour
Language (DML).         Module:2       Data         Entity-relationship m         data manipulation op         Module:3       Rela         Relational database d         Normal forms, Depe         Relational query lang         DML constructs, Op         Module:4       Que         Evaluation of relatianal         algorithms.         Module:5       Trans         Concurrency controps         schedulers, multi-vers	a Models nodel, network model, relational and object-oriented perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re- pen source and Commercial DBMS - MYSQL, OR/ ery processing and Optimization onal algebra expressions, Query equivalence, Jo nsaction Processing ol, ACID property, Serializability of schedulin sion and optimistic Concurrency Control schemes,	d data model s axioms, Fun lational calcu ACLE, DB2, s oin strategies g, Locking	s, inte	grity al De QL3, server ery o	4 1 constr 6 1 pende DDI	nour raints nour ncies an nour zatio
Language (DML).         Module:2       Data         Entity-relationship mediata manipulation op         Module:3       Relational database of         Module:3       Relata         Relational database of       Normal forms, Depe         Relational query lang       DML constructs, Op         Module:4       Que         Evaluation of relational gorithms.       Trans         Module:5       Trans         Concurrency controps       Schedulers, multi-vers         Module:6       Data	a Models nodel, network model, relational and object-oriente perations. ational database design and Query languages design: Domain and data dependency, Armstrong's endency preservation, Lossless design. guages: Relational algebra, Tuple and domain re pen source and Commercial DBMS - MYSQL, OR/ ery processing and Optimization onal algebra expressions, Query equivalence, Jo nsaction Processing ol, ACID property, Serializability of schedulin	d data model s axioms, Fun lational calcu ACLE, DB2, 3 pin strategies g, Locking Database rec	s, inte	grity al Dej QL3, server ery o times	4 H constr 6 H pende: DDI 4 H ptimiz 6 H tamp-1	nour nour ncies 2 and nour zation





	lule:7	Advanced Topics				2 hours
		d and object relational data	bases, Logical dat	abases, We	eb databases, D	Distributed databases,
Data	warehous	ing and data mining.				
Mod	lule:8	Contemporary Issues				1 Hour
		by Industry Experts or R&D	organization			111001
Gue			organization	Total Lo	cture hours:	30 hours
Mod	le of Eval	uation: CAT / Assignmer	nt / Ouiz / FAT			50 110013
	t Book(s)			110,0007		
1.	,	natz, A., Korth, H. F., and	d Sudarshan, S. I	Database S	vstem Concept	ts, McGraw-Hill, 7 <sup>th</sup>
	Edition.		,		1	, ,
2.	Ponniah	, P. Data warehousing func	lamentals for IT p	orofessiona	ls. John Wiley	& Sons, 2 <sup>nd</sup> Edition,
	2012.		Ĩ		5	
3.	Berson,	A., & Smith, S. J. Data ware	housing, data mini	ng, and OI	LAP. McGraw-	Hill, Inc., 2017.
4.		R., &Navathe, S. B. Fur				
		ng Edition, 2017.				
Refe	erence Bo	oks				
1.	Majumd	ar, A. K., and Bhattacharyya	, P. Database Man	agement S	ystems. McGrav	w-Hill, 2017.
2.	Raghu R	amakrishnan, Database Mar	nagement Systems,	Mcgraw-H	Hill,4th edition,	2015
List		nging Experiments (India	,			
1	Data De using SQ	finition Language, Data Mai	nipulation Languag	ge and Data	a Control Langi	uage commands
2	0	ith and without Constraint	name			
3		al Algebra – Select, Project,		n Set diffe	rence Join Ca	rtesian Product
4	Normaliz	0	emon, merseedor	ii, bet uiite	renee , join, ca	itesian i roduet
5	PL/SQL					
6	SQL inje					
7	- /	riented and object relational	databases			
1		nonted and object relational		tal Labora	atory Hours:	30 hours
Mod	le of Asse	ssment: Assessments/ M			2	50 110415
		ed by Board of Studies	16-09-2020	, ,		
		Academic Council	No. 59	Date	24-09-2020	



Course Code	Course Title	L	Т	Р	J	C
CBS1008	Operations Research	2	0	2	0	3
Pre-requisite	NIL		Syllabu	is Vo	ersio	n
			1	v. 1.0		
Course Objectives						
The course is aimed		rina Enain				
1	hasizes the application of Operations Research for sol	ving Engin	eering	proble	ems.	
	meaning, purpose, and tools of Operations Research.				- 11	
	e a problem, identify, formulate and solve problem	is in any e	ngineer	ring t	iela i	18111
-	rch principles, considering current and future trends.			1 1		
	e expected to know and understand common and impo	8		-		
	velop problem modeling and solving skills and learn l	how to mal	ke intel	llıgent	decis	sion
-	of view of optimization.					
	ill use optimization techniques to enhance systems an	d to manag	ge enter	rprise	resou	urce
using current too	ols, frameworks and reusable resources.					
Expected Course (						
	ourse, the student will be able to					
	ns research techniques like L.P.P, scheduling and sequ	iencing in i	ndustr	ial op	timiz	atio
problems.						
2. Solve allocation	problems using various OR methods.					
3. Analyze various	OR models like Inventory, Replacement, Queuing, I	Decision et	c., and	apply	then	n fo
3. Analyze various optimization.		Decision et	c., and	apply	then	n fo
optimization.		Decision et	c., and	apply	then	n fo
optimization. 4. Understand the	OR models like Inventory, Replacement, Queuing, I					
optimization. 4. Understand the	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera					
optimization. 4. Understand the 5. Gain knowledge applications in in	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera ndustries.				e rang	ge c
optimization. 4. Understand the 5. Gain knowledge applications in in Module:1 Li	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera ndustries.	tions Resea	urch in	a wide	e ranş 7 h	ge c
optimization. 4. Understand the 5. Gain knowledge applications in in Module:1 Li An overview and	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera ndustries. inear Programming Problems scope of Operations Research and Introduction	tions Resea	Progra	a wid	e ranį 7 h ng (L	ge o out P)
optimization. 4. Understand the 5. Gain knowledge applications in in Module:1 Li An overview and Illustration of LP Pr	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera ndustries. inear Programming Problems scope of Operations Research and Introduction roblems - Formulation exercises on LP Problems - Gr	tions Resea	Progra	a wide	e ranş 7 h ng (I ring I	ge c our .P) .PP
optimization. 4. Understand the 5. Gain knowledge applications in in Module:1 Li An overview and Illustration of LP Pri Simplex Method –	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera ndustries. inear Programming Problems scope of Operations Research and Introduction roblems - Formulation exercises on LP Problems - Ge Unboundedness - Multiple Optimum Solutions - De	tions Resea	Progra	a wide	e ranş 7 h ng (I ring I	ge o out .P) .PP
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optimization. 4. Understand the 5. Gain knowledge applications in in Module:1 Li An overview and Illustration of LP Pr Simplex Method – Artificial Variables : Module:2 Sp Formulation of Tran Problems.	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera ndustries. inear Programming Problems scope of Operations Research and Introduction roblems - Formulation exercises on LP Problems - Ge Unboundedness - Multiple Optimum Solutions - De Big-M Method - Sensitivity Analysis. pecial Types of Linear Programming Problems nsportation Problems - Sensitivity Analysis in Transp	tions Resea to Linear raphical Me generacy ar	Progra ethod o nd Cycl	a wide	e rang 7 h ng (I Proble 5 h ssign	ge c our .P) .PP cms our mer
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optimization. 4. Understand the 5. Gain knowledge applications in ir Module:1 Li An overview and Illustration of LP Pr Simplex Method – Artificial Variables : Module:2 Sp Formulation of Trat Problems. Module:3 In Formulation, Cuttin	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera ndustries. inear Programming Problems scope of Operations Research and Introduction roblems - Formulation exercises on LP Problems - Gr Unboundedness - Multiple Optimum Solutions - De Big-M Method - Sensitivity Analysis. pecial Types of Linear Programming Problems nsportation Problems - Sensitivity Analysis in Transportation metger Programming Problems	tions Resea	Progra ethod o nd Cycl	a wide	e rang 7 h ng (I Proble 5 h ssign	ge ( oui .P) .PP ems oui mer
optimization. 4. Understand the 5. Gain knowledge applications in ir Module:1 Li An overview and Illustration of LP Pr Simplex Method – Artificial Variables : Module:2 Sp Formulation of Trat Problems. Module:3 In Formulation, Cuttin Module:4 G	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera ndustries. inear Programming Problems scope of Operations Research and Introduction roblems - Formulation exercises on LP Problems - Ge Unboundedness - Multiple Optimum Solutions - De Big-M Method - Sensitivity Analysis. pecial Types of Linear Programming Problems nsportation Problems - Sensitivity Analysis in Transp metger Programming Problems g Plane Method - Branch and Bound Method – Applie oal Programming Problems	tions Resea	Progra ethod o nd Cycl	a wide	e rang 7 h ng (I Proble 5 h ssign	ge c our .P) .PP cms our mer
optimization. 4. Understand the 5. Gain knowledge applications in ir Module:1 Li An overview and Illustration of LP Pr Simplex Method – Artificial Variables : Module:2 Sp Formulation of Tra Problems. Module:3 In Formulation, Cuttin Module:4 Go Single and Multiple	OR models like Inventory, Replacement, Queuing, I concepts of integer linear programming. e on current topics and advanced techniques of Opera ndustries. inear Programming Problems scope of Operations Research and Introduction roblems - Formulation exercises on LP Problems - Ge Unboundedness - Multiple Optimum Solutions - De Big-M Method - Sensitivity Analysis. pecial Types of Linear Programming Problems nsportation Problems - Sensitivity Analysis in Transp metger Programming Problems g Plane Method - Branch and Bound Method – Applie oal Programming Problems	tions Resea	Progra ethod o nd Cycl	a wide	e rang 7 h ng (I ring I Proble 5 h ssigni 4 h	ge c out .P) .PP ems out



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Mod	lule:6	Game Theory				5 hours
Intro	oduction -	Characteristics of Game	Theory - Two	Person, Ze	ero sum games - Pure	strategy -
Don	ninance the	eory - Mixed strategies - Alg	ebraic and graph	ical methods		
	lule:7	Contemporary issues				2 hours
Indu	istry Exper	t Lecture				
			Total	Lecture hou	145	30 hours
						00 110 410
Text	t Book(s)					
1.	Kanti Sw	arup, Gupta P.K., and Man	mohan, (2008), (	Operations R	esearch, S. Chand & son	s.
Refe	erence Bo	1 1		1	· · · · · · · · · · · · · · · · · · ·	
1.	Hamdy 7	Taha, (1999), Operations Res	search, PHI.			
2.	S.D.Shar	ma, (2006), Operations Rese	earch , Kedaman	th Ramnath	& Co.	
3.		Gupta, (2001), Operations				
4.		elvan. R. (2006), Operation			dia Pvt Ltd.	
Mod	le of Eval	uation : Digital Assignment	s (Solutions by ι	ising soft skil	lls), Continuous Assessm	ent Tests,
Quiz	z, Final Ass	sessment Test.				
List	of Challer	nging Experiments (Indic	cative)			
1.	Introduc	tion to the software (R/LI	NGO/CPLEX/	any suitable	software packages) and	2 hours
	general S	yntaxes				
2.	Plotting a	and visualizing curves and su	urfaces – Symbo	lic computati	ions	2 hours
3.	Evaluatin	ng LPP using Simplex Metho	od			2 hours
4.	Evaluatin	ng LPP using Big M Method	and Sensitivity	Analysis		2 hours
5.	Evaluatin	ng Transportation Problems	and Sensitivity	Analysis in Tr	ransportation Problems	2 hours
6.	Evaluatin	ng Assignment Problems				2 hours
7.	Evaluatin	ng Integer Programming Pro	oblems			2 hours
8.		ng problems about transitior		d steady-stat	e probabilities	2 hours
9.		ng problems about Game th	-		-	2 hours
10.		optimization techniques to	5	ems		2 hours
	0		<b>1</b>		otal Laboratory Hours	20 hours
					<b>.</b>	·
		uation: Weekly Assessme		ssment Tes	t	
Reco		d by Board of Studies	16-09-2020 No. 59			
		Academic Council		Date	24-09-2020	



# Vellore Institute of Technology

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Course Code	Course Title	L	Τ	Р	J	С
CBS1009	Computational Statistics	2	0	2	0	3
Pre-requisite	NIL	Syl	labu	s Ve	ersio	n
				v. 1	.0	
Course Objectives	•					

#### **Course Objectives:**

- 1. This course Introduce and understand modern computational methods used in statistics. Included are methods for simulation, estimation and visualization of statistical data. Understand the role of computation as a tool of discovery in data analysis.
- 2. This enables the students to understand and use the applications of statistics in the real-time problems.
- 3. The aim of this course is to give graduate students a solid foundation of computational statistics, which they will use in other courses and their research. This course introduces some computational methods in statistics with emphasis on the usage of statistical software packages, statistical simulation, numerical methods, and related topics.

#### **Expected Course Outcome:**

- At the end of the course the student should be able to: 1.
- 2. Analyse and interpret statistical data using multivariate normal distributions.
- 3. Learn the approaches to point estimation of parameters.
- 4. Understand the concept of multivariate regression, by using multivariate analysis and interpreting experimental data.
- Understand the concept of statistical analysis. 5.
- 6. Learn about the data aggregation, group operations and time series.

#### Module:1 **Multivariate Normal Distribution**

5 hours

5 hours

Multivariate Normal Distribution Functions - Conditional Distribution and its relation to regression model - Estimation of parameters.

#### Module:2 Multiple Linear Regression Model

Standard multiple regression models with emphasis on detection of collinearity - outliers - non-normality and autocorrelation - Validation of model assumptions.

#### **Multivariate Regression** Module:3 4 hours Assumptions of Multivariate Regression Models - Parameter estimation - Multivariate Analysis of variance

and covariance.

Module:4	Discriminant Analysis and Principal Component Analysis	4 hours			
Statistical background - linear discriminant function analysis - Estimating linear discriminant functions and					
their properties.					

Principal components - Algorithm for conducting principal component analysis - deciding on how many principal components to retain - H-plot.

Module:5	odule:5 Factor Analysis and Clustering and Segmentation Analysis						
Factor analysis m	Factor analysis model - Extracting common factors - determining number of factors - Transformation of						
factor analysis so	lutions - Factor scores.						



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Intro	oduction - Types of clustering - Correlations and distances - clustering by partitioning n	nethods -
	rchical clustering - overlapping clustering - K-Means Clustering-Profiling and Interpreting Clustering	
	Iule:6         Data Aggregation, Group Operations and Time series	5 hours
	pBy Mechanics - Data Aggregation - Group wise Operations and Transformations - Pivot T	ables and
Cros	s Tabulations - Time Series Basics - Data Ranges - Frequencies and Shifting.	
14		0.1
	Iule:7         Contemporary Issues           stry Expert Lecture	2 hours
mau	Total Lecture hours:	30 hours
Tex	t Book(s)	
1.	Applied Multivariate Statistical Analysis, (2007), Richard A. Johnson, Dean W. Wichern	, Pearson
	Prentice Hall.	
2.	An Introduction to Multivariate Statistical Analysis, (2003), T.W. Anderson, John Wiley, N.Y.	Y.
3.	Mark Lutz, "Programming Python", O'Reilly Media, 4th edition, 2010.	
4.	Magnus Lie Hetland, "Beginning Python: From Novice to Professional", Apress, Second	l Edition,
	2005.	
	erence Books	
1.	Regression Diagnostics, Identifying Influential Data and Sources of Collinearety, (19	80), D.A
	Belsey, E. Kuh and R.E. Welsch	
2.	Applied Linear Regression Models, (1989), J. Neter, W. Wasserman and M.H. Kutner, Ho	mewood
	Illinois.	
3.	The Foundations of Factor Analysis, (1972), A.S. Mulaik, McGraw Hill, N.Y.	
4.	Introduction to Linear Regression Analysis, (2012), D.C. Montgomery and E.A. Peck, Jo N.Y.	hn Wiley
5.	Cluster analysis for Applications, (1973), M.R. Anderberg, Academic Press, N.Y.	
6.	Multivariate Statistical Analysis, (1990), D.F. Morrison, McGraw Hill, N.Y.	
7.	Python for Data Analysis,(2013), Wes Mc Kinney, O'Reilly Media, 2012.	
Mod	le of Evaluation : Digital Assignments, Continuous Assessments, Final Assessment Test	
	of Challenging Experiments (Indicative)	
1.	Introduction to Python – Keywords, identifiers, I/O statements.	2 hours
2.	Sequence and File operations, Functions, loops, Modules, errors and exceptions.	2 hours
3.	Data Manipulation- Basic Functionalities, Merging, Concatenation of data objects,	2 hours
	Exploring a Dataset and Analyzing a dataset.	
4	Data visualization – Matplotlib package, Plotting Graphs, Controlling Graph, Adding	2 hours
	Text, More Graph Types, Getting and setting values, Patches.	
5	Python Concepts, Data Structures - Interpreter, Program Execution, Statements,	2 hours
	Expressions, Flow Controls, Functions.	
6.	Numeric Types, Sequences and Class Definition, Constructors, Text & Binary Files –	2 hours
	Reading and Writing	
7	Data Wrangling: Combining and Merging Datasets, Reshaping and Pivoting, Data	2 hours





Iodel Sampling from multivariate normal distribution; MANOVA; Discriminant nalysis.	2 hours
actor marysis and cluster marysis.	2 110013
actor Analysis and Cluster Analysis.	2 hours
nalysis.	
Iultivariate Analysis: Graphical representation of multivariate data; Principal Component	2 hours
[ 1	nalysis.

Recommended by Board of Studies	16-09-2020		
Approved by Academic Council	No. 59	Date	24-09-2020



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course C		Course Title	L	Т	Р	J	C
CBS200	2	Formal Language and Automata Theory	3	0	0	0	3
Pre-requi	site	NIL	Syll	abus		ion	
				$\mathbf{V}$	. 1.0		
Course Objecti							
8	8	n formal methods and languages					
		computing models and classify their respective types					
3. Show a com	petent un	derstanding of the basic concepts of complexity theory					
	0						
formal lang 2. Derive an 3. Infer the e	ate the kn guages appropria quivalenc	me: owledge of mathematical models of computation and describ te model of computation for a given language and vice versa e of languages described using different automata or gramma putability power of automata and their limitations		w the	eyrela	ate to	C
		F					
Module:1	Intro	duction				5 h	ou
Alphabet, langu	ages and	grammars, productions and derivation, Chomsky hierarchy o	of lan	011000			
		graninars, productions and derivation, onomisky meratery of	1 1a11	guage	es.		
		grammars, productions and derivation, onomony metatory o	1 1a11	guage	28.		
expressions, no	sions and ondetermi	Ilar languages and finite automata I languages, deterministic finite automata (DFA) and equinistic finite automata (NFA) and equivalence with DFA, in utomata, properties of regular languages, Kleene's theorem	uivale regul	ence var gra	with amm	ars	ula anc
Regular express expressions, no equivalence wit regular languag	sions and ondetermi h finite a es, Myhill	lar languages and finite automata l languages, deterministic finite automata (DFA) and equ nistic finite automata (NFA) and equivalence with DFA, r utomata, properties of regular languages, Kleene's theorem -Nerode theorem and its uses, minimization of finite automa	uivale reguli	ence var gra	with amm g len	reg nars : nma	ulan anc for
Regular express expressions, no equivalence wit regular languag Module:3	sions and ondetermi th finite a es, Myhill Cont	Ilar languages and finite automata I languages, deterministic finite automata (DFA) and equinistic finite automata (NFA) and equivalence with DFA, in utomata, properties of regular languages, Kleene's theorem -Nerode theorem and its uses, minimization of finite automa ext-free languages and pushdown automata	uvale regul 1, pur 1ta.	ar gra	with amm g len	regnars anna nma 7 ho	ulan anc for
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Regular express expressions, no equivalence wit regular languag <b>Module:3</b> Context-free s nondeterminist pumping lemm <b>Module:4</b>	sions and ondetermi ch finite a es, Myhill Cont grammars ic pushdo a for cont	Ilar languages and finite automata I languages, deterministic finite automata (DFA) and equinistic finite automata (NFA) and equivalence with DFA, sutomata, properties of regular languages, Kleene's theorem -Nerode theorem and its uses, minimization of finite automa ext-free languages and pushdown automata (CFG) and languages (CFL), Chomsky and Greit own automata (PDA) and equivalence with CFG, parse tree ext-free languages, deterministic pushdown automata, closur	iivale regula , pur ita. Dach es, ar ce pro	ar gra npiną nor nbigu	with amm g len mal nity i	reg nma 7 hc for n Cl f CF 4 h	ulan for <b>our</b> ms FG Ls.
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Regular express expressions, no equivalence wit regular languag <b>Module:3</b> Context-free g nondeterminist pumping lemm <b>Module:4</b> Context-sensiti	sions and ondetermi ch finite a es, Myhill Cont grammars ic pushdo a for cont Cont ve gramm	Ilar languages and finite automata I languages, deterministic finite automata (DFA) and equinistic finite automata (NFA) and equivalence with DFA, a utomata, properties of regular languages, Kleene's theorem -Nerode theorem and its uses, minimization of finite automa ext-free languages and pushdown automata (CFG) and languages (CFL), Chomsky and Greit own automata (PDA) and equivalence with CFG, parse tree ext-free languages, deterministic pushdown automata, closur ext-free languages	iivale regula , pur ita. Dach es, ar ce pro	ar gra npiną nor nbigu	with amm g len mal nity i	reg nma 7 hc for n Cl f CF 4 h	ula anc fo our ms FG Ls.
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Regular express expressions, no equivalence wit regular languag <b>Module:3</b> Context-free g nondeterminist pumping lemm <b>Module:4</b> Context-sensiti <b>Module:5</b> The basic mod decidable (recu TMs and equi machines, TMs	sions and ondetermi ch finite a es, Myhill Cont grammars ic pushdo a for cont Cont ve gramm Ve gramm lel for Tu rsive) lang ivalence as enume	Alar languages and finite automata I languages, deterministic finite automata (DFA) and equinistic finite automata (NFA) and equivalence with DFA, in utomata, properties of regular languages, Kleene's theorem -Nerode theorem and its uses, minimization of finite automa ext-free languages and pushdown automata (CFG) and languages (CFL), Chomsky and Greith own automata (PDA) and equivalence with CFG, parse tree ext-free languages, deterministic pushdown automata, closur ext-sensitive languages mars (CSG) and languages, linear bounded automata and equivalence uring machines uring machines (TM), Turing recognizable (recursively enu guages and their closure properties, variants of Turing machines with deterministic TMs, unrestricted grammars and equivalences.	uivale regula , pur tta. Dach es, ar ce pro valen walen	nce var gra npiną nor nbigu perti ce wi lble)	with amm g len mal nity i ies of th C and leter with	reg aars nma 7 hc for n Cl f CF f CF 4 h SG. 7 h Turi mini Turi	ulan for ms FG Ls. oun ng- stic ring
Regular express expressions, no equivalence wit regular languag <b>Module:3</b> Context-free s nondeterminist pumping lemm <b>Module:4</b> Context-sensiti <b>Module:5</b> The basic mod decidable (recu TMs and equi machines, TMs <b>Module:6</b>	sions and ondetermi ch finite a es, Myhill Cont grammars ic pushdo a for cont Cont ve gramm Ve gramm lel for Tu rsive) lang ivalence as enume	Alar languages and finite automata I languages, deterministic finite automata (DFA) and equinistic finite automata (NFA) and equivalence with DFA, in utomata, properties of regular languages, Kleene's theorem -Nerode theorem and its uses, minimization of finite automata ext-free languages and pushdown automata (CFG) and languages (CFL), Chomsky and Greik own automata (PDA) and equivalence with CFG, parse tree reext-free languages, deterministic pushdown automata, closur ext-sensitive languages ars (CSG) and languages, linear bounded automata and equivalence ing machines ming machines (TM), Turing recognizable (recursively enu guages and their closure properties, variants of Turing mach with deterministic TMs, unrestricted grammars and equivalences. ecidability	uivale regula , pur uta. Dach es, ar ce pro valen umera ines, ivale	nce var gra npiną nor nbigu operti ce wi lble) nonce	with amm g len mal nity i les of th Cs and leter with	reg aars 7 ho for n Cl f CF 4 h SG. 7 h Turi Turi Turi <b>6 ho</b>	ula: anc fo: our ms FG Ls. our ng stic ring
Regular express expressions, no equivalence wit regular languag Module:3 Context-free g nondeterminist pumping lemm Module:4 Context-sensiti Module:5 The basic mod decidable (recu TMs and equi machines, TMs Module:6 Church-Turing	sions and ondetermi ch finite a es, Myhill Cont grammars ic pushdo a for cont Ve gramm I Cont ve gramm I Cont ve gramm ivalence as enume ivalence thesis, u	Alar languages and finite automata I languages, deterministic finite automata (DFA) and equinistic finite automata (NFA) and equivalence with DFA, in utomata, properties of regular languages, Kleene's theorem -Nerode theorem and its uses, minimization of finite automa ext-free languages and pushdown automata (CFG) and languages (CFL), Chomsky and Greith own automata (PDA) and equivalence with CFG, parse tree ext-free languages, deterministic pushdown automata, closur ext-sensitive languages mars (CSG) and languages, linear bounded automata and equivalence uring machines uring machines (TM), Turing recognizable (recursively enu guages and their closure properties, variants of Turing machines with deterministic TMs, unrestricted grammars and equivalences.	uivale regula , pur uta. Dach es, ar ce pro valen umera ines, ivale	nce var gra npiną nor nbigu operti ce wi lble) nonce	with amm g len mal nity i les of th Cs and leter with	reg aars 7 ho for n Cl f CF 4 h SG. 7 h Turi Turi Turi <b>6 ho</b>	ula: anc fo: our ms FG Ls. ou ng stie cing



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#### CURRICULUM (2022 - 2023)

Mod	lule:7	Basic Introduction to Co	mplexity			6 hours
Intro	oductory idea	s on Time complexity of de	1 V	ndeterminis	stic Turing mach	ines, P and
	•	eness, Cook's Theorem, othe			0	
	1		1 1			
Moo	lule:8	Contemporary Issues				2 hours
Gue	st lecture by I	Industry Experts or R&D or	ganization			
			-	Fotal Lect	ure hours:	45 hours
Tex	t Book(s)					
1.	Hopcroft, J	ohn E., Rajeev Motwani, a	and Jeffrey D. Ull	man. Intro	oduction to Aut	omata Theory,
	Languages,	and Computation, Pearson E	Education, 3 <sup>rd</sup> Editi	on, 2013.		
2.	Martin, J. C	. Introduction to Languages	and the Theory of	f Computa	tion. New York:	McGraw-Hill,
	4 <sup>th</sup> Edition,	2007.				
Refer	ence Book(s	3)				
1.	Lewis, H. F	R., and Papadimitriou, C. H.	Elements of the	Theory of	Computation. F	rentice Hall of
	India Privat	e Limited, 2015.				
2.	Dexter C. K	Kozen. Automata and compu	tability. Springer So	cience & Bu	usiness Media, 20	)12.
3.	Sipser, M. I	ntroduction to the Theory of	Computation. Cer	ngage learn	ing, 2012.	
Mode	e of Evaluati	on: CAT / Assignment / O	Quiz / FAT / Pro	ject / Sen	ninar	
Reco	mmended by	y Board of Studies	16- 09-2020			
Appro	oved by Aca	demic Council	No. 59	Date	24-09-2020	



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#### CURRICULUM (2022 - 2023)

Course Code	Course Title	L	Т	Р	J	С
CBS2003	Design Thinking	2	0	2	0	3
Pre-requisite	NIL		Syl	labu	s ver	sion
				v. 1.	0	
<b>Course Objectiv</b>	2S:					
1. Recognize the	e importance of design thinking and its various phases					
2. Apply design	thinking phases to create successful prototypes					
3. Understand t	hat both agile and design thinking process complement each other					
Expected Course						
After the successf	ul completion of the course the student should be able to					
1. Understand the	ne importance of design thinking and its different phases					
2. Empathize w	th user situations and be able to define clear problem statements					
3. Use the differ	ent ideation methods and come with different feasible and viable is	deas	for s	olvir	ng th	е
problem statem	ents.					
4. Create protot	ypes for clear understanding of the problem statement.					
5. Test the creat	ed prototypes and be able to iterate if the design does not meet the	e cus	tome	er rec	quire	ment
6. Complement	agile process with design thinking for efficient delivery process.					
Module:1 In	troduction to Design Thinking				3 h	ours
Importance of De	esign Thinking – Phases in design thinking process – Five stage m	odel	– N	on-li	neari	ty of
the five-stage mod	lel – Applications of design thinking in various domains.					
	npathize Phase					ours
	thize with the users - Steps in empathize phase - Developing emp					
	ner's mindset – Ask What? And Why? – Immersion Activity – Step	os in	imm	ersic	on ac	tivity
- Body Storming -	- Case studies.					
		r				
	efine Phase		-			ours
1	em and interpret the result – Analysis and synthesis – Perso					
1 1	ersonas – Steps to creating personas – Problem statement – Affini	-	0	ns –	Emp	bathy
mapping – Point	of View – "How might we" questions – Why-how laddering – Case	e stu	dies.			
		1				
	eate	<u> </u>				ours
	- Need for ideation – Uses of ideation – Ideation Methods – Bra			0		
0	Mind maps – Guidelines to create mind maps – Ideation games	- 51	x Ih	1nk1r	ng Ha	ats –
Doodling – Use o	f doodling in expressing creative ideas – Case studies.					
Maller D					A 1	
	ototype	Cha	act-	nict.		ours
	pes of prototyping – Guidelines for prototyping – Story telling –					_
	ng users through stories – Importance of prototyping in des	sign	tnin	кіпд	- \	alue
proposition - Gui	delines to write value proposition – Case studies.					
Madala / /T					<u>/ 1</u>	
Module:6 To	est				4 h	ours





Need	to test -User feedback - Conducting a	user test – G	uidelines f	or planning a test -	- How to test -
Desir	able, feasible and viable solutions – Itera	ite phase.		1 0	
Modu		1			3 hours
Softw	are and good design - Design thinking a	and coding $-A$	gile Metho	odology – Difference	
	esign thinking - Complementing agile wi	0	0	0.	0
		0	0		
Modu	Ile:8 Contemporary Issues				1 hour
Guest	lecture by Industry Experts or R&D or	ganization			
			Total Le	ecture hours:	30 hours
Text	Book(s)				
1.	Tim Brown, Change by Design: How I	Design Thinkin	g Transfor	ms Organizations a	nd Inspires, 1 <sup>st</sup>
	Edition, HarperCollins, 2009.				
2.	Eli Woolery, Design Thinking Handbo	ok, Invision, 24	019.		
Refer	ence Books				
1.	Nir Eyal , Hooked: How to build habit	-forming, 2014	-		
2.	Rod Judkins, The Art of Creative Thin	king, Sceptre; 1	st edition,	2015.	
Mode	of Evaluation: CAT / Assignment /	Quiz / FAT	/ Project ,	/ Seminar	
List o	of Challenging Experiments (Indicati	ve)			
1	Immersion Activity				
2	Problem Definition				
3	Different Points of View				
4	Brainstorming session				
5	Drawing Mind Maps				
6	Ideation Games				
7	Creating Prototype				
8	Planning and working on video storybo				
9	Completing the prototype as per sched	ule			
10	Testing the prototype			•	
				atory Hours:	30 hours
		Term Lab/ F.	AT / Proj	ect	
	2	0-01-2021		40.00.0001	
Appro	oved by Academic Council N	o. 61	Date	18-02-2021	





Course code		Course Title		L	Т	Р	J	С
CBS3001		Computer Networks		2	0	2	0	3
Pre-requisite		NIL			Syl	labus	versi	on
						v. 1.(	)	
Course Objective								
		ing of the fundamental concepts of comp	puter n	etw	orkir	ng, pr	otoco	ls,
architectures, a							~~ •	
	e in de	esign, implement and analyze performance p	perspecti	ve	of I	SO- O	SI lay	vered
Architecture								
3. Deal with the	major is	sues of the layers of the model.						
Expected Course	Outcon	ne:						
-		building blocks of Communication network an	d its arc	hite	ectur	е.		
-		es of switching networks and analyse the perfor						
	21	rror detection and correction mechanisms, f					sms a:	nd
various routing	g protoc	ols						
4. Design sublet	ting and	analyse the performance of network layer, C	Construct	t ar	id ex	amine	vario	us
routing protoc								
5. Understand th	e functi	onality of various layer and its associated proto	cols					
Module:1	Lutua	hatian ta Camputan Naturala		1			4 1	
		duction to Computer Networks r networks and distributed systems, Classifi						nours
	-					1		
	-	network structures. <b>Data communication</b> (	_			-		
data and its now,	vanous	connection topology, Protocols and Standards,	031 110	uei,	114	.15111155		
Module:2	Netw	ork Topology and Bandwidth					31	nours
		ess LAN, Virtual LAN. Techniques for Band	width u	tiliz	zatic	n: Mu		
		division and Wave division, Concepts on spre-					inpro	8
1 5	,		1					
Module:3	Data	Link Layer and Medium Access SubLayer					5 h	nours
Fundamentals of	Error I	Detection and Error Correction, Block coding,	Hammi	ng	Dist	ance, (	CRC;	Flow
		ol protocols - Stop and Wait, Go-back-N ARO	-		-		-	0
	_	Random Access, Multiple access protocols - I	Pure AL	.OF	IA, S	Slotted	ALC	DHA,
CSMA/CD, CDM	MA/CA							
	ът.						<b>F</b> 1	
Module:4		rork Layer		. 1				nours
		essing – IPV4, IPV6; Address mapping ding and Unicast Routing protocols.	– AKP	, I	ЛК	r, D(	JUI	anc
DITCE-Denvery,	rorwar	ing and Oncast Routing protocols.						
Module:5	Tran	sport Layer					61	nours
		munication, User Datagram Protocol (UDP),	Transmi	issic	on C	ontrol		
		Control; Quality of Service (QoS), QoS impro						
and Token Bucke	_		0		1			-
and TOKEN DUCKE	et algorii	hms.						



## Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Mo	odule:6	Application Layer				3 hours
DN	IS, DDNS, TI	ELNET, EMAIL, FTP, W	VWW, HTTP, S	NMP, Blueto	ooth, Firewalls.	
Mo	odule:7	Network Security				2 hours
Ele	ectronic mail, o	directory services and net	work manageme	nt, Basic con	ncepts of Cryptograp	phy.
	odule:8	Contemporary issues				2 hours
Gu	est lecture by	Industry Experts or R&D	organization		1	
		_	_	Total Le	ecture hours:	30 hours
Text	t Book(s)					
1.		n, Computer Networks, F				
2.		llings. Data and compute	r communication	1s. Pearson I	Education India, 20	13.
Refe	erence Book(	/				
1.		., Kaufman, C., and Spe		). Network s	security: private con	nmunication
	-	world. Pearson Education				
2.		R., Fenner, B., and Rude	off, A. M. (2018)	). UNIX Ne	twork Programming	g Volume
	1. SMIT-SN	4U.				
Mod	le of Evaluati	on: CAT / Assignment	/ Quiz / FAT	/ Project /	Seminar	
List		ng Experiments (Indica				
1.		on of all networking hards				
2.		vstem Administration: Un	8	ches and rou	uters	
3.	Network co	onfiguration commands u	sing Linux			
4.	Error detec	tion and correction mech	anisms			
5.	Flow contro	ol mechanisms				
6.	Simulation	of unicast routing protoco	ols			
7.	Observing	Packets across the netwo	rk and Performa	nce Analysis.	of Routing protoco	ols
8.	Socket prog	gramming (TCP and UDF	) – Multi client	chatting		
9.	Develop a l	DNS client server to resol	lve the given hos	st name or II	P address	
10.	Implementa	ution of Layers for securit	y protocols - SS	L/TLS		
				Т	otal Laboratory H	ours 30 hours
Mod	le of Assessm	ent: Assessments/ Mic	I Term Lab/ F	AT / Projec	t	1
Reco	ommended b	y Board of Studies	16-09-2020			
		demic Council	No. 59	Date	24-09-2020	



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#### CURRICULUM (2022 - 2023)

Course code	Course Title	L	Т	Р	J	C
CBS3002	Information Security	2	0	2	0	3
Pre- requisite	NIL	Syll	labus	sversi	on	
				v. 1.0		
Course Objectives:						
1. To study and pr	actice fundamental techniques in developing secure application	ons				
2. To understand t	he policy, procedures and guidelines to protect the computin	ng re	sourc	ces		
Expected Course Ou	itcome:					
1. To understand s	ecurity parameters and access control methods.					
2. To understand t	he fundamental policies and design principle of computing r	esou	rces			
3. To recognize sys	stem design, logic based system					
4. To study the sec	curity architecture of database, operating system and associate	ed vu	lner	abilitie	S	
Module:1			4 ho	irs		
<ul> <li>2. To understand the fundamental policies and design princip</li> <li>3. To recognize system design, logic based system</li> <li>4. To study the security architecture of database, operating system</li> <li>Module:1</li> <li>Overview of Security Parameters: Confidentiality, integrity threats; Security policy and procedure; Assumptions and Trust Operational Issues; Security Life Cycle.</li> </ul>	ty Parameters: Confidentiality integrity and availability:				tion	and
<ol> <li>To study and practice fundamental technic.</li> <li>To understand the policy, procedures and</li> <li>Expected Course Outcome:         <ol> <li>To understand security parameters and additional and the fundamental policies additional and the fundamental policies additional.</li> <li>To study the security architecture of data</li> </ol> </li> <li>Module:1         <ol> <li>Overview of Security Parameters: Confider</li> </ol> </li> </ol>			-			
		100, 1	mpn			una
operational issues, e						
Module:2			3 ho	urs		
	lels: Discretionary, mandatory, role-based and task-based m				nodel	s.
	a, temporal and spatio-temporal models.					•,
0						
Module:3			5 ho	urs		
Security Policies: Co	nfidentiality policies, integrity policies, hybrid policies, non	-inte	rfere	ncean	d poli	cv
composition, interna					1	5
1 ,						
Module:4			5 ho	urs		
	besign principles, representing identity, control of acces				tion f	flow
•	n. Assurance: Building systems with assurance, formal method					
1	, , , , , , , , , , , , , , , , , , ,	,		0	<u> </u>	
Module:5			6 ho	urs		
	Malicious logic, vulnerability analysis, auditing, intrusion					
0 ,	rk security, operating system security, user security, program				Tonic	·s·
11	action to digital forensics, enterprise security specification.	occui		peelui	ropie	
Duta privacy, introdu						
Module:6			3 ho	urs		
	ecurity: Security Architecture, Analysis of Security in Linux/					
Sperading bystering b	councy. Security memocrate, maryors of security in Emitax/	** 111	40 W 3	•		
Module:7			2 ho	urs		
	ecurity Architecture, Enterprise security, Database auditing.	L				
	, auditing, Enterprise secondy, Enterprise auditing.					





Mo	odule:8	Contemporary issues			2 hours
Gues	st lecture by In	dustry Experts or R&D organizat	ion		
			Total L	ecture hou	rs: 30 hours
Te	xt Book(s)				
	Anderson, R.	Security engineering. John Wile	v & Sons, 2008.		
	Bishop, M. C	omputer Security: Art and Science	e. Pearson Educ	cation, Bos	ton, US, 2003.
	Stamp, M. In	formation security: principles and	d practice. John '	Wiley & So	ons, 2014.
Ref	ference Book	(s)			
	Pfleeger, C. F	, Pfleeger, S. L., and Margulies,	J. Security in Co	mputing,P	roQuest Safari Tech Books
	Online, 2017.				
2.	Wheeler, D. A	A. Secure programming HOWTC	<b>)</b> , 2017.		
	Zalewski, M.	Google browser security handbo	ok, 2009.		
	Gertz, M., &	Jajodia, S. (Eds.). Handbook of o	latabase security:	application	ns andtrends. Springer
	Science & Bu	siness Media, 2007.			
Mo	ode of Evaluat	ion: CAT / Assignment / Qui	z / FAT / Proj	ect / Semi	inar
Lis	_	ing Experiments (Indicative)			
•	-	security in Unix/Linux.			
•	Administrat	on of users, password policies, p	rivileges and role	es	
		essment of information security sy	stems using auto	mated tool	S
•	Vulnerability	Identification and Prioritization			
	Web Applic	ation Security Configuration			
			Total Labor	atory Hou	ars 30 hours
Mo	ode of Assessr	nent: Assessments / Mid Terr	n Lab / FAT / 1	Project	
Ree	commended	by Board of Studies	09-09-2020		
Ap	proved by Ac	ademicCouncil	No.59	Date	24-09-2020



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course Code	Course Title	L	T	Р	J	С
CBS3003	Design and Analysis of Algorithms	3	0	2	0	4
Pre-requisite	NIL		•	ıbus	ver	sior
			V	. 1.0		
Course Objectives:						
•	ymptotic performance of algorithms.					
	nt algorithmic design paradigms and methods of analysis.					
3. Synthesize eff	cient algorithms in common engineering design situations.					
Expected Course C	Outcome:					
1. Analyse worst	-case running times of algorithms using asymptotic analysis.					
2. Identify suitab	le algorithmic paradigm for solving the given problem					
3. Understand ar	d apply various graph-based algorithms					
4. Understand th	e classes of complexity					
5. Introduction t	o approximation, randomized and quantum algorithms					
6. Describe vario	us algorithmic strategies, analysis and their implementation					
Characteristics of A	lgorithm. Analysis of Algorithm: Asymptotic analysis of Com	plexi	ty Bo	unds	- 1	sest
6. Describe various algorithmic strategies, analysis and their implementation         Module:1       Introduction to algorithmic analysis         8 hourse         Characteristics of Algorithm. Analysis of Algorithm: Asymptotic analysis of Complexity Bounds – Best         Average and Worst-Case behavior; Performance Measurements of Algorithm, Time and Space Trade-Offse						
Average and Worst-	Case behavior; Performance Measurements of Algorithm, Time	e and	Space	e Tra	de-(	Offs
-			-			
Analysis of Recursi	ve Algorithms through Recurrence Relations: Substitution M		-			
Analysis of Recursi	ve Algorithms through Recurrence Relations: Substitution M		-			
Analysis of Recursi Method and Masters	ve Algorithms through Recurrence Relations: Substitution M 'Theorem.		-	cursi	on '	[re
Analysis of Recursi Method and Masters Module:2 Fund	ve Algorithms through Recurrence Relations: Substitution M 'Theorem. lamental Algorithmic Strategies	[etho	d, Re	cursi	on ' 7 ho	Fre our
Analysis of Recursi Method and Masters Module:2 Fund Brute-Force, Heuris	Dected Course Outcome:         1. Analyse worst-case running times of algorithms using asymptotic analysis.         2. Identify suitable algorithmic paradigm for solving the given problem         3. Understand and apply various graph-based algorithms         4. Understand the classes of complexity         5. Introduction to approximation, randomized and quantum algorithms         6. Describe various algorithmic strategies, analysis and their implementation         dule:1       Introduction to algorithmic analysis         racteristics of Algorithm. Analysis of Algorithm: Asymptotic analysis of Cerage and Worst-Case behavior; Performance Measurements of Algorithm, Tralysis of Recursive Algorithms through Recurrence Relations: Substitution hod and Masters' Theorem.         dule:2       Fundamental Algorithmic Strategies         te-Force, Heuristics, Branch and Bound and Backtracking methodologioniques for Problem-Solving, Bin Packing, Knapsack, Travelling Salesman Pro-	letho Illu	d, Re	cursi	on ' 7 ho	Fre our
Analysis of Recursi Method and Masters Module:2 Fund Brute-Force, Heuris	ve Algorithms through Recurrence Relations: Substitution M 'Theorem. Iamental Algorithmic Strategies Itics, Branch and Bound and Backtracking methodologies;	letho Illu	d, Re	cursi	on ' 7 ho	Fre our
Analysis of Recursi Method and Masters Module:2 Fund Brute-Force, Heuris techniques for Probl Module:3 Gree	ve Algorithms through Recurrence Relations: Substitution M 'Theorem. <b>Iamental Algorithmic Strategies</b> stics, Branch and Bound and Backtracking methodologies; em-Solving, Bin Packing, Knapsack, Travelling Salesman Proble dy and Dynamic Programming	Ietho Illu em.	d, Re	ons c	on <sup>7</sup> 7 ho of th 8 ho	ours ours
Analysis of Recursi Method and Masters Module:2 Fund Brute-Force, Heuris techniques for Probl Module:3 Gree Dynamic Programm	ve Algorithms through Recurrence Relations: Substitution M 'Theorem. <b>Jamental Algorithmic Strategies</b> trics, Branch and Bound and Backtracking methodologies; em-Solving, Bin Packing, Knapsack, Travelling Salesman Proble <b>dy and Dynamic Programming</b> ingElements of Dy Programming, Rod Cutting, Matrix chain	Ietho Illu em. mult	d, Re stratic	ion,	on <sup>7</sup> 7 ho of the <b>8 ho</b> Lon	Dura neso pura ges
Analysis of Recursi Method and Masters Module:2 Fund Brute-Force, Heuris techniques for Probl Module:3 Gree Dynamic Programm	ve Algorithms through Recurrence Relations: Substitution M 'Theorem. <b>Iamental Algorithmic Strategies</b> stics, Branch and Bound and Backtracking methodologies; em-Solving, Bin Packing, Knapsack, Travelling Salesman Proble dy and Dynamic Programming	Ietho Illu em. mult	d, Re stratic	ion,	on <sup>7</sup> 7 ho of the <b>8 ho</b> Lon	Free our nese ges
Analysis of Recursi Method and Masters Module:2 Fund Brute-Force, Heuris techniques for Probl Module:3 Gree Dynamic Programm Common Subseque:	ve Algorithms through Recurrence Relations: Substitution M 'Theorem. <b>Jamental Algorithmic Strategies</b> trics, Branch and Bound and Backtracking methodologies; em-Solving, Bin Packing, Knapsack, Travelling Salesman Proble <b>dy and Dynamic Programming</b> ingElements of Dy Programming, Rod Cutting, Matrix chain	Ietho Illu em. mult	d, Re stratic	ion,	on <sup>7</sup> 7 ho of the <b>8 ho</b> Lon	Fre our nes
Analysis of Recursi Method and Masters Module:2 Fund Brute-Force, Heuris techniques for Probl Module:3 Gree Dynamic Programm Common Subseque: Knapsack proble, Hu	<ul> <li>Algorithms through Recurrence Relations: Substitution M.</li> <li>Theorem.</li> <li>Iamental Algorithmic Strategies</li> <li>Atics, Branch and Bound and Backtracking methodologies;</li> <li>em-Solving, Bin Packing, Knapsack, Travelling Salesman Problem</li> <li>dy and Dynamic Programming</li> <li>ingElements of Dy Programming, Rod Cutting, Matrix chain</li> <li>hce; Greedy Algorithms- Activity Selection Problem, Eleme</li> <li>affman Coding; Fibonacci Heaps</li> </ul>	Ietho Illu em. mult	d, Re stratic	ion,	7 ho 7 ho of t 8 ho Lon strat	Fre our nes our ges egy
Analysis of Recursi Method and Masters Module:2 Fund Brute-Force, Heuris techniques for Probl Module:3 Gree Dynamic Programm Common Subseque: Knapsack proble, Hu Module:4 Grap	ve Algorithms through Recurrence Relations: Substitution M 'Theorem. damental Algorithmic Strategies stics, Branch and Bound and Backtracking methodologies; em-Solving, Bin Packing, Knapsack, Travelling Salesman Proble dy and Dynamic Programming ingElements of Dy Programming, Rod Cutting, Matrix chain nce; Greedy Algorithms- Activity Selection Problem, Eleme affman Coding; Fibonacci Heaps h and Tree Algorithms	Ietho Illu em. mult	d, Re stratic	ion, edy	on <sup>7</sup> 7 ho of ti 8 ho Lon strat 5 ho	Dura ges egy
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Module:7	Quantum Algorithms	2 hours
Introducti	on to Quantum Algorithms	
Module:8	Contemporary issues	2 hours
Guest lect	ure by Industry Experts or R&D organization	
	Total Lecture hours:	45 hours
Text Boo	k(s)	
1. Ho	prowitz, E., Sahni, S., & Rajasekaran, S. Fundamental of computer algorithm	thms, Hyderabad,
Un	iversities Press; Second edition, 2008.	
2. Kl	einberg J, Tardos E. Algorithm design. Pearson Education India; 2006	
Reference		
	uth Donald E, "Art of Computer Programming: Fundamental Algorith	ims Volume 1 -
	ndamental Algorithms", Third Edition, Pearson Publishers, 2011.	
	t Morin, "Open Data Structures: An Introduction (Open Paths to Enriched Lea	arning)" 31st ed
	ition, UBC Press, 2013.1974.	unnig, , sist cu.
Mode of I	Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar	
List of Ch	allenging Experiments (Indicative)	
	plementation of various data structures (recap)	
	mputing the time complexity of the given algorithms	
	ute force strategy	
	eedy strategy -Activity selection, knapscak	
	namic programming- MCM, LCS and 0/1 knapsack	
	anch and Bound strategy	
7 Ba	cktracking -8 Queens problem	
	aph search algorithms	
	nimum Spanning Tree	
	ortest path algorithm	
	etwork flow –Min cut	
12 Ap	proximation algorithms- TSP and vertex cover	
	Total Laboratory Hours:	30 hours
	Assessment: Assessments/ Mid Term Lab/ FAT / Project	
	ended by Board of Studies 29-01-2021	
Approved	by Academic Council No. 61 Date 18-02-2021	



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#### CURRICULUM (2022 - 2023)

CBS3004	Course Title	L	T	P	J	C
	Artificial Intelligence	2	0	2	0	3
Pre-requisite	NIL			labus		sior
				v. 1.(	)	
Course Objectiv						
-	tificial intelligence principles, techniques and its history.					
	applicability, strengths, and weaknesses of the basic knowledge rep	reser	itatioi	n, pro	blen	1
-	solving, and learning methods in solving engineering problems. To develop intelligent systems by assembling solutions to concrete computational pected Course Outcome: Evaluate Artificial Intelligence (AI) methods and describe their foundations. Apply basic principles of AI in solutions that require problem solving, inference, pepresentation and learning.					
3. To develop in	ntelligent systems by assembling solutions to concrete computationa	l pro	oblem	S		
<u> </u>						
			. <b>.</b>	1	1 1	
		erce	ption,	,know	vledg	e
		1	1		1	
	e knowledge of reasoning and knowledge representation for solving			-	lems	•
	illustrate how search algorithms and planning play vital role in probl	em s	solvin	g.		
	ent scope and limitations of AI and societal implications.					
6. Illustrate and	implement the construction of basic AI models and expert systems	•				
					4.7	-
Module:1	Introduction, Overview of Artificial intelligence	0			4 H	
	I, AI technique, Tic - Tac - Toe problem. Intelligent Agents, Agents			nmen	t, na	ur
ot environmen	t, structure of agents, goal-based agents, utility-based agents, learning	g age	ents.			
Module:2					2 1	<b>.</b>
					3 H	LOI
	Problem Solving, Problems, Problem Space & search	otico		e in t	ho de	
Defining the pr	oblem as state space search, production system, problem characteria	stics,	, issue	s in t	he de	esig
	oblem as state space search, production system, problem characteria	stics,	, issue	s in t	he de	esig
Defining the progr	roblem as state space search, production system, problem characteria	stics,	, issue	s in t		
Defining the progr of search progr Module:3	Search techniques				5 H	[01
Defining the proof of search progr Module:3 Problem solvir	Search techniques         Ig agents, searching for solutions; uniform search strategies: breadt	h fir	st sea	rch, o	<b>5 H</b> depth	<b>Iou</b> 1 fi
Defining the progr of search progr <b>Module:3</b> Problem solvin search, depth	Search techniques         g agents, search, production system, problem characteria         ams.	h fir rateg	st sea	rch, o Ieuris	<b>5 H</b> depth stic s	Iou n fi ear
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree	Search techniques         Ig agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies breadt         dy best-first search, A* search, AO* search, memory bounded heuropean	h fir rateg	st sea jes. F	rch, o Ieuris ch: lo	<b>5 F</b> depth stic s ocal s	Iou n fi ear
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree	Search techniques         g agents, search, production system, problem characteria         ams.	h fir rateg	st sea jes. F	rch, o Ieuris ch: lo	<b>5 F</b> depth stic s ocal s	<b>Iou</b> n fi ear ear
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree	Search techniques         Ig agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies         dy best-first search, A* search, AO* search, memory bounded heu         ptimization problems: Hill climbing search, simulated annealing search	h fir rateg	st sea jes. F	rch, o Ieuris ch: lo	<b>5 F</b> depth stic s ocal s	Iou 1 fi ear ear
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree algorithms & o Module:4	Search techniques         Ig agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies breadt         dy best-first search, A* search, AO* search, memory bounded heuropean	h fir rateg rristio	st sea jes. F c sear local t	rch, o Ieuris ch: lo Deam	5 H depth stic s ocal s searc 4 H	Iou n fi ear ear ch.
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree algorithms & o Module:4 Local search fo	soblem as state space search, production system, problem characteria         ams.         Search techniques         ag agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies: dy best-first search, A* search, AO* search, memory bounded heu         ptimization problems: Hill climbing search, simulated annealing search         r constraint satisfaction problems. Adversarial search, Games, optimina	h fir rateg rristic cch, l	st sea ies. H c sear local t ecisio	rch, o Ieuris ch: lo beam ns &	5 H depth stic s ocal s searc 4 H strat	Iou n fi ear ch. Iou egi
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree algorithms & o Module:4 Local search for	Search techniques         Ig agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies: dy best-first search, A* search, AO* search, memory bounded heu         ptimization problems: Hill climbing search, simulated annealing search	h fir rateg rristic cch, l	st sea ies. H c sear local t ecisio	rch, o Ieuris ch: lo beam ns &	5 H depth stic s ocal s searc 4 H strat	Iou n fr ear ear ch.
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree algorithms & o Module:4 Local search fo in games, the n Module:5	Soblem as state space search, production system, problem characteria         ams.         Search techniques         ag agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies: dy best-first search, A* search, AO* search, memory bounded heu         ptimization problems: Hill climbing search, simulated annealing search         r constraint satisfaction problems         r constraint satisfaction problems. Adversarial search, Games, optim         minimax search procedure, alpha-beta pruning, additional refinement         Knowledge & reasoning	h fir rateg rristic cch, l nal d s, ite	ecisio	rch, o Ieuris ch: lo beam ns & e deep	5 H depth stic s searc 4 H strat penin 5 1	Iou n fr eau ch. Egi g.
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree algorithms & o Module:4 Local search fo in games, the n Module:5	Soblem as state space search, production system, problem characteria         ams.         Search techniques         ag agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies: breadt         dy best-first search, A* search, AO* search, memory bounded heu         ptimization problems: Hill climbing search, simulated annealing search         r constraint satisfaction problems. Adversarial search, Games, optin         ninimax search procedure, alpha-beta pruning, additional refinement	h fir rateg rristic cch, l nal d s, ite	ecisio	rch, o Ieuris ch: lo beam ns & e deep	5 H depth stic s searc 4 H strat penin 5 1	Iou n fr eau ch. Egi g.
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree algorithms & o Module:4 Local search fo in games, the n Module:5 Knowledge rep	Soblem as state space search, production system, problem characteria         ams.         Search techniques         ag agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies: dy best-first search, A* search, AO* search, memory bounded heu         ptimization problems: Hill climbing search, simulated annealing search         r constraint satisfaction problems         r constraint satisfaction problems. Adversarial search, Games, optim         minimax search procedure, alpha-beta pruning, additional refinement         Knowledge & reasoning	h fir rateg rristio rch, l nal d s, ite	st sea ies. H c sear ocal h ecisio erative	rch, o Ieuris ch: lo beam ns & e deep	5 H depth stic s ocal s searc 4 H strat penin 5 I senta	Ion n fr ean ch. Egi g. Ion tio
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree algorithms & o Module:4 Local search for in games, the n Module:5 Knowledge rej Using predica	Search techniques         ag agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies: breadt         dy best-first search, A* search, AO* search, memory bounded heu         ptimization problems: Hill climbing search, simulated annealing search         r constraint satisfaction problems         ninimax search procedure, alpha-beta pruning, additional refinement         Knowledge & reasoning         presentation issues, representation & mapping, approaches to knowledge	h fir rateg rristic cch, l nal d s, itc	edge	rch, o Ieuris ch: lo peam ns & e deep repres	5 H depth stic s ocal s searce 4 H strat penin 51 senta ation	Ion f ean ch. lon egi g. for tio
Defining the proof of search progr Module:3 Problem solvin search, depth strategies Gree algorithms & o Module:4 Local search for in games, the n Module:5 Knowledge rep Using predica computable fu	soblem as state space search, production system, problem characteria         ams.         Search techniques         ag agents, searching for solutions; uniform search strategies: breadt         limited search, bidirectional search, comparing uniform search strategies: dy best-first search, A* search, AO* search, memory bounded heuptimization problems: Hill climbing search, simulated annealing search         Constraint satisfaction problems         r constraint satisfaction problems. Adversarial search, Games, optin         minimax search procedure, alpha-beta pruning, additional refinement         Knowledge & reasoning         presentation issues, representation & mapping, approaches to knowledge, representing simple fact in logic, representing instart	h fir rateg rristic cch, l nal d s, ite	st sea ies. F c sear local b ecisio erative edge = z ISA wledg	rch, o Ieuris ch: lo beam ns & e deep repres repres	5 H depth stic s scal s searc 4 H strat benin 5 I senta ation ing r	Ion ean ean ch. Ion egri g. Ion tio



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#### CURRICULUM (2022 - 2023)

Module:6	Probabilistic Reasonin	ıg			4 Hours
Representi	ng knowledge in an uncertain	domain, the	semantics of	of Bayesian networks, Demp	ster- Shafer
theory, Pla	nning Overview, components	s of a plann	ing system,	Goal stack planning, Hierar	chical planning,
-	ning techniques.	-			1 0
<b>1</b>					
Module:7	Expert Systems				3 Hours
Representi	ng and using domain knowled	ge, expert sy	stem shells.	, and knowledge acquisition.	
1					
Module:8	Contemporary issues				2 Hours
Guest lectu	re by Industry Experts or R&	D organizat	ion		
				<b>Total Lecture Hours</b>	30 Hours
Text Book(					
	ell, S. and Norvig, P. Artificial	Intelligence	e - A Moder	n Approach, 3rd edition, Pre	entice Hall.,
2015					
	e, D. and Mackworth, A. Artif	ficial Intellig	ence: Found	lations of Computational Ag	gents,
	bridge University Press, 2010				
Reference		A .: C : 1 T	. 11		11 2000
	E., Knight, K and Shankar, B.				
	r, G.F Artificial Intelligence - on, Pearson, 2008.	-Structures a	ind Strategie	es for Complex Problem Sor	ving, oth
	valuation: CAT / Assignmen	at / Oniz /	FAT / Pro	viect / Seminar	
	aluation. CAT / Assignmen		1/11/110	Jeet / Seminar	
Lab Experi	ments				
	ng Missionaries and cannibals	problems			
	er Jug Problem	1			
	leens Problem				
4. Trav	elling Salesman Problem				
5. Solvi	ng Wampus Problem using Lo	ogic			
6. Mon	keys and Bananas Problem us	ing Logic			
7. Baye	sian Classification Problem				
8. Deci	sion Tree Problem				
	eloping a sentiment analysis sy				
10. Deve	elopment of Medical Expert sy	stem with I	Recommend	ation system	
			Т	'otal Laboratory Hours:	30 Hours
	Assessment: Assessments/	Mid Term	Lab/ FAT	/ Project	
	nded by Board of Studies	29-01-202			
Approved	by Academic Council	No. 61	Date	18-02-2021	



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#### CURRICULUM (2022 - 2023)

<b>Course Code</b>	Course Title	L	Τ	Р	J	С
CBS3011	Usability Design of Software Applications	2	0	2	0	3
Pre-requisite	NIL		Sylla	bus	vers	ion
				v.1.	0	
Course Objectives			<u> </u>			
	ing system through which management students can enhand	ce th	e1r 11	nnov	atioi	n an
creative thinking ski						
1	selves with the special challenges of starting new ventures	-			_	
3. To use IPR as an	effective tool to protect their innovations and intangible assets	from	expl	oitat	ion	
$\overline{\mathbf{E}}$ (10)						
Expected Course (	students to the fundamentals of User Centred Design and	Hao				that
relevance and contri	0	Use	T EX	pene	ence	the
					.1	1:-:-
artefacts	to the facets of User Experience (UX) Design, particularly a	as ap	pneu	10	the c	ligiti
	nor research solution concentralization and validation as into			otiri		n th
design and developm	user research, solution conceptualization and validation as inte	.1.001		CUVI		11 UI
0 1	•		d we		rith i	n th
future	y to constructively engage with the Design professionals they	woui	a we	DIK W	/1011	in un
	ify the methods to offer a better UI experience for the applicati	0.00				
6. Gain expertise in	redesigning an existing Application or website for better user ex	perie	ence			
Module:1 Int	oduction to User Centred Design				2 1	nour
Basics of User Center					51	Iour
Dusies of eser Gena						
Module:2 Ast	ects of User Centred Design				41	nour
	n Assignment – Evaluating the product from user centered	desi	gn as	spect	s su	ch a
	Tuse, ergonomics, and aesthetics.		0	1		
Module:3 He	uristic Evaluation				61	nour
10 Heuristic Princip	les, Examples Heuristic Evaluation: Group Assignment initiat	tion	(Web	osite	and	App
1	1 6 1 1 2 6 1 2 2 2 1 2 2		1 .	ions		
	isks of the app or website for heuristic principles, severity, reco	mme	endat	10113.		
Evaluation for key t		mme	endat	10113.		
Evaluation for key ta Module:4 Pro	ject design lifecycle					
Evaluation for key ta Module:4 Pro Redesign project th	ject design lifecycle rough the design lifecycle – Discovery - Define – Design					
Evaluation for key ta	ject design lifecycle rough the design lifecycle – Discovery - Define – Design					
Evaluation for key ta Module:4 Pro Redesign project th Prototype) - Usabilit	<b>ject design lifecycle</b> rough the design lifecycle – Discovery - Define – Design y Testing				t (E	)esig
Evaluation for key toModule:4ProgramRedesign project thPrototype) - UsabilityModule:5UX	ject design lifecycle arough the design lifecycle – Discovery - Define – Design y Testing Research	1 - I	mple	men	t (C	nour
Evaluation for key taModule:4ProRedesign project thPrototype) - UsabilitaModule:5UXUnderstanding user	ject design lifecycle rough the design lifecycle – Discovery - Define – Design y Testing Research s, their goals, context of use, and environment of use. Research	1 - I	mple	men	t (C	Design
Evaluation for key taModule:4ProRedesign project thPrototype) - UsabilitaModule:5UXUnderstanding user	ject design lifecycle arough the design lifecycle – Discovery - Define – Design y Testing Research	1 - I	mple	men	t (C	Designour
Evaluation for key taModule:4ProRedesign project thPrototype) - UsabilitaModule:5UXUnderstanding userEnquiry, User Interval	ject design lifecycle rough the design lifecycle – Discovery - Define – Design y Testing Research s, their goals, context of use, and environment of use. Research riews, Competitive Analysis for UX	1 - I	mple	men	t (D 51 Conte	)esig nour extua
Evaluation for key taModule:4ProRedesign project thPrototype) - UsabilityModule:5UXUnderstanding userEnquiry, User IntervModule:6Per	ject design lifecycle rough the design lifecycle – Discovery - Define – Design y Testing Research s, their goals, context of use, and environment of use. Research riews, Competitive Analysis for UX sonas and Scenarios	ı - I Tech	mple	emen les: (	t (D 51 Conte 31	Designour nour extua
Evaluation for key taModule:4ProRedesign project thPrototype) - UsabilitaModule:5UXUnderstanding userEnquiry, User IntervalModule:6Per	ject design lifecycle rough the design lifecycle – Discovery - Define – Design y Testing Research s, their goals, context of use, and environment of use. Research riews, Competitive Analysis for UX	ı - I Tech	mple	emen les: (	t (D 51 Conte 31	esig noui extu



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Mod	lule:7	Development and Proto	otyping		3 hour
Cond	cept Devel	opment - Task flow detail	ing for the Proje	ct - Prototyping	Techniques - Paper, Electronic
and l	Prototypin	g Tools.			
Mod	lule:8	Contemporary issues			2 hour
Gues	st lecture b	y Industry Experts or R&E	organization		· · · · · · · · · · · · · · · · · · ·
				Total Lect	ure hours: 30 hour
	t Book(s)				
1.		Preece, Helen Sharp, Yv on", 2015, 4 <sup>th</sup> Edition, Wile		Interaction Des	ign: Beyond Human-Compute
Refe	rence Bo		y publications.		
1.			"About Face T	he Essentials o	f Interaction Design", 2014, 4
		Wiley Publications.	,		
2.	,	2	vsky, Andrea M	oed, "Obser	ving the User Experience - A
					an Kaufmann Publications.
Mod		uation: CAT / Assignmen			
List	of Challer	nging Experiments (Indi	cative)		
1.		a website or an App to rede		ation	
2.		of the mobile app or the we			e
3.		ng Personas and Scenarios f	0	0 1	
4.		development and task flow			
5.		e development with Iteratio		on	
6.	Usability	testing and demonstration			
				Total	Laboratory Hours: 30 hour
Mod	le of Asse	ssment: Assessments/Mi	dterm lab/Proj	ect/FAT	
D	ommende	d by Board of Studies	22-05-2021		
Kec		u by board of Studies	00 _0_1		



## Villore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course Code	Course Title	L	Т	P	J	С
CBS3012	IT Project Management	2	0	2	0	3
Pre-requisite	NIL				s vers	ion
0				v.1.	.0	
Course Objectives:						
, 1	nanage, execute, and control projects within the stipulated tim		с .			
, (	ge cost targets with a focus on Information Technology and Se			or		
3. To understand vario	us agile project management techniques such as Scrum and D	evOf	DS.			
E						
Expected Course Ou	ject Management activities and to identify basic project ma	<b>1</b> 0000	ment	olzi	110 374	th a
	, e	0		SKL	115 WI	111 2
	issues and problems associated with delivering successful IT			الم ما	line	
	v network to use PERT and to manage project risks such as Ro	esou	ce sc	nea	uning	and
cost control.						
	concept of Agile Project Management and IT Service Manager	ment	•			
	various terminologies and best practices followed in scrum.			-		
	ept of Devops and its Working, Automated testing and tes	st-dri	ven r	net	hods	anc
continuous deployn						
6. To demonstrate the	e working of IT Project Management with various tools and te	chno	logie	s.		
	ct Overview and Feasibility Studies			1	3 ho	ours
Project Identification,	Market and Demand Analysis, Project Cost Estimate, Financia	ıl Ap	praisa	ıl.		
Module:2 Project	et Cale a de l'an e				5 ho	
	ct Scheduling troduction to PERT and CPM, Critical Path Calculation, Pr	ocod	2000	Pol		
, 0.	ERT and CPM, Float Calculation and its importance, Cost red					<b>T</b> .
	and CI M, Float Calculation and its importance, Cost re	Jucu	on by	CI	asiiii	g OI
activity.						
Module:3 Cost	Control and Scheduling				3 ho	111#6
	PERT/Cost), Resource Scheduling & Resource Levelling				5 110	uis
	Entry 6050, Resource beneduning et resource bevenning					
Module:4 Project	ct Management Features				3 ho	ours
	Control, Project Audit and Project Termination					
	, , ,					
Module:5 Agile	Project Management				5 ho	ours
0	nciples, Agile methodologies, Relationship between Agile Scru	ım, I	.ean,	Dev	vOps	and
IT Service Managemen	t (ITIL).				-	
0						
Module:6 Scrun	n				4 ho	ours
Various terminologies	used in Scrum (Sprint, product backlog, sprint backlog	; sp	rint 1	evie	ew, r	etro
perspective), various ro	oles (Roles in Scrum), Best practices of Scrum.					
· ·	-					
Module:7 DevO					5 ho	
Overview and its Com	ponents, Containerization Using Docker, Managing Source Co	ode a	nd A	utor	mating	g





Bui	lds, Automated Testing and Test-D	riven Developme	nt, Contin	nuous Integration,	Configuration
	nagement, Continuous Deployment, Au	-		-	-
	KP, FDD, DSDM, Crystal.		Ċ,	0	
Mo	dule:8 Contemporary issues				2 hours
Gu	est lecture by Industry Experts or R&D	organization			
			Total L	ecture hours	30 hours
Те	kt Book				
1.	Mike Cohn, Succeeding with Agile: So	oftware Developm	ent Using	Scrum, 2015, 1 <sup>st</sup> Ed	ition Addison-
-	Wesley Professional.		8	,,,	
Ref	erence Books				
1.	Roman Pichler, Agile Product Manag	gement with Scrur	n: Creating	g Products that Cu	stomers Love,
	2011, First edition, Addison-Wesley.			-	
2.	Ken Schwaber, Agile Project Managem	ent with Scrum, 20	)14,1 <sup>st</sup> editi	on, Microsoft Press	US.
Mo	de of Evaluation: CAT / Assignment	: / Quiz / FAT /	Project /	Seminar	
	×				
Lis	t of Challenging Experiments (Indica				
1	Estimate the IT Project Cost and Cont	0 1	rce tools		
2	Scheduling a Project with PERT and C	PM:			
	1. Estimation of the total time rec		1 /		
	2. The individual activities to mee	1 / 1			
	Identify the critical bottleneck activities	where any delays	must be av	oided to prevent del	laying project
	completion.				
4	IT project risk analysis using open-sour	ce tools			
5	Design IT Project Audit Template				
6	Agile Project Management Tools (Oper	n source)			
7	Design IT Service Management (ITIL)	Templates			
8	Scrum: IT Project Management, DevO	ps and Automated	Testing To	ools	
			Tot	al Laboratory Hou	ars 30 hours
Mo	de of Assessment: Assessments/ Mi	d Term Lab/ FA	T / Projec	et	· · · · · · · · · · · · · · · · · · ·
	commended by Board of Studies	22-05- 2021			
App	proved by Academic Council	No. 62	Date	15-07-2021	



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Course Code	Course Title I		Р	J	C
EEE1001	Basic Electrical and Electronics Engineering   2	-	2	0	3
Pre-requisite	NIL S	yllabu		sion	
		V	. 1.0		
Course Objectives:		1			
	various laws and theorems applied to solve electric circuits and ne				
-	dents with an overview of the most important concepts in Electr	cal and	Elec	ctron	105
Engineering which is	the basic need for every engineer				
Expected Course O	utcome:				
	al circuit problems using various laws and theorems				
	-				
, ,					
0 1	0			1 1 /	
		arious	moc	iulati	on
1	0 0				
6. Design and conduc	t experiments to analyze and interpret data				
	• •			F 1	
<ul> <li>2. Analyze AC power circuits and networks, its measurement and safety concerns</li> <li>3. Classify and compare various types of electrical machines</li> <li>4. Design and implement various digital circuits</li> <li>5. Analyze the characteristics of semiconductor devices and comprehend the various modulation techniques in communication engineering</li> <li>6. Design and conduct experiments to analyze and interpret data</li> <li>Module:1 DC circuits 5 hours</li> <li>Basic circuit elements and sources, Ohms law, Kirchhoff's laws, series and parallel connection of circuit elements, Node voltage analysis, Mesh current analysis, Thevenin's and Maximum powertransfer theorem.</li> <li>Module:2 AC circuits 6 hours</li> </ul>					
elements, Node volta	ge analysis, Mesh current analysis, Thevenin's and Maximum powe	rtransf	er the	eoren	
		rtransf			ı.
Module:2 AC o	ircuits			6 ho	n. urs
Module:2     AC of the second se	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ	cuits, I	Power	<b>6 ho</b>	n. ur
Module:2 AC of Alternating voltages circuits-Power Factor	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T	cuits, I	Power	<b>6 ho</b>	n. ur
Module:2 AC of Alternating voltages circuits-Power Factor	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ	cuits, I	Power	<b>6 ho</b>	n. ura
Module:2 AC of Alternating voltages circuits-Power Factor Measurement – Elect	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T rical Safety –Fuses and Earthing, Residential wiring.	cuits, I	'ower 'hase	6 ho cin 7 Pow	n. ura AC
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3Elect	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T rical Safety –Fuses and Earthing, Residential wiring. trical Machines	cuits, I hree F	Power	6 ho rin 2 Pov 7 ho	n. urs AC ver
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, Worki	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines	cuits, I hree I , Singl	Power hase	6 ho rin 2 Pow 7 ho ase a	n. ur AC ver
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, Worki	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T rical Safety –Fuses and Earthing, Residential wiring. trical Machines	cuits, I hree I , Singl	Power hase	6 ho rin 2 Pow 7 ho ase a	n. urs AC ver
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInduction	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and	cuits, I hree I , Singl	Power hase hase pha mote	6 ho rin 7 Pov 7 ho ase a or.	n. ura AC ver
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4Digi	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T rical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems	cuits, I hree F , Singl BLDC	Power Phase Phase pha mote	6 ho rin 7 Pov 7 ho ase a or. 5 ho	n. urs Ver urs urs
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4DigitBasiclogiccircuit	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C	cuits, I hree F , Singl BLDC	Power Phase Phase pha mote	6 ho rin 7 Pov 7 ho ase a or. 5 ho	n. urs Ver urs urs
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4Digi	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C	cuits, I hree F , Singl BLDC	Power Phase Phase pha mote	6 ho rin 7 Pov 7 ho ase a or. 5 ho	n. ura AC ver ura nd
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4DigitBasiclogiccircuits, Synthesis of I	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C ogic circuits	cuits, I hree F , Singl BLDC	Power hase hase pha moto	6 ho rin 7 Pow 7 ho ase a or. 5 ho al lo	n. ur vei ur gic
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4DigitBasiclogiccircuits, SynthesisModule:5Sem	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C ogic circuits iconductor devices and Circuits	cuits, I hree F , Singl BLDC Combin	Power hase hase pha mote	6 ho rin 7 Pov 7 ho ase a or. 5 ho al lo 7 ho	n. ura Ven ura nd gic
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4DigitBasiclogiccircuits, Synthesis of IModule:5SemConduction in Semic	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C ogic circuits iconductor devices and Circuits onductor materials, PN junction diodes, Zener diodes, BJTs, MC	cuits, I hree F , Singl BLDC Combin	Power hase hase pha mote ation s, Re	6 ho rin 2 Pow 7 ho ase a or. 5 ho al lo 7 ho ectific	n. ur Ven ur gic
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4DigitBasic logic circuit condictioncircuits, Synthesis of IModule:5SemConduction in SemicFeedbackAmplifiers	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C ogic circuits icconductor devices and Circuits onductor materials, PN junction diodes, Zener diodes, BJTs, MC using transistors. Communication Engineering: Modulation and	cuits, I hree F , Singl BLDC Combin	Power hase hase pha mote ation s, Re	6 ho rin 2 Pow 7 ho ase a or. 5 ho al lo 7 ho ectific	n. urs Ver urs gic
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4DigitBasiclogiccircuits, Synthesis of IModule:5SemConduction in Semic	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C ogic circuits ciconductor devices and Circuits onductor materials, PN junction diodes, Zener diodes, BJTs, MC using transistors. Communication Engineering: Modulation at ency Modulation	cuits, I hree F , Singl BLDC Combin	Power hase hase pha mote ation s, Re nodul	6 ho rin 2 Pow 7 ho ase a or. 5 ho al lo 7 ho ctific	n. ur Ven ur gio
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4DigitBasiclogiccircuits, Synthesis of IModule:5SemConduction in SemicFeedbackAmplifiers	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C ogic circuits icconductor devices and Circuits onductor materials, PN junction diodes, Zener diodes, BJTs, MC using transistors. Communication Engineering: Modulation and	cuits, I hree F , Singl BLDC Combin	Power hase hase pha mote ation s, Re nodul	6 ho rin 2 Pow 7 ho ase a or. 5 ho al lo 7 ho ectific	n. ur Ven ur gio
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4DigitBasic logic circuit cocircuits, Synthesis of IModule:5SemConduction in SemicFeedback AmplifiersAmplitude and Freque	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C ogic circuits ciconductor devices and Circuits onductor materials, PN junction diodes, Zener diodes, BJTs, MC using transistors. Communication Engineering: Modulation at ency Modulation	cuits, I hree F , Singl BLDC Combin	Power hase hase pha mote ation s, Re nodul	6 ho rin 2 Pow 7 ho ase a or. 5 ho al lo 7 ho ctific	n. ur Ven ur gio
Module:2AC ofAlternating voltagescircuits-PowerFactorMeasurement – ElectModule:3ElectConstruction, WorkiThree-phaseInductionModule:4DigitBasic logic circuit cocircuits, Synthesis of IModule:5SemConduction in SemicFeedbackAmplifiersAmplitude and FrequeText Book(s)	ircuits and currents, AC values, Single Phase RL, RC, RLC Series circ r- Three Phase Systems – Star and Delta Connection- T cical Safety –Fuses and Earthing, Residential wiring. trical Machines ng Principle and applications of DC Machines, Transformers on motors, Special Machines-Stepper motor, Servo Motor and tal Systems oncepts, Representation of Numerical Data in Binary Form- C ogic circuits ciconductor devices and Circuits onductor materials, PN junction diodes, Zener diodes, BJTs, MC using transistors. Communication Engineering: Modulation at ency Modulation	cuits, I hree F , Singl BLDC Combin	Power hase e pha mote ation s, Re nodul	6 ho rin 2 Pov 7 ho ase a or. 5 ho al lo 7 ho ctific lation 30 ho	ura vei ura gic ura gic



#### VIIT<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)



Ref	erence Books:				
1.	Allan R. Hambley, 'Electrical Engin	neering -Principles	& Applie	cations' Pearson Educati	ion, First
	Impression, 6/e, 2013				
2.	Simon Haykin, 'Communication Syste	ems', John Wiley &	Sons, 5 t h	n Edition, 2009.	
3.	Charles K Alexander, Mathew N O Sa	adiku, 'Fundament	als of Elect	ric Circuits', Tata McGra	w Hill,
	2012.				
4.	Batarseh, 'Power Electronics Circuits'	, Wiley, 2003			
5.	H. Hayt, J.E. Kemmerly and S. M. I	Durbin, 'Engineeri	ng Circuit	Analysis', 6/e, Tata Mc	Graw Hill,
	New Delhi, 2011.				
7.	Fitzgerald, Higgabogan, Grabel, 'Basic	c Electrical Engine	ering', 5t h	edn, McGraw Hill, 2009.	
8.	S.L.Uppal, 'Electrical Wiring Estimati	ng and Costing ', k	Shanna pub	olishers, NewDelhi, 2008.	
Mod	le of Evaluation: CAT / Assignment / 9	Quiz / FAT / Proj	ect / Semi	nar	
List	of Challenging Experiments (Indica	,			
1.	Thevenin's and Maximum Power Tra-	nsfer Theorems – I	Impedance	matching of source and	3 hours
	load				
2.	Sinusoidal steady state Response of R				3 hours
3.	Three phase power measurement for				3 hours
4.	Staircase wiring circuit layout for mult				3 hours
5.	Fabricate and test a PCB layout for a	rectifier circuit			3 hours
6.	Half and full adder circuits.				3 hours
7.	Full wave Rectifier circuits used in	DC power supplie	es. Study t	he characteristics of the	3 hours
	semiconductor device used				
8.	Regulated power supply using zener	diode. Study the	characteris	stics of the Zener diode	3 hours
	used				
9.	Lamp dimmer circuit (Darlington pair	circuit using trans	istors) used	l in cars.	3 hours
	Study the characteristics of the transis	tor used			
10.	Characteristics of MOSFET				3 hours
			Te	otal Laboratory Hours	30 hours
	de of assessment: CAT / Assignmen	-	Project /	Seminar	
	ommended by Board of Studies	29-05-2015	Det	17.04.0015	
мрр	roved by Academic Council	No. 37	Date	17-06-2015	



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course Code		L T	P J		С
MAT1004		3 0	0 0	-	3
Pre-requisite	NIL	Syllabu		sion	
0			v. 1.0		
Course Objectives:					
The aim of this course					
	ets, functions, relations and groups concepts for analyzing	g probler	ns tha	t aris	se 11
engineering and phy					
	lyze the problems connected with combinatorics and Boolea	in algebra	ι.		
3 To solve calculus an	id integral calculus problems.				
Expected Course Ou	taomo				
1	se the student should be able to				
	s types of sets, functions and relations.				
	cepts of group theory.				
	cepts of gloup moory.				
	-				
	cepts of graph theory and its applications.				
5.Learning logic and I	Boolean algebra. Using these concepts to solve the problems	•			
Module:1 Set, F	Function and Relation			5 h	our
	Subset – Types of set – Operation of sets – Principle of in	clusion a	nd exc	lusic	n –
	- Functions – One-one and onto functions – Relations				
		- Types	01 10	iatio	11
Equivalence relations.		- Types	01 10	12110	11
Equivalence relations.					
Equivalence relations. Module:2 Algeb	oraic Structures			8 h	our
Equivalence relations. Module:2 Algeb Semigroup – Monoids	oraic Structures – Groups – Subgroups – Abelian groups – Lagrange's the			8 h	our
Equivalence relations. Module:2 Algeb Semigroup – Monoids	oraic Structures			8 h	our
Equivalence relations. Module:2 Algeb Semigroup – Monoids only) – Integral domain	oraic Structures – Groups – Subgroups – Abelian groups – Lagrange's the			<b>8 h</b> Jexan	ours
Equivalence relations.         Module:2       Algebra         Semigroup – Monoids only) – Integral domain         Module:3       Comb	oraic Structures – Groups – Subgroups – Abelian groups – Lagrange's the n – Fields – Definition and examples. pinatorics	eorem — I	Rings (	8 h (exan 8 h	ours nples ours
Equivalence relations. Module:2 Algeb Semigroup – Monoids only) – Integral domain Module:3 Comb Introduction to Basic	praic Structures – Groups – Subgroups – Abelian groups – Lagrange's the n – Fields – Definition and examples. pinatorics Counting Principles, Formulae behind nPr, nCr - Balls and	orem – I Pins prob	Rings (	<b>8 h</b> (exan <b>8 h</b> - Pig	ours nples ours eon-
Equivalence relations. Module:2 Algeb Semigroup – Monoids only) – Integral domain Module:3 Comb Introduction to Basic	<ul> <li>praic Structures         <ul> <li>Groups – Subgroups – Abelian groups – Lagrange's the</li> <li>n – Fields – Definition and examples.</li> </ul> </li> <li>pinatorics         <ul> <li>Counting Principles, Formulae behind nPr, nCr - Balls and Eurrence relations – Generating Functions - Introduction</li> </ul> </li> </ul>	orem – I Pins prob	Rings (	<b>8 h</b> (exan <b>8 h</b> - Pig	ours nples ours eon-
Equivalence relations.         Module:2       Algebra         Semigroup – Monoids only) – Integral domain         Module:3       Combined         Introduction to Basic         Hole Principle - Record	<ul> <li>praic Structures         <ul> <li>Groups – Subgroups – Abelian groups – Lagrange's the</li> <li>n – Fields – Definition and examples.</li> </ul> </li> <li>pinatorics         <ul> <li>Counting Principles, Formulae behind nPr, nCr - Balls and Eurrence relations – Generating Functions - Introduction</li> </ul> </li> </ul>	orem – I Pins prob	Rings (	<b>8 h</b> (exan <b>8 h</b> - Pig	ours nples ours eon-
Equivalence relations.         Module:2       Algebra         Semigroup – Monoids only) – Integral domain         Module:3       Combra         Introduction to Basic         Hole Principle - Reconstruction         Mathematical Induction	<ul> <li>praic Structures         <ul> <li>Groups – Subgroups – Abelian groups – Lagrange's the</li> <li>n – Fields – Definition and examples.</li> </ul> </li> <li>pinatorics         <ul> <li>Counting Principles, Formulae behind nPr, nCr - Balls and Eurrence relations – Generating Functions - Introduction</li> </ul> </li> </ul>	orem – I Pins prob	Rings (	8 h exan 8 h - Pig miqu	ours nples ours eon- ies -
Equivalence relations.         Module:2       Alget         Semigroup – Monoids         only) – Integral domain         Module:3       Combination         Introduction to Basic         Hole Principle - Reconstruction         Mathematical Induction         Module:4       Basic	<ul> <li>praic Structures         <ul> <li>Groups – Subgroups – Abelian groups – Lagrange's the</li> <li>n – Fields – Definition and examples.</li> </ul> </li> <li>pinatorics         <ul> <li>Counting Principles, Formulae behind nPr, nCr - Balls and Eurrence relations – Generating Functions - Introduction n</li> </ul> </li> </ul>	eorem – I Pins prot to Proo	Rings ( blems - f Tech	8 h éexan 8 h - Pig iniqu 4 h	ours nples ours eon- ies -
Equivalence relations.         Module:2       Algebra         Semigroup – Monoids only) – Integral domain         Module:3       Combra         Introduction to Basic         Hole Principle - Rector         Mathematical Inductio         Module:4       Basic         Graphs and digraphs	<ul> <li>oraic Structures</li> <li>– Groups – Subgroups – Abelian groups – Lagrange's the n – Fields – Definition and examples.</li> <li>oinatorics</li> <li>Counting Principles, Formulae behind nPr, nCr - Balls and arrence relations – Generating Functions - Introduction n</li> <li>Graph Theory</li> </ul>	orem – I Pins prot to Proo	Rings ( blems - f Tech	8 h exan 8 h - Pig miqu 4 h	ours nple ours eon- nes -
Equivalence relations.         Module:2       Algebra         Semigroup – Monoids only) – Integral domain         Module:3       Combra         Introduction to Basic         Hole Principle - Rector         Mathematical Inductio         Module:4       Basic         Graphs and digraphs	oraic Structures         – Groups – Subgroups – Abelian groups – Lagrange's the         n – Fields – Definition and examples.         oinatorics         Counting Principles, Formulae behind nPr, nCr - Balls and arrence relations – Generating Functions - Introduction n         Graph Theory         , complement, isomorphism, connectedness and reachal	orem – I Pins prot to Proo	Rings ( blems - f Tech	8 h exan 8 h - Pig miqu 4 h	ours nple ours eon- nes -
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Equivalence relations.Module:2AlgebSemigroup – Monoids only) – Integral domainModule:3CombIntroduction to Basic Hole Principle - Recu Mathematical InductioModule:4Basic Graphs and digraphs Eulerian paths and o tournamentsModule:5Trees	<ul> <li>praic Structures <ul> <li>Groups – Subgroups – Abelian groups – Lagrange's the</li> <li>n – Fields – Definition and examples.</li> </ul> </li> <li>pinatorics <ul> <li>Counting Principles, Formulae behind nPr, nCr - Balls and arrence relations – Generating Functions - Introduction n</li> </ul> </li> <li>Graph Theory <ul> <li>complement, isomorphism, connectedness and reachal circuits in graphs and digraphs, Hamiltonian paths and some paths and</li></ul></li></ul>	Pins prob to Proo	Rings ( plems - f Tech jacency in gra	8 h (exan 8 h - Pig nniqu 4 h y ma aphs 6 h	ours ours eon- ies atrix and
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Equivalence relations.         Module:2       Alget         Semigroup – Monoids         only) – Integral domain         Module:3       Combination         Introduction to Basic         Hole Principle - Record         Mathematical Induction         Module:4       Basic         Graphs and digraphs         Eulerian paths and cord         tournaments         Module:5       Trees         Trees; Planar graphs,	<ul> <li>praic Structures <ul> <li>Groups – Subgroups – Abelian groups – Lagrange's the n – Fields – Definition and examples.</li> </ul> </li> <li>pinatorics <ul> <li>Counting Principles, Formulae behind nPr, nCr - Balls and arrence relations – Generating Functions - Introduction n</li> </ul> </li> <li>Graph Theory <ul> <li>complement, isomorphism, connectedness and reachal circuits in graphs and digraphs, Hamiltonian paths and Exercise formula, dual of a planer graph, independence num tement of Four-color theorem</li> </ul></li></ul>	Pins prob to Proo	Rings ( plems - f Tech jacency in gra	8 h (exan 8 h - Pig nniqu 4 h y ma aphs 6 h	ours nple ours eon- ies - atrix and ours atrix



VIT® Vellore Institute of Technology

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

tables, validity and satisfiability, tautology; Adequate set of connectives; Equivalence and normal forms; Compactness and resolution; Formal reducibility - natural deduction system and axiom system; Soundness and completeness

Module:7Boolean Algebra5 hoursIntroduction of Boolean algebra, truth table, basic logic gate, basic postulates of Boolean algebra, principle<br/>of duality, canonical form, Karnaugh map.5 hours

### Module:8 Contemporary Issues

Approved by Academic Council

Industry Expert Lecture

**Total Lecture hours:** 45 hours Text Book(s) I. N. Herstein, "Topics in Algebra", John Wiley and Sons. 1. 2. M. Morris Mano, "Digital Logic & Computer Design", Pearson. 3. C. L. Liu, "Elements of Discrete Mathematics:, second edition, LiuMcGraw Hill, New Delhi. 4. J. A. Bondy and U. S. R. Murty, "Graph Theory with Applications ", Macmillan Press, London. 5. L. Zhongwan, "Mathematical Logic for Computer Science", World Scientific, Singapore **Reference Books** Gilberft Strang, "Introduction to Linear Algebra". 1. 2. R. A. Brualdi, "Introductory Combinatorics", , North-Holland, New York. 3. N. Deo, "Graph Theory with Applications to Engineering and Computer Science", Prentice Hall, Englewood Cliffs. 4. E. Mendelsohn, "Introduction to Mathematical Logic, (Second Edition)", Van-Nostrand, London. Mode of Evaluation: CAT/Quiz/Digital assignment, Seminar and FAT **Recommended by Board of Studies** 16-02-2019

Date

24-09-2019

No. 56

2 hours





				Cours	se Title				L	Τ	Р	J	С
<b>MAT2004</b>				Linear	Algebra	a			3	2	0	0	4
Pre -requisite	D	Discrete I	Mathem	atics					S	yllabı			n
											v. 1.(	)	
Course Objectives:													
The aim of this cours			-										-
. Is to cover certain					-		-	and or	thog	onalit	y cor	icept	s te
analyzing problem			0	0 1	-								
2. Is imparting to	o analyz	ze the	problem	s conn	ected E	igen va	alue, I	Iermiti	an	and	Unita	ıry li	nea
transformations.													
<b>3.</b> Is to solve QR a	and LU	J decom	position	and to	learn th	e applie	cations	of line	ear a	algebra	a in	comp	oute
science.													
Expected Course C													
At the end of the cou													
. Observe the vario	• •				-	-				1			
2. Understand the co	-	-		-		_	g by vai	ious m	ethe	ods.			
3. Understand the co	-		- ·	-									
4. Understand the co	-		•			•							
5. Learning the appli	lications	s in Imag	ge proces	sing, Ma	ichine le	arning a	nd Cry	ptograf	phy.				
		10										4.1	
		s and De			•	D	•	D 1		<u>.</u>		4 h	oui
ntroduction to Matr	trices –	Types of	Matrices	s – Dete	rminants	s – Prop	erties –	- Rank	of a	Matri	х.		
Module:2 Sy	vetem (	of Linea	r Fauati	one								4 h	0111
	ystem (	JI Linea	I Lquati	. M	rix inver	sion me	thod –	Consi	sten	rv and	linco		
Solutions of linear e	equation	ıs – Crar	ner's rule	e - war			unou	001101		ey and		,110100	CIIC
Solutions of linear e	equation	ns – Crar	ner's rule	e – Mati									
nethod.													
nethod. Module:3 LI	U Deco	omposit	ions									7 h	
nethod. Module:3 LI Gaussian elimination	<b>.U Deco</b> n – Gau	ompositi 155 Jordar	ions				matrix	– Eler	nent	ary m	atrice		
nethod. Module:3 LI	<b>.U Deco</b> n – Gau	ompositi 155 Jordar	ions				matrix	– Eler	nent	ary m	atrice		
nethod. Module:3 LI Gaussian elimination Matrices – LU Decor	<b>.U Deco</b> n – Gau ompositi	ompositi 1ss Jordan ion.	ions				matrix	– Eler	ment	ary m	atrice	es – B	loc
nethod. Module:3 LI Gaussian elimination Matrices – LU Decon Module:4 Ve	<b>.U Deco</b> n – Gau ompositi <b>/ector S</b>	ompositi iss Jordar ion.	ions n methoo	d to find	the inve	erse of a						es – B 9 h	our
nethod. Module:3 LI Gaussian elimination Matrices – LU Decon Module:4 Ve Vector space – Sub	<b>.U Deco</b> n – Gau ompositi <b>/ector S</b> space –	ompositi iss Jordan ion. paces - Linearly	<b>ions</b> n methoc y indeper	d to find	the inve	erse of a	ent – D					es – B 9 h	our
nethod. Module:3 LI Gaussian elimination Matrices – LU Decon Module:4 Ve	<b>.U Deco</b> n – Gau ompositi <b>/ector S</b> space –	ompositi iss Jordan ion. paces - Linearly	<b>ions</b> n methoc y indeper	d to find	the inve	erse of a	ent – D					es – B 9 h	ou
nethod. Module:3 LI Gaussian elimination Matrices – LU Decor Module:4 Ve Vector space – Sub of sub space – Interp	<b>JU Deco</b> n – Gau ompositi <b>Vector S</b> space – polating	ompositi iss Jordan ion. - Dinearly g polynor	<b>ions</b> n methoc y indeper	d to find	the inve	erse of a	ent – D					es – B 9 h	our our
nethod. Module:3 LI Gaussian elimination Matrices – LU Decor Module:4 Ve Vector space – Sub of sub space – Interp	U Deco n – Gau ompositi Yector S space – polating Drthogo	ompositi iss Jordan ion. paces - Linearly g polynor onality	ions n method y indeper nial vecto	d to find ndent – ors – Co	the inve linearly	erse of a depende ate vecto	ent – D ors.	Dimensi	on -	- Basis	s – D	es – B 9 h Dimen	our our
nethod. Module:3 LU Gaussian elimination Matrices – LU Decon Module:4 Ve Vector space – Sub of sub space – Interp Module:5 Or	U Deco n – Gau ompositi Yector S space – polating Drthogo	ompositi iss Jordan ion. paces - Linearly g polynor onality	ions n method y indeper nial vecto	d to find ndent – ors – Co	the inve linearly	erse of a depende ate vecto	ent – D ors.	Dimensi	on -	- Basis	s – D	es – B 9 h Dimen	our our
nethod. Module:3 LI Gaussian elimination Matrices – LU Decon Module:4 Vector space – Sub of sub space – Interp Module:5 Or Drthogonality – Pro- ransformations.	U Deco n – Gau ompositi vector S space – polating orthogo	ompositi iss Jordan ion. paces - Linearly g polynor mality n – Gran	ions n method y indepen mial vecto n Schmid	d to find ndent – ors – Co dt ortho	the inve linearly o-ordina	erse of a depende te vecto tion – 0	ent – D ors. QR de	Dimensi	on -	- Basis	s – D	es – B 9 h Dimen 6 h	oun oun nea
Module:3LlGaussian eliminationMatrices – LU DecordModule:4Vector space – SubstVector space – Substof sub space – InterpModule:5OrOrthogonality – Programsformations.Module:6H	U Deco n – Gau ompositi vector S space – polating Orthogo ojection	ompositi iss Jordan ion. paces - Linearly g polynor onality n – Gran an and U	ions n method y indepen mial vecto n Schmid	d to find ndent – ors – Co dt ortho	the inve linearly o-ordina ogonaliza	erse of a dependente vecto tion – 0 mation	ent – D ors. QR de <b>s</b>	vimensi compo	on -	- Basis n – Is	s – D some	es – B 9 h Dimen 6 h etry li 7 h	our our nea
nethod.Module:3LlGaussian elimination Matrices – LU DeconModule:4VeVector space – Sub of sub space – InterpModule:5OOrthogonality – Pro ransformations.Module:6HEigen values – Eigen	U Deco n – Gau ompositi vector S space – polating Orthogo ojection	ompositi iss Jordan ion. paces - Linearly g polynor onality n – Gran an and U	ions n method y indepen mial vecto n Schmid	d to find ndent – ors – Co dt ortho	the inve linearly o-ordina ogonaliza	erse of a dependente vecto tion – 0 mation	ent – D ors. QR de <b>s</b>	vimensi compo	on -	- Basis n – Is	s – D some	es – B 9 h Dimen 6 h etry li 7 h	oui oui nea
Module:3LlGaussian eliminationMatrices – LU DecordModule:4Vector space – SubstVector space – Substof sub space – InterpModule:5OrOrthogonality – Programsformations.Module:6H	U Deco n – Gau ompositi vector S space – polating Orthogo ojection	ompositi iss Jordan ion. paces - Linearly g polynor onality n – Gran an and U	ions n method y indepen mial vecto n Schmid	d to find ndent – ors – Co dt ortho	the inve linearly o-ordina ogonaliza	erse of a dependente vecto tion – 0 mation	ent – D ors. QR de <b>s</b>	vimensi compo	on -	- Basis n – Is	s – D some	es – B 9 h Dimen 6 h etry li 7 h	oui oui nea
nethod.Module:3LIGaussian elimination Matrices – LU DeconModule:4VeVector space – Sub of sub space – InterpModule:5OrOrthogonality – Pro ransformations.Module:6HEigen values – Eigen Fransformations.	JU Deco n – Gau ompositi vector S space – polating Drthogo ojection Hermitia n vector	ompositi iss Jordar ion. paces - Linearly g polynor onality n – Gran an and U rs – Posit	ions n method y indeper mial vecto n Schmid Unitary I tive defin	d to find ndent – ors – Co dt ortho Linear T nite matr	the inve linearly o-ordina ogonaliza	erse of a dependente vecto tion – 0 mation	ent – D ors. QR de <b>s</b>	vimensi compo	on -	- Basis n – Is	s – D some	es – B 9 h Dimen 6 h etry li 7 h l unit	oui sio oui nea oui ary
nethod.Module:3LIGaussian elimination Matrices – LU DeconModule:4VeVector space – Sub of sub space – InterpModule:5OrOrthogonality – Pro ransformations.Module:6HEigen values – Eigen Fransformations.	JU Deco n – Gau ompositi Vector S space – polating Orthogo ojection Hermitia n vector	ompositi iss Jordar ion. - Linearly g polynor onality n – Gran an and U rs – Posit	ions n method y indepen mial vecto n Schmid Unitary I tive defin	d to find ndent – ors – Co dt ortho Linear T nite matr	the inve linearly o –ordina ogonaliza <b>Fransfor</b> ices – lin	erse of a depende ate vecto tion – 0 mation hear tran	ent – D ors. QR de <b>s</b> sforma	vimensi compo utions –	on - sitio	- Basis n – Is rmitia	s – D some n and	$\frac{9 h}{2}$	oui oui nea oui ary





Mod	lule:8	Contemporary Issues				2 hours		
Indu	istry Expe	rt Lecture			·			
			Т	otal Lect	ure hours:	45 hours		
		inimum of five problems to Another five problems per tut				15 hours		
Tex	t Book(s)							
1.	Jin Ho K	wak and Snngpyo Hong, Lin	ear Algebra, Secon	d Edition,	Springer (2004).			
2.	Bernard	Kolman and David R. Hill, Ir	troductory Linear	Algebra –	An Applied Cour	se, 9 <sup>th</sup> Edition,		
	Pearson	Education, 2011.						
Refe	erence Boo	lks						
1.	Gilbert St	rang, Introduction to linear a	lgebra, 4 <sup>th</sup> Edition,	Academic	e Press.			
2.	Howard A	Anton and Robert C Busby, C	ontemporary Line	ar Algebra	, John Wiley (2003	3).		
3.	R C Gonz	zalez and R E Woods, Digital	Image Processing.					
4.	https://machinelearningmastery.com/introduction –matrices –machine –learning/							
Moc	le of Evalu	ation: CAT, Quiz, Digital a		inar and l	FAT			
		d by Board of Studies	16-02-2019					
App	roved by A	cademic Council	No. 56	Date	24-09-2019			



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course code	Course Title	L	Τ	Ρ	J	С
MAT2005	Data Science and Statistical Modelling	2	0	2	0	3
Pre-requisite	MAT 1017	9	Syllab			n
0.011				v. 1.0		
Course Objectives:						
1	of statistics in business					
-	lge on collection, analysis and presentation of data					
	itions and relationships of real-time data.	1		c	ı ·	
	on and testing methods to make inference and modeling to	ecnr	iiques	for	decis	1011
making.						
Expected Course O	<b>Dutcome:</b> After completing the course, the student should be al	hle t	0			
1. Present and analyz			0			
2. Solve problems on						
3. Interpret statistical						
4. Design and analyze						
e ;	lications of statistical methods in science and engineering					
	istical analysis to experimental data					
o. rippiy relevant stat	istear analysis to experimental data					
Module:1	Linear Statistical Models				4 ho	ours
Simple linear regressi	on & correlation, multiple regression & multiple correlation					
1 0	, 1 0 1					
Module:2	Estimation				6 ha	
Point estimation, crit	eria for good estimates (un-biasedness, consistency), Methods	of e	estima	tion	inclu	ding
maximum likelihood	estimation.					
Module:3	Sufficient Statistic				4 ho	ours
Concept & examples	, complete sufficiency, their application in estimation					
Module:4	Test of hypothesis				8 ho	Jurs
	tion, Type I and Type II errors, Neyman Pearson lemma,	Pro	cedur	es o		
-	(one way, two way with as well as without interaction)					0,
Module:5	Non-parametric Inference				6 ho	ours
Comparison with par	ametric inference, Use of order statistics. Sign test, Wilcoxon si	igne	d ranl	x test,	Mar	ın-
Whitney test, Run test	st, Kolmogorov-Smirnov test. Spearman's and Kendall's test.					
Module:6	Expert Lecture				2 ho	
	Total Lecture hour	rs:		-	30 ha	ours
Text Books						
	Statistics for Engineers (4th Edition), I.R. Miller, J.E. Freund a		R. Joł	nnson	l <b>.</b>	
2. Fundamentals	of Statistics (Vol. I & Vol. II), A. Goon, M. Gupta and B.Dasgu	upta				
2 /T <sup>1</sup> - A 1	Time Society An Introduction Chris Cl. (C. 11					
3. The Analysis o	f Time Series: An Introduction, Chris Chatfield					



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luction to Linear Regression Analy- luction to the Theory of Statistics, ed Regression Analysis, N. Draper s-on Programming with R,- Garre Everyone: Advanced Analytics an <b>Source</b> : www.rbi.org.in eriments luction to R software Understandi- buting Summary Statistics /plot nical Representations. ing correlation and simple linear reting the coefficient of determina	, A.M. Mood, F.A. r & H. Smith tt Grolemund d Graphics, Jared ing Data types; im ting and visualiz	. Graybill& P. Lander porting/en ing data	k D.C. Boes. xporting data. using Tabulation and	1 hours 2 hours
ed Regression Analysis, N. Draper s-on Programming with R,- Garre Everyone: Advanced Analytics an <b>Source</b> : www.rbi.org.in <b>Therefore and Source</b> : www.rbi.org.in <b>Interments</b> Huction to R software Understanding buting Summary Statistics /plot nical Representations. ring correlation and simple linear	r & H. Smith tt Grolemund d Graphics, Jared ing Data types; im ting and visualiz	P. Lander porting/en ing data	xporting data. using Tabulation and	
s-on Programming with R,- Garre Everyone: Advanced Analytics an <b>Source</b> : www.rbi.org.in eriments luction to R software Understandio buting Summary Statistics /plot nical Representations. ring correlation and simple linear	tt Grolemund d Graphics, Jared ing Data types; im ting and visualiz	porting/ex ing data	xporting data. using Tabulation and	
Everyone: Advanced Analytics an Source: www.rbi.org.in eriments duction to R software Understandio outing Summary Statistics /plot nical Representations. ring correlation and simple linear	d Graphics, Jared ing Data types; im ting and visualiz	porting/ex ing data	xporting data. using Tabulation and	
Source: www.rbi.org.in eriments luction to R software Understandi- outing Summary Statistics /plot nical Representations. ring correlation and simple linear	ing Data types; im ting and visualiz	porting/ex ing data	xporting data. using Tabulation and	
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luction to R software Understandiouting Summary Statistics /plot nical Representations. ring correlation and simple linear	ting and visualiz	ing data	using Tabulation and	
luction to R software Understandiouting Summary Statistics /plot nical Representations. ring correlation and simple linear	ting and visualiz	ing data	using Tabulation and	
outing Summary Statistics /plot nical Representations. ring correlation and simple linear	ting and visualiz	ing data	using Tabulation and	
nical Representations.	regression mode	e	0	2 hours
ing correlation and simple linear		l to real d		
	ation		lataset; computing and	1 hours
ing multiple linear regression mo ble coefficient of determination		; computin	ng and interpreting the	2 hours
ng of hypothesis for One sample r	nean and proporti	on from r	eal-time problems.	1 hours
ng of hypothesis for Two sample i	mean and proporti	ion from r	eal-time problems	2 hours
rming ANOVA for real dataset fo				2 hours
square Design				1 hours
parametric Sign test and Wilcoxon	signed rank test			2 hours
-Whitney test				1 hours
	Continuous Asse	ssmente	Seminar and FAT	
valuation. Assignments ()1117 (		55mcm6,		
<b>U</b>	16-02-2019			
	-Whitney test valuation: Assignments, Quiz, Quiz	-Whitney test valuation: Assignments, Quiz, Continuous Asse	-Whitney test valuation: Assignments, Quiz, Continuous Assessments,	





Course Code	Course Title	L	Τ	Р	J	С
MGT1064	Financial And Cost Accounting	3	0	0	0	3
Pre-requisite	NIL		Syl	labu	s ver	sio
				v. 1.	0	
Course Objectives:						
1. To create an av	vareness about the importance and usefulness of the account	ting	conc	epts	and	the
managerial impl	ications					
2. To develop an	understanding of the financial statements and the underlying	prin	ciple	s and	d lear	n t
interpret financi	al statements					
<b>3.</b> To create an aw	areness about cost accounting, different types of costing and co	ost m	anag	eme	nt	
				,		
Expected Course C	Jutcome:					
After completion of	of the course, student should be able to					
	ding Technocrat Managers to understand the Financial Account	ting	Conc	epts		
2. Process the acco	ounting transactions leading to final statement of accounts					
3. Analyze the Ana	nual Reports					
4. Prepare the FFS	and CFS					
5. Understand the	Costing concepts and make decisions using Marginal costing co	once	pts a	nd b	ıdget	S
			-		0	
	troduction				2 h	
	: Introduction, Techniques and Conventions, Financial Statem	nents	- Un	derst	andir	ng b
Interpreting Financia	.l Statements					
					<u> </u>	
	ccounting Process			- <b>T</b>	<u>6 h</u>	
1 0	Record Maintenance, Fundamental Principles and Double Entrand Subsidiary Books, Rectification of Errors.	y, Jo	urnal	l, Leo	iger,	l r1;
Module:3 Fi	nancial Statements				12 h	our
Form and Contents	of Financial Statements- Trading and Profit and Loss Accoun	t, Ba	lance	e She		
	Ind Interpreting Financial Statements, Accounting Standards.					
Module:4 Co	ompany Accounts				3 h	our
Audit Reports and S	tatutory Requirements (in the context of Annual Reports), Dire	ector	s Re	port,	Note	es t
Accounts, Pitfalls. C	ass Discussion: Corporate Accounting Fraud A Case Study of S	Satya	m			
	ash and Fund Flow				8 h	our
Introduction, How to	o prepare, Difference between them					
<u>M 11(</u>					(1	
	osting Systems			- C -	6 h	
	Cost Behavior, Cost Allocation, OH Allocation, Unit Costing Costing, ABC Analysis.	g, Pr	ocess	s Co	sting,	. 10
· 1	plication of costing concepts in the Service Sector					
	× × ·				0.1	
Module 7 D	ecision Making using costing				8 h	oui
Manainal Casting C	NEL VINITURE PERMIT ATTUIVETE BUILDEFE					
Marginal Costing -Co	Set volume 1 tone renarysis-Daugets					
Marginal Costing -Co	Total Lecture hours:	:			45 h	ou



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Approved by Academic Council

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Date

13-06-2019

Tex	Text Book(s)							
1.	Robert N Anthony, David Hawkins, Kenneth Marchant, Accounting: Texts and Cases, McGraw-Hill							
2.	Case Study Materials: To be distributed for class discussion							
Ref	erence Books							
1.	Advanced Accounting by RL Gupta and Radhaswamy							
2.	Advanced Accounting by MC Shukla and Grewal							
Mo	Mode of Evaluation: CAT / Assignment / Quiz / FAT							
Rec	Recommended by Board of Studies 07-06-2019							

No. 55



#### VIIC \*\* Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	Course Title	L	Τ	Р	J	С
MGT 1065	Fundamentals of Management	3	0	0	0	3
Pre-requisite	NIL		Sylla			sio
				v. 1.(	)	
	: To develop the ability to					
	nagement theories, evolution of management over the years and	d ba	asics	cone	cept	5 C
Management.						
-	rstanding about how organizations work					
3.Exlpore the intrica	acies of different management areas such as finance, marketing, stra	ateg	y etc			
Expected Course		Dala				
0	the basic theoretical concepts of Management and Organisational I	Den	aviot	11		
0	d linking the concepts with contemporary issues					
	me management problems, analyse them, and find solutions					
1	bit cross-cultural competencies by working in teams.					
5.Develop manageri	ial skills needed to become an effective manager.					
Module:1 N	Ianagement Theories				8 ha	
	indations of Management, Evolution of Management Thou	noht	ts Π			
	before 1880), Classical management Era (1880-1930), Neo-classic					
			IVIAII			E1
					Tav	
(1930-1950), Moder	rn Management era (1950-on word). Contribution of Manageme				Tay	
(1930-1950), Moder	rn Management era (1950-on word). Contribution of Manageme				Tay	
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F	rn Management era (1950-on word). Contribution of Manageme etc. Functions of Management			kers:	Тау 6 hc	/lo
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F	rn Management era (1950-on word). Contribution of Manageme etc.			kers:		/lo
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling			kers:	6 ho	vlo oui
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Organization Behavior	ent '	Thin	kers:	6 ha	oui
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Drganization Behavior Inality, Perception, Learning and Reinforcement, Work Stress and	ent '	Thin	kers:	6 ha	oui
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Organization Behavior	ent '	Thin	kers:	6 ha	our
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso Decision Making, Pr	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Drganization Behavior Inality, Perception, Learning and Reinforcement, Work Stress and	ent '	Thin	kers: Mana	6 ha	our our en
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso Decision Making, Pr Module:4 C	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Drganization Behavior nality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making	ent '	Thin ress 1	kers: Mana	6 hc gem	
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso Decision Making, Pr Module:4 C Classical, Neoclassie	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Drganization Behavior mality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Drganizational Design	ent '	Thin ress M	kers: Mana	6 hc gem 6 hc ory	vlo oui en oui an
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso Decision Making, Pr Module:4 C Classical, Neoclassie design, Organizatio	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Drganization Behavior nality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Drganizational Design cal and Contingency approaches to organizational design; Organ	ent '	Thin ress M	kers: Mana	6 hc gem 6 hc ory	vlo oui en oui an
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso Decision Making, Pr Module:4 C Classical, Neoclassie design, Organizatio Structure)	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Drganization Behavior mality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Drganizational Design cal and Contingency approaches to organizational design; Organ onal structure (Simple Structure, Functional Structure, Division	ent '	Thin ress M	kers: Mana l the ture,	6 ho gem 6 ho ory Ma	oui en uitri
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso Decision Making, Pr Module:4 C Classical, Neoclassid design, Organizatio Structure) Module:5 M	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Organization Behavior mality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Organizational Design cal and Contingency approaches to organizational design; Organi- onal structure (Simple Structure, Functional Structure, Division Motivation &Organisational culture	ent '	ress M tiona	Mana	6 ho gem 6 ho ory Ma	our our en our an utri
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso Decision Making, Pr Module:4 C Classical, Neoclassid design, Organizatio Structure) Module:5 M	rn Management era (1950-on word). Contribution of Management etc. Functions of Management ag, Staffing, Directing, Controlling Drganization Behavior mality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Drganizational Design cal and Contingency approaches to organizational design; Organ onal structure (Simple Structure, Functional Structure, Division	ent '	ress M tiona	Mana	6 ho gem 6 ho ory Ma	vlo oui en an utri
(1930-1950), Moder Fayol, Elton Mayo e Module:2 F Planning, Organizin Module:3 C Introduction, Perso Decision Making, Pr Module:4 C Classical, Neoclassid design, Organizatio Structure) Module:5 M Motivation, Group	rn Management era (1950-on word). Contribution of Management etc. Functions of Management Ig, Staffing, Directing, Controlling Drganization Behavior mality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Drganizational Design cal and Contingency approaches to organizational design; Organi- onal structure (Simple Structure, Functional Structure, Division Motivation &Organisational culture Dynamics, Power & Influence, Organizational Culture, Managing O	ent '	ress M tiona	kers: Mana l the ture, Dive	6 hc gem 6 hc ory Ma 5 hc	oui en oui an utr:
(1930-1950), Moder         Fayol, Elton Mayo e         Module:2       F         Planning, Organizin         Module:3       C         Introduction, Perso         Decision Making, Pr         Module:4       C         Classical, Neoclassic         design, Organizatio         Structure)         Module:5       N         Module:6       N	rn Management era (1950-on word). Contribution of Management etc. Functions of Management Ig, Staffing, Directing, Controlling Drganization Behavior mality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Drganizational Design cal and Contingency approaches to organizational design; Organi- onal structure (Simple Structure, Functional Structure, Division Motivation &Organisational culture Dynamics, Power & Influence, Organizational Culture, Managing O Managerial Ethics	ent '	Thin ress M tiona Struc	kers: Mana l the ture, Dive	6 hc 6 hc gem 6 hc ory Ma 5 hc	oui en oui an atri
(1930-1950), Moder         Fayol, Elton Mayo e         Module:2       F         Planning, Organizin         Module:3       C         Introduction, Perso         Decision Making, Pr         Module:4       C         Classical, Neoclassid         design, Organizatio         Structure)         Module:5       M         Motivation, Group         Module:6       M	rn Management era (1950-on word). Contribution of Management etc. Functions of Management Ig, Staffing, Directing, Controlling Organization Behavior mality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Organizational Design cal and Contingency approaches to organizational design; Organical and Contingency approaches to organizational design; Organical is, Power & Influence, Organizational Culture, Managing Managerial Ethics is, Ethics of Marketing & advertising, Ethics of Finance & Acc	ent '	Thin ress M tiona Struc	kers: Mana l the ture, Oive ( ) Dive	6 hc gem 6 hc ory Ma 5 hc cisio	vlo oui en oui an atri
(1930-1950), Moder         Fayol, Elton Mayo e         Module:2       F         Planning, Organizin         Module:3       C         Introduction, Perso         Decision Making, Pr         Module:4       C         Classical, Neoclassic         design, Organizatio         Structure)         Module:5       M         Motivation, Group         Module:6       M         Ethics and Busines         making frameworks	rn Management era (1950-on word). Contribution of Management etc. Functions of Management Ig, Staffing, Directing, Controlling Organization Behavior nality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Organizational Design cal and Contingency approaches to organizational design; Organ onal structure (Simple Structure, Functional Structure, Division Motivation &Organisational culture Dynamics, Power & Influence, Organizational Culture, Managing Managerial Ethics s, Ethics of Marketing & advertising, Ethics of Finance & Acc s, Business and Social Responsibility, International Standards, Co	ent '	Thin ress M tiona Struc	kers: Mana l the ture, Oive ( ) Dive	6 hc gem 6 hc ory Ma 5 hc cisio	vlo oui en oui an atri
(1930-1950), Moder         Fayol, Elton Mayo e         Module:2       F         Planning, Organizin         Module:3       C         Introduction, Perso         Decision Making, Pr         Module:4       C         Classical, Neoclassical         design, Organizatio         Structure)         Module:5       M         Motivation, Group         Module:6       M         Ethics and Busines         making frameworks	rn Management era (1950-on word). Contribution of Management etc. Functions of Management Ig, Staffing, Directing, Controlling Organization Behavior mality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Organizational Design cal and Contingency approaches to organizational design; Organical and Contingency approaches to organizational design; Organical is, Power & Influence, Organizational Culture, Managing Managerial Ethics is, Ethics of Marketing & advertising, Ethics of Finance & Acc	ent '	Thin ress M tiona Struc	kers: Mana l the ture, Oive ( ) Dive	6 hc gem 6 hc ory Ma 5 hc cisio	n n n n n n n n n n n n n n n n n n n
(1930-1950), Moder         Fayol, Elton Mayo e         Module:2       F         Planning, Organizin         Module:3       C         Introduction, Perso         Decision Making, Pr         Module:4       C         Classical, Neoclassic         design, Organizatio         Structure)         Module:5       M         Motivation, Group         Module:6       M         Ethics and Busines         making frameworks         Corporate Citizensh	rn Management era (1950-on word). Contribution of Management etc. Functions of Management Ig, Staffing, Directing, Controlling Organization Behavior nality, Perception, Learning and Reinforcement, Work Stress and roblems in Decision Making, Decision Making Organizational Design cal and Contingency approaches to organizational design; Organ onal structure (Simple Structure, Functional Structure, Division Motivation &Organisational culture Dynamics, Power & Influence, Organizational Culture, Managing Managerial Ethics s, Ethics of Marketing & advertising, Ethics of Finance & Acc s, Business and Social Responsibility, International Standards, Co	ent '	Thin ress M tiona Struc	Mana Mana l the ture, Oive Gove	6 hc gem 6 hc ory Ma 5 hc cisio	vlo oui en oui en oui an atri n





Mo	dule:8	Contemporary issues				2 hours			
Con	ntemporary is	sues in Management							
Lab	Experimer	nts:NIL							
			T	otal Lectu	re hours:	30 hours			
					ŀ				
Tex	xt Book(s)								
1.	Richard L.	Daft, Understanding the Th	eory and Design of	f Organiza	tions				
2.	Stephen P. Robbins, Timothy A. Judge, Neharika Vohra, Organizational Behavior								
3.	Harold Ko	oontz, Essentials of Managen	nent						
Ref	erence Bool	<b>K</b> 8							
1.	Cyril J. C	'Donnell and Harold Koo	ntz, Principles of	Managem	ent: An Analysi	s of Managerial			
	Functions								
2.	Arnold Ba	kker, Positive Interventions	in Organizations						
3.	Journals- A	Academy of Management Jou	ırnal, Journal of Ma	anagement	, HBR				
Mo	de of Evalua	ation: CAT / Assignment ,	/ Quiz / FAT / L	lab					
Rec	commended	by Board of Studies	07-06-2019						
Apr	proved by A	cademic Council	No. 55	Date	13-06-2019				



#### VIIT<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Course Code	Course Title		L	T	Р	J	С
MGT2002	Marketing Research & Marketing Man	agement	3	0	0	0	3
Pre-requisite	NIL			Sylla			ion
					v. 1.(	)	
Course Objectives:	and the need of study of Marketing and Marketi	ng Rosporch					
1	. 8	ng Kesearch					
	kill into real world problems						
5. Utilize marketing ma	anagement tools for competitive advantage						
Expected Course Ou	tcome						
<u>.</u>	marketing concepts						
	dynamics of marketing and analyze how its va	ious componer	nts i	ntera	ict w	ith e	ach
other in the real w		nous componer	100 1				
	ng concepts for effective decision making						
8	concepts and application of statistical tools in m	arketing researc	-h				
	concepts and appreadon of statistical tools in n	and the former and the search	-11				
Module:1 Mark	eting Concepts					8 ho	urs
	ad Applications: Introduction to Marketing & C	ore Concepts. N	Nark	teting			
0 1	ing in service sector. Marketing Planning & Er	1 .			-		
-	& trends in Environment - Macro, Econo						_
	onsumer: Determinants of consumer behav						
0	entation: Meaning & Concept, Basis of segment				0		
_	s, Target Marketing, Product Positioning	auon, selection	UI I	segn	icitits <sub>:</sub>	, IVIA	INCI
Segmentation strategies	s, rarget marketing, Froduct Fositioning						
Module:2 Produ	act Decisions					6 ho	ours
Product Management:	Product Life cycle concept, New Product dev	elopment & str	ateg	v. St			
_	Product decision and strategies, Branding & pac	-	c	,,, .,			
,							
Module:3 Price,	Place and Promotion Decisions					6 ho	ours
	und Distribution Strategy: Policies & Pract	ices – Pricing	M	etho			
-	Marketing Communication – The promotion n	-					
	ent. Marketing Channels, Retailing, Marketing Co	. 0			•		
	III. Markeung Channels, Retaining, Markeung Co		Adv	ertisi	ng.		
	int. Marketing Channels, Retaining, Marketing Co		Adv	ertisi	ng.		
Advertising Manageme	eting Research		Adv	ertisi		6 ha	ours
Advertising Manageme Module:4 Mark							
Advertising Manageme Module:4 Marketing Research: In	eting Research	Objectives & I	imi	tatio	ns M	arke	ting
Advertising Manageme Module:4 Marketing Research: In	eting Research ntroduction, Type of Market Research, Scope,	Objectives & I	imi	tatio	ns M	arke	ting
Advertising Manageme Module:4 Marketing Research: In Research Techniques,	eting Research ntroduction, Type of Market Research, Scope,	Objectives & I	imi	tatio	ns M	arke	ting
Advertising Manageme Module:4 Marketing Research: In Research Techniques, Qualitative Research.	eting Research ntroduction, Type of Market Research, Scope,	Objectives & I	imi	tatio	ns M ia R	arke	ting rch,
Advertising Manageme Module:4 Marketing Research: In Research Techniques, Qualitative Research. Module:5 Market	eting Research ntroduction, Type of Market Research, Scope, Survey Questionnaire design & drafting, I	Objectives & L Pricing Researc	.imi ch,	tation Med	ns M ia R	arke esea 6 ho	ting rch, ours
Advertising Manageme Module:4 Marketing Research: In Research Techniques, Qualitative Research. Module:5 Marketing Research &	eting Research ntroduction, Type of Market Research, Scope, Survey Questionnaire design & drafting, eting Research & Data Analysis	Objectives & I Pricing Researc – Descriptive 8	Limit ch, ck In	tation Med	ns M ia R nce S	arke esea 6 ho tatis	ting rch, ours
Advertising Manageme Module:4 Marketing Research: In Research Techniques, Qualitative Research. Module:5 Marketing Research &	eting Research ntroduction, Type of Market Research, Scope, Survey Questionnaire design & drafting, eting Research & Data Analysis Data Analysis: Use of various statistical tools Γesting, Multivariate Analysis - Discriminant A	Objectives & I Pricing Researc – Descriptive 8	Limit ch, ck In	tation Med	ns M ia R nce S	arke esea 6 ho tatis	ting rch, ours tics,
Advertising Manageme Module:4 Marketing Research: In Research Techniques, Qualitative Research: Module:5 Marketing Research & Statistical Hypothesis T	eting Research ntroduction, Type of Market Research, Scope, Survey Questionnaire design & drafting, eting Research & Data Analysis Data Analysis: Use of various statistical tools Γesting, Multivariate Analysis - Discriminant A	Objectives & I Pricing Researc – Descriptive 8	Limit ch, ck In	tation Med	ns M ia R nce S	arke esea 6 ho tatis	ting rch, ours



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Int	ernet Marke	ting: Introduction to Interne	t Marketing. Mapp	ing fundan	nental concepts of I	Marketing (7Ps,
ST	P); Strategy a	and Planning for Internet Ma	arketing.			
Mo	odule:7	B2B Marketing				5 hours
Bus	siness to B	usiness Marketing: Fundan	nental of busines	s markets.	Organizational b	uying process.
Bus	siness buyer	needs. Market and sales po	tential. Product in	business n	narkets. Price in bu	siness markets.
Pla	ce in busin	ness markets. Promotion	in business mark	ets. Relati	onship, networks	and customer
rela	itionship ma	nagement. Business to Busin	ess marketing strat	egy.		
		-				
Mo	odule:8	Contemporary issues				2 hour
Co	ntemporary	topics in marketing				
				Tota	l Lecture hours:	45 hours
	xt Book(s)					_
1.	0	Management (2019), Philip I				
2.	Marketing	Management (2019), Deepal	x, R. Kanthiah Alia	s, and S. Je	yakumar, Educreati	on Publishing
3.	Marketing	Management: A relationship	approach (2019), l	Hollensen,	S, Pearson Educati	on.
4.	Marketing	research: An applied approa	ch (2019), Malhotr	a, N. K., N	Junan, D., & Birks,	D. F. ,Pearson
	Education	Limited.				
Re	ference Boo	oks				
1.	Marketing	research: Text and cases (202	20), Nargundkar, R	, McGraw-	-Hill Education.	
2.	Marketing	management: A cultural pers	spective (2020), Vis	conti, L. N	I., Peñaloza, L., & 🛛	Гoulouse, N.
	(Eds.) Rou	tledge.				
	<u> </u>					
Mo	ode of Evalu	ation: CAT / Assignment	t / Quiz / FAT			
		d by Board of Studies	29-01-2021			
Ap	proved by A	Academic Council	No. 61	Date	18-02-202	1



#### VITC<sup>•</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

MGT2003 Pre-requisite	Financial Management	3	0	0	0	2
Pre-requisite					-	3
1	NIL		Sylla		vers	io
			V	. 1.0		
Course Objectives:						
	damental concepts of financial management					
	ncepts such as time value of money, cost of capital, risk and	retur	n, wo	orking	g cap	oit
management, capita	0 0					
3. Leverage the concept	ot for deciding financial angle of IT projects					
Expected Course Ou						
Students will be able to			taca	agent	0.000	J 4
	ing Technocrat Managers to understand the Financial Manag			icept	s and	ιL
11	epts of "time value of money" in the decision-making process. ies and know the concept of Risk and return					
	1				m to	
	verage", "cost of capital" and the projects using the Capital b	0	0		pts	
	Capital components, their implications and Working Capital re	quire	ment	s.		
5. To analytically view	the Components of Working Capital.					
Module:1 Intro	duction				2 ho	
	action to Financial Management - Goals of the firm - Financia	East				
	tion of Securities / Risk & return				0 ho	
	es: Bond Valuation, Preferred Stock Valuation, Common Sto	ock V	aluat	ion, (	Cond	cep
of Yield and YTM.						
	ning Risk and Return, Using Probability Distributions to M					
	d Return in a Portfolio Context, Diversification, The Capita	al Ass	set P	ricing	g Mo	bd
(CAPM)						
					(1	
	rage / Cost of Capital ial Leverage: Operating Leverage, Financial Leverage, Total	Larra			6 ho	
	udy <b>Cost of Capital</b> : Concept, Computation of Specific Cost					
	eighted Average Cost of Capital – Factors affecting Cost of Ca		apitai	101	Equ	цy
Preference – Debt, we	agnied Average Cost of Capital – Factors affecting Cost of Ca	ipital.				
Module:4 Capit	al budgeting				4 ho	ut
	g Concept & Process - An Overview, Generating Investm	ent I	Projec			
1 0 0	fter Tax Incremental Operating Cash Flows, Capital Budgeti				-	
e ,	on - Alternative Methods	0		1 /		,
Module:5 Work	ing Capital Management:				3 ho	u
0	Capital Issues, Financing Current Assets (Short Term ar ructures and Current Asset Decisions, Estimation of Working		0	Гerп	n- N	lix



## Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Module:6	Cash Management:				9 hours
Motives fc	r Holding cash, Speeding U	p Cash Receipts	, Slowing	Down Cash Payou	uts, Electronic
Commerce	Outsourcing, Cash Balances t	o maintain, Factor	ing		
Module:7	Accounts Receivable Ma	anagement:			11 hours
Credit & Co	llection Policies, Analyzing the	0	, Credit Re	ferences, Selecting of	optimum Credit
period.	· · · · ·	11	,	<i>,</i> 0	1
1					
			Total l	Lecture hours:	45 hours
Text Book(	s)				
	a, Prasanna - Financial M	lanagement - T	heory &	Practice, Prentice	Hall/Pearson
1. Chandra	i, Frasanna - Financiai IV.	0	2	,	11an/1 caroon
	on.(2019)		,	,	Than, Tourson
Educati	on.(2019)			-	
Educati	·			-	
Education 2. I.M. Part	on.(2019)	7ikas Publishing H		-	
Education 2. I.M. Part Mode of Ev	on.(2019) ndey, Financial Management, V	7ikas Publishing H		-	





Course Code	Course Title	L	T	Р	J	С
MGT3016	Services Science and Service Operations Management	2	0	2	0	3
Pre-requisite	NIL		Sylla	bus	vers	ion
			V	r. 1.0		
Course Object		1		- 1		
	examines the management of services focusing on both the strategic ar	id op	erati	onal	aspe	cts
of designing		~~ .			-	
1	essing and improving service quality, improving the efficiency and e	ttecti	vene	ss of	serv	/1C6
processes						
3. Helps in und	erstanding the integration of new technologies into service operations.					
Expected Cou	ra Quitanna					
<u> </u>	nd concepts about Services and distinguish it from Goods					
	characteristics and nature of Services					
-	d ways to design Services and evaluate them using Service qualities					
1	o understand various methods to be used to operate and manage Serv.	ice h	usine	sses		
	nd how innovation can be approached from Services point of view		usine	0000		
	ar with the tools and techniques used for designing and managing the	servi	ce or	erat	ions	
	ar with the tools and teeningdes used for designing and managing the	50111		<i>i</i> at.	10113.	
Module:1	Introduction to services				4 ho	ur
Introduction to	the course, introduction to service operations, role of service in	econ	omv	and	soci	etv
	Indian service sector, differences between services and operati					
				-		0
characteristics,	various frameworks to design service operation system, kind of	of se	ervice	ene	coun	ter
importance of e	encounters					
Module:2	Service Design				5 ho	urs
	ant Logic, Goods-Dominant logic to Service-Dominant logic, Value (	Co-ci	eatio			
	ervice Design, Design Thinking methods to aid Service Design, Dev					
	(SSV), Data Envelopment Analysis, NSD cycle, Service Blueprinting	-				~
delivery system						
Module:3	Quality and Yield Management				4 ho	
Models of facil	ity locations (Huff's retail model), role of service-scape in layout desig	gn, Sl	ERV	QUA	L, w	all
through audit, c	limensions of service quality & other quality tools					
Module:4	Service Guarantee & Service Recovery				4 ho	
	ee, benefits, types, design of service of guarantees, service failure, serv	nce 1	ecov	ery, s	strate	gy
customer respo	nse analysis.					
Module:5	Forecasting, Managing Capacity and facilities				4 ho	ur
	mand for Services, review of different types of forecasting methods, 1	nana	ging			
	gies for matching capacity and demand, psychology of waiting, applic					
	ng waiting line in services, managing facilitating Goods, review of inv					
inventory in ser						
2						



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#### CURRICULUM (2022 - 2023)

Ma	dular	Samias Sumply Oussian	Madala			1 h 0.1.40
	dule:6	Service Supply, Queuing		1 1	· /1 1 C	4 hours
		ice supply relationship: Un				
	0 0 11	liers of service, Vehicle Re	6	00		
serv	fices that my	volve transportation of peopl	le and venicle, Tec	ninques to	opunizing ver	incle foutes
Mo	dule:7	Service Innovation				3 hours
		ctivity, Need for Services Inn	ovation. Case stud	lies.		0 110 410
			,,			
Mo	dule:8	Contemporary Issues				2 hours
Gu	uest lecture l	by Industry Experts or R&D	organization			
			0	Total le	ecture hours	30 hours
					L.	
Tex	kt Book					
1.	Fitzsimmo	ns & Fitzsimmons, Service	Management: Op	erations, S	trategy, Inform	nation Technology,
	2019, 9 <sup>th</sup> ec	lition, McGraw Hill publicati	ions.			
Ref	erence Boo	oks				
1.	Wilson, A.	, Zeithaml, V. A., Bitner, M.	. J., &Gremler, D.	D. Service	es marketing: In	tegrating customer
		ss the firm. 2012. McGraw H	1			
2.		en, and Lovlie, Lavrans, Serv		usiness: A l	Practical Guide	to Optimizing the
	Customer	Experience, 2016, Pan Macm	nillan India.			
		ation: CAT / Assignment	/ Quiz / FAT /	Project /	Seminar	
	t of Experin					
1.	0	ew super market in a cosmop	• •		-	•
	levels, expe	erimental design, presentation	n of alternatives to	responden	its and estimatic	on of choice
	model)					
2.	Choose any	y service organization and pr	resent it from the p	erspective	of nature of ser	vice, classification
	of service,	blueprint or service design a	nalysis, and service	e quality.		
3.		ervice blueprint for a fast for		1 7		
4.	I	, software, user and mashup		e a next gen	service oriente	d architecture.
5.		eview article after analysing 5				
		ck on the same.	p -p			
6.		Fortune 500 company in digit	al media and point	out how t	hese technologi	es could be
0.	2	1, 0	1	. Out now u	nese teennologi	
7	,	used in a startup in digital sp			· .11	1 C
7.	•	e booking policy of an intern	0 1		0	rage number of no
		0%, explain why the best ove	-	-	=	
		comparative chart analysing a		ery agencie	s and rank then	n based on
8.	reliability, 1	esponsiveness, assurance, an	id empathy.			
					Total	Hours 30Hours
		ation: Assessments/Midt				
		d by Board of Studies	22-05-2021		ſ	
App	proved by A	Academic Council	No. 62	Date	19-07-	2021



B. Tech Computer Science and Engineering and Business Systems

# **PROGRAMME ELECTIVE**

# (AY 2021 - 2022)

B. Tech. Computer Science and Engineering and Business Systems

(in collaboration with TCS)



Sl.No.	Course Code	Course Title	Page No.
1.	CBS1011	Programming in Python	65
2.	CSE1007	JAVA Programming	67
3.	CBS3005	Cloud, Microservices and Applications	70
4.	CBS3006	Machine Learning	72
5.	CBS3007	Data Mining and Analytics	74
6.	CBS3008	Introduction to Internet of Things	77
7.	CBS3009	Advanced Social, Text and Media Analytics	79
8.	CBS3010	Mobile Computing	81
9.	CBS3013	Conversational Systems	83
10.	CBS3014	Modern Web Applications	85
11.	CBS3015	Information Systems Audit and Control	87
12.	CBS3016	Cognitive Science and Analytics	89
13.	CBS4001	Robotics and Embedded Systems	92
14.	CBS4002	Cryptology and Analysis	94
15.	CBS4003	Quantum Computation and Quantum	96
		Information	
16.	CBS4004	Image Processing and Pattern Recognition	98
17.	CBS4005	Enterprise Systems	100



Course c	ode			Cour	rse Title	e				L	Т	Р	J	С
CBS10	11		Pro	gramm	ing in F	Python	า			2	0	2	0	3
Pre-requi	isite	NIL								S	yllat	ous v	vers	io
													v.	1.
Course Ob	jectives	S:												
1. To	provide	e exposure to	basic pro	oblem-so	olving te	echniqu	ues wi	th con	nputer	s				
2. To	develop	the logical	thinking a	abilities a	and to p	ropose	e nove	l solut	ions fo	or re	al wo	orld		
-		hrough prog	-											
3. То	deepen	the empirica	al knowle	dge on a	applying	progra	ammir	ng on l	ousines	ss do	omai	ns.		
<b>F</b>		0												
Expected (			:	C (1 1	1 / /		1		• 1					
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		ough reusabl				<i>.</i>	. 1							
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-	-	exemplary ap	_			-			inputs					
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#### VIIT<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

	odule:6	File Handling				3 hours
File	es: Open,	, Read, Write, Append and	l Close. Tell and se	eek metho	ds	
Mo	odule:7	Handling Exceptions				3 hours
Err	ors and l	Exceptions: Syntax Errors	, Exceptions, Han	dling Exc	eptions, Raising Excep	otions,
Ex	ception (	Chaining, User-defined Exe	ceptions, Defining	; Clean-Uj	o actions.	
	odule:8	Contemporary issues:				2 hours
Gu	est lectur	e by Industry experts or R	&D organization			
				Tota	l Lecture hours:	30 hours
Te	xt Book	(s)				
1.	Eric N	Matthes, Python Crash Cou	urse: A Hands-On	, Project-l	Based Introduction to	
	Progra	amming, 2nd Edition, No	starch Press, 2019	•		
Re	ference	Books				
1.	Martic	C Bussen Brethons The Co	1 D C	4.1 1 1.		lichors
-	Warue	C Brown, Python: The Co	omplete Reference	, 4th Editi	on, McGraw Hill Pub	msners,
-	2018.	C brown, Python: The CC	omplete Reference	, 4th Editi	on, McGraw Hill Pub	JIISHE18,
2.	2018.	5 Dierbach, Introduction	-			
	2018. Charles		to Computer Scie	nce using		
2.	2018. Charles Solving	Dierbach, Introduction	to Computer Scie India Edition, 20	nce using 17.	Python: A Computat	
2.	2018. Charles Solving	s Dierbach, Introduction g Focus,2 <sup>nd</sup> Edition, Wiley	to Computer Scie India Edition, 20	nce using 17.	Python: A Computat	
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2. Mo 1. 2. 3. 4.	2018. Charles Solving ode of Events t of Charles Selection List,Tu String I	s Dierbach, Introduction g Focus,2 <sup>nd</sup> Edition, Wiley valuation: CAT / Assign Ilenging Experiments (I tial programs with python onal and Looping construct ples, Dictionary and Sets Manipulation and Regular	to Computer Scie India Edition, 20 India Edition, 20 Indicative) Itokens, operators Itokens, operators Itokens	nce using 17. FAT / Pro	Python: A Computat Dject / Seminar	
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# (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

CSE1007		JAVA PROGRAMMING	L	T	P	J	C 4
Pre-requisi	ite	NIL	3	0 Illab		0	
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Course Ob	jectiv	/es:					
1. To	imp	art the core language features of Java and its Application Programming	Inte	erface	es(A	Pľ	)
	-	onstrate the use of threads, exceptions, files and collection frameworks			,	,	
		liarize students with GUI based application development and database	-				
cont	nectiv	vity.					
Expected (	Cour	se Outcome:					
1. Co	mpre	hend Java Virtual Machine architecture and Java Programming Fundar	nent	als.			
2. De	sign	applications involving Object Oriented Programming concepts such as	inh	eritai	nce,		
asso	ociati	on, aggregation, composition, polymorphism, abstract classes and inter	face	s.			
3. De	esign :	and build multi-threaded Java Applications.					
		ftware using concepts such as files, collection frameworks and contain					
	-	and implement Java Applications for real world problems involving Da	itaba	iseCo	onne	ect	ivity
	0	Graphical User Interface using JavaFX.					
7. De	esign,	Develop and Deploy dynamic web applications using Servlets and Java	a Ser	verP	ages	5.	
Module:1	•	a Fundamentals					ours
		Design goal - Features of Java Language - JVM - Bytecode - Java s					
	ammi	ng constructs- Arrays- one dimensional and multi-dimensional enhan	ced	for le	oop	Str	ring
package							
	T = .						
Module:2		ject Oriented Programming					ours
		tals - Object reference array of objects constructors methods over- loa	-	-			
		ted class inner class garbage collection finalize() Wrapper classes Inhe	rıtan	ce t	ypes	; -	use
1	Polyn	norphism abstract class interfaces packages and sub					
packages.							
Module:3	Do	hustness and Consumance			6	ha	ours
		bustness and Concurrency ling - Exceptions Errors - Types of Exception - Control Flow in Excep	ation		0	по	Jurs
-		catch, finally, throw, throws in Exception Handling - user def	-		cont	ior	10
	-	Thread creation sharing the workload among threads synchroniz			-		
communica	0	· ·	auoi	.1 111	u l	um	.cau
communea							
Module:4	Fil	es, Streams and Object serialization			7	hc	ours
		Java I/O streams Working with files Serialization and deserialization	1 of	obie			
		ons, Collection framework List, Map, Set, Generics Annotations		- ~ j C			
Module:5	GU	I Programming and Database			7	hc	ours
		nnectivity	I		-	-	-
<u> </u>	1						
					67		



# Vellore Institute of Technology

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

GUI programming using JavaFX, exploring events, controls and JavaFX menus Accessing databases using JDBC connectivity.

#### Module:6 Servlets

7 hours

7 hours

2 hours

Introduction to servlet - Servlet life cycle - Developing and Deploying Servlets - Exploring Deployment Descriptor (web.xml) - Handling Request and Response - Session Tracking Management.

#### Java Server Pages Module:7

JSP Tags and Expressions - JSP Expression Language (EL) - Using Custom Tag - JSP with Java Bean.

Module:8	Contemporary Issues

Guest lecture by Industry Experts or R&D organization

#### **Total Lecture hours:**

45 hours

#### Text Book(s)

- Herbert Schildt, The Complete Reference -Java, Tata McGraw-Hill Education, Tenth 1. Edition, 2017.
- Paul J. Deitel, Harvey Deitel, Java SE8 for Programmers (Deitel Developer Series) 3rd 2. Edition, 2014
- Y. Daniel Liang, Introduction to Java programming-comprehensive version-Tenth Edition, 3. Pearson ltd 2015

**Reference Books** 

- Paul Deitel Harvey Deitel, Java, How to Program, Prentice Hall; 9th edition, 2011. 1.
- 2. Cay Horstmann BIG JAVA, 4th edition, John Wiley Sons,2009
- 3. Nicholas S. Williams, Professional Java for Web Applications, Wrox Press, 2014.
- Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

#### List of Challenging Experiments (Indicative)

Write a program to demonstrate the use of multidimensional arrays and looping constructs. 1.

- 2. Write a program to demonstrate the application of String handling functions.
- 3. Write a program to demonstrate the use of Inheritance.
- 4. Write a program to demonstrate the application of user-defined packages and sub-packages.
- 5. Write a program to demonstrate the use of Java Exception handling methods.
- 6. Write a program to demonstrate the use of threads in Java.
- 7. Demonstrate with a program the use of File handling methods in Java.

Demonstrate the use of Java collection frameworks in reducing application development time. 8.

- 9. Build a GUI application using JavaFX
- 10. Write a program to register students data using JDBC with MySQL Database.

11. Write a program that uses Servlets to perform basic banking tasks.

12. Write a web application using JSP and demonstrate the use of http request and response methods.



#### VIIC® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

13.	Write a JSP program for an order r	nanagement system.						
14.								
15.	JSP with Java Bean							
			Total Lal	boratory Hours	30 hours			
			I Utal La	Joratory mours	JU 110015			
Mode	e of Assessment: Assessments/ M			2	50 110018			
	e of Assessment: Assessments/ M mmended by Board of Studies			2	50 110015			



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	ode	Course Title		Т	Р	J	C
CBS300	)5	<b>Cloud Microservices and Applications</b>	3	0	2	0	4
Pre-requisite		NIL		Syl			rsion
					v. 1.	0	
Course Obje							
		amentals of cloud computing					
1 (		rking knowledge of the essentials of Cloud Micro Services					
3. To impleme	ent busin	ess specific cloud applications					
Expected Co	urse Ou	tcome:					
1. Study the ba	asics of c	loud computing, cloud models and its applications.					
2. Understand	cloud se	rvices and architecture.					
3. Learn how	to use Cl	oud Services and to build applications.					
4. Realize secu	irity need	ls for cloud service and Analyze different SLAs					
5. Analyze pla	tform-sp	ecific security features and management of security controls.					
6. Design, De	velop & I	Deploy real-world applications in the cloud computing platfor	rms				
				r			_
Module:1		l Fundamentals				4 H	lours
Cloud Service	Compor	nents - Deployment Models – Application of Cloud Computin	ng				
Madalan)	A	antion Analite stance		Ι		(1)	[
Module:2		cation Architectures	oud	Noti			
Monolithic an	d Distrib	outed – Micro Service fundamentals – Design Approach – Cle	oud	Nati	ve Aj		
Monolithic an	d Distrib		oud	Nati	ve Aj		
Monolithic an	d Distrib Integrati	outed – Micro Service fundamentals – Design Approach – Cle	oud	Nati	ve A <sub>l</sub>	pplic	ation
Monolithic an – Application Module:3	d Distrib Integrati	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management				pplic 8 H	ation
Monolithic an – Application Module:3	d Distrib Integrati	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services				pplic 8 H	ation
Monolithic an – Application Module:3	d Distrib Integrati Cloud ervices - I	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services				pplic <b>8 H</b> vs Az	ation lours
Monolithic an – Application <b>Module:3</b> Application Se	d Distrib Integrati Clouc ervices - I	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi				pplic <b>8 H</b> vs Az	lours
Monolithic an – Application <b>Module:3</b> Application Se <b>Module:4</b> Python-Refre	d Distrib Integrati Clouc ervices - I Clouc sher, Use	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases				8 H 75 Az 8 H	lours zure
Monolithic an – Application <b>Module:3</b> Application Se <b>Module:4</b> Python-Refre <b>Module:5</b>	d Distrib Integrati Cloud ervices - I Cloud sher, Uso	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases				8 H 75 Az 8 H	lours zure
Monolithic an – Application <b>Module:3</b> Application Se <b>Module:4</b> Python-Refre <b>Module:5</b>	d Distrib Integrati Cloud ervices - I Cloud sher, Uso	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases				8 H 75 Az 8 H	ation lours
Monolithic an – Application <b>Module:3</b> Application Se <b>Module:4</b> Python-Refre <b>Module:5</b> Security Basic	d Distrib Integrati Cloud ervices - I Cloud sher, Use Cloud s and Be	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases I Security nefits – Challenges				8 H s Az 8 H	lours lours lours lours
Monolithic an – Application <b>Module:3</b> Application Se <b>Module:4</b> Python-Refre <b>Module:5</b> Security Basic <b>Module:6</b>	d Distrib Integrati Cloud ervices - Cloud sher, Usa Cloud es and Be	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases I Security nefits – Challenges I Service Monitoring and Management				8 H s Az 8 H	lours zure
Monolithic an – Application <b>Module:3</b> Application Se <b>Module:4</b> Python-Refre <b>Module:5</b> Security Basic	d Distrib Integrati Cloud ervices - Cloud sher, Usa Cloud es and Be	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases I Security nefits – Challenges I Service Monitoring and Management				8 H s Az 8 H	lours lours lours
Monolithic an – Application <b>Module:3</b> Application Se <b>Module:4</b> Python-Refre <b>Module:5</b> Security Basic <b>Module:6</b>	d Distrib Integrati Cloud ervices - Cloud sher, Use Cloud es and Be Cloud ty Monit	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases I Security nefits – Challenges I Service Monitoring and Management				8 H 8 Az 8 H 6 H	lours lours lours
Monolithic an – Application Module:3 Application Se Module:4 Python-Refre Module:5 Security Basic Module:6 Cloud Securi Module:7	d Distrib Integrati Cloud ervices - I Cloud sher, Use Cloud s and Be Cloud ty Monite Case	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases I Security nefits – Challenges I Service Monitoring and Management oring Tools				8 H 8 Az 8 H 6 H	lours
Monolithic an – Application Module:3 Application Se Module:4 Python-Refre Module:5 Security Basic Module:6 Cloud Securi Module:7 Azure features	d Distrib Integrati Cloud ervices - I Cloud sher, Use Cloud s and Be Cloud ty Monitu S use case	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases I Security nefits – Challenges I Service Monitoring and Management oring Tools Studies es - GCP Features Use cases - AWS features use cases				8 H 8 Az 8 H 6 H 5 H	lours lours lours
Monolithic an – Application Module:3 Application Se Module:4 Python-Refre Module:5 Security Basic Module:6 Cloud Securi Module:7 Azure features Module:8	d Distrib Integrati Cloud ervices - 1 Cloud sher, Use Cloud ty Monite Cloud ty Monite Suse case Conte	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management <b>I Services</b> Deployment and Management Services - Amazon Web Servi <b>I Application Development</b> e cases <b>I Security</b> nefits – Challenges <b>I Service Monitoring and Management</b> oring Tools <b>Studies</b> es - GCP Features Use cases - AWS features use cases <b>emporary Issues</b>				8 H 8 Az 8 H 6 H 5 H	lours lours lours
Monolithic an – Application Module:3 Application Se Module:4 Python-Refre Module:5 Security Basic Module:6 Cloud Securi Module:7 Azure features Module:8	d Distrib Integrati Cloud ervices - 1 Cloud sher, Use Cloud ty Monite Cloud ty Monite Suse case Conte	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases I Security nefits – Challenges I Service Monitoring and Management oring Tools Studies es - GCP Features Use cases - AWS features use cases				8 H 8 H 8 H 6 H 5 H 6 H 2 H	lours
Monolithic an – Application Module:3 Application Se Module:4 Python-Refre Module:5 Security Basic Module:6 Cloud Securi Module:7 Azure features Module:8	d Distrib Integrati Cloud ervices - I Cloud sher, Use Cloud s and Be Cloud ty Monitu S use case S use case by Indus	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases I Security nefits – Challenges I Service Monitoring and Management oring Tools Studies es - GCP Features Use cases - AWS features use cases emporary Issues try Experts or R&D organization			ndow	8 H 8 H 8 H 6 H 5 H 6 H 2 H	lours
Monolithic an – Application Module:3 Application Se Module:4 Python-Refre Module:5 Security Basic Module:6 Cloud Securi Module:7 Azure features Module:8 Guest lecture Text Book(s)	d Distrib Integrati Cloud ervices - I Cloud sher, Use Cloud ty Monite Cloud ty Monite Suse case by Indus	outed – Micro Service fundamentals – Design Approach – Cle on Process – API fundamental – API Management I Services Deployment and Management Services - Amazon Web Servi I Application Development e cases I Security nefits – Challenges I Service Monitoring and Management oring Tools Studies es - GCP Features Use cases - AWS features use cases emporary Issues try Experts or R&D organization	urs:	- Win	ndow	8 H 8 A 8 H 6 H 5 H 6 H 6 H 2 H 2 H	lours



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CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

 Ronald Krutz and Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley, 2010.

#### **Reference Books**

- 1. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, McGraw Hill, 2010.
- 2. Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Helper, Cloud Computing For Dummies, Wiley, 2010.

#### Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

#### List of Challenging Experiments (Indicative)

- 1. Develop cloud application using Amazon Cloud, Google Cloud.
- 2. Demonstrate cloud application using Windows Azure.
- 3. Implementation of Amazon cloud services.
- 4. Patient Health Monitoring using AWS/Windows Azure.
- 5. Financial Trading Monitoring System using AWS/Windows Azure.
- 6. Cloud Usecase resource monitoring using AWS/Windows Azure.

	Т	otal Labo	ratory Hours:	30 hours		
Mode of Assessment: Assessments/ Mi	id Term Lab/ FA	T / Projec	t			
Recommended by Board of Studies 29-01-2021						
Approved by Academic Council	No. 61	Date	18-02-2021			



#### VIT® Vellore Institute of Technology

#### CURRICULUM (2022 - 2023)

Course Code	Course Title	L	Τ	Р	J	С
CBS3006	Machine Learning	2	0	2	4	4
Pre-requisite	NIL		Sy	llab	us v	ersio
						v. 1.
Course Objective	es: rehend the concept of supervised and unsupervised learning tech					
, ,	ression, classification and clustering techniques and to implement	-		~~ # +1	la (aa c	
· · · · · · · · · · · · · · · · · · ·				0		
	performance of various machine learning techniques and to selve learning algorithms.	ect	appr	орпа	le le	eature
Expected Course	Quitcome:					
	concepts of various machine learning strategies.					
	ational data and learn ANN learning models.					
-	applications by selecting suitable learning model.					
	rmance of the model by combining results from different approac	ches				
1	classify sequencing patterns using HMM.					
8	tion and relationship between the data objects.					
	ine learning model for unseen data and can solve real world applie	catio	on.			
Module:1 In	ntroduction to Machine Learning				3	hour
Introduction to 1	Machine Learning (ML); Feature engineering; Learning Parad	igm	, Ge	enera	lizati	on c
hypothesis, VC Di	mension, PAC learning, Applications of ML.					
			<u> </u>			
Module:2	ata Handling and ANN				4	hour
Feature selection	Mechanisms, Imbalanced data, Outlier detection- Artificial neu	ural	netv	vorks	s inc	ludin
backpropagation-						
Module:3 N	IL Models and Evaluation				6	hour
0	variable regression; Model evaluation; Least squares regression;	0				
Applications of re	gression, Classification – KNN, Naïve Bayes, SVM, Decision Tr	ee; '	Train	0		
11						made
classifier models;	Cross-validation; Model evaluation (precision, recall, F1-mesur			acy, a	area	unde
classifier models;	Cross-validation; Model evaluation (precision, recall, F1-mesur lecision theory including discriminant functions and decision surfa			acy, a	area	unde
classifier models; curve); Statistical c	lecision theory including discriminant functions and decision surfa			acy, a		
classifier models; curve); Statistical c Module:4 N	lecision theory including discriminant functions and decision surfa- Iodel Assessment and Inference	aces			4	hour
classifier models; curve); Statistical c Module:4 M Model assessmen	lecision theory including discriminant functions and decision surface Iodel Assessment and Inference t and Selection – Ensemble Learning – Boosting, Bagging,	aces			4	hour
classifier models; curve); Statistical c Module:4 M Model assessmen	lecision theory including discriminant functions and decision surfa- Iodel Assessment and Inference	aces			4	hour
classifier models; curve); Statistical c Module:4 N Model assessmen Averaging, Bayesia	lecision theory including discriminant functions and decision surface Iodel Assessment and Inference t and Selection – Ensemble Learning – Boosting, Bagging, in Theory, EM Algorithm	aces			4 erenc	hour e and
classifier models;curve); Statistical cModule:4MModel assessmenAveraging, BayesiaModule:5H	lecision theory including discriminant functions and decision surface Iodel Assessment and Inference t and Selection – Ensemble Learning – Boosting, Bagging, in Theory, EM Algorithm Iidden Markov Models	Me	odel	Infe	4 erence 3	hour e and hour
classifier models;         curve); Statistical c         Module:4       M         Model assessmen         Averaging, Bayesia         Module:5       H         Hidden Markov I	lecision theory including discriminant functions and decision surface Iodel Assessment and Inference t and Selection – Ensemble Learning – Boosting, Bagging, in Theory, EM Algorithm Iidden Markov Models Models (HMM) with forward-backward and Vierbi algorithms;	Me Sec	odel	Infe ce cla	4 erence 3 assifi	hour e and hour
classifier models;         curve); Statistical c         Module:4       M         Model assessmen         Averaging, Bayesia         Module:5       H         Hidden Markov I         using HMM; Cor	lecision theory including discriminant functions and decision surface Iodel Assessment and Inference t and Selection – Ensemble Learning – Boosting, Bagging, in Theory, EM Algorithm Iidden Markov Models	Me Sec	odel	Infe ce cla	4 erence 3 assifi	hour e an hour
classifier models;         curve); Statistical c         Module:4       M         Model assessmen         Averaging, Bayesia         Module:5       H         Hidden Markov I	lecision theory including discriminant functions and decision surface Iodel Assessment and Inference t and Selection – Ensemble Learning – Boosting, Bagging, in Theory, EM Algorithm Iidden Markov Models Models (HMM) with forward-backward and Vierbi algorithms;	Me Sec	odel	Infe ce cla	4 erence 3 assifi	hour e an hour



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#### CURRICULUM (2022 - 2023)

	(Deemed to be only	ersity under section 3 of UGC Act, 1956)				
Minin	ng Associ	ation Rules in Large Databa	uses. Mining Frequ	ient Patter	ns basic concepts	- Efficient and
scalab	ole freque	nt item set mining -methods	, Apriori algorithm	, FP-Grow	th algorithm	
Modu	ule:7	Clustering				5 hours
ΚM	leans, Hi	erarchical Clustering – Sing	gle, complete, Av	verage link	age; Ward's algori	thm; Minimum
spann	ning tree	clustering; BIRCH clustering				
Mod	ule:8	Contemporary Issues				2 hours
Guest	t lecture l	by Industry Experts or R&D	organization			
		<u> </u>	0	Total	Lecture hours:	30 hours
Text	Book(s)					
1.	. Ethem	Alpaydin, Introduction to M	Iachine Learning, I	MIT Press,	Pearson, Third Edi	ition, 2014.
2.	. Friedr	an Jerome, Trevor Hastie,	and Robert Tibsl	nirani. The	Elements of Stat	istical Learning.
		er-Verlag, 2nd Edition, 2013.				C
Refer	rence Bo	8.				
1.		P. Murphy, "Machine Learni	ng: A Probabilistic	Perspectiv	re" MIT Press 201	2
2.		Flach, "Machine Learning: T	0	1		
۷.				ce of Aigo	munns mat make	sense of Data,
1/ 1		idge University Press, 2012.			0	
Mode	e of Eval	uation: CAT / Assignmen	t / Quiz / FAI /	Project /	Seminar	
Lista	ofChalle	nging Experiments (Indic	ativa			
1.		nent Decision Tree learning	auvej			
2.	-	nent Logistic Regression				
3.		nent classification using Mult	ilaver perceptron			
4.		nent classification using SVN	, , ,			
5.	1	nent Adaboost	-			
6.		nent Bagging using Random	Forests			
7.		nent K-means Clustering to I		rns in Data		
8.		nent Hierarchical clustering				
9.	Impler	nent K-mode clustering				
10	Impler	nent Association Rule Mining	g using FP Growth	ı		
11.	Classif	cation based on association	rules			
12.	Impler	nent Gaussian Mixture Mode	el Using the Execta	ition Maxir	nization	
13		ting ML algorithm with balar		ed datasets		
14	Compa	rison of Machine Learning a	lgorithms			
15	Impler	nent k-nearest neighbour alg	orithm			
				Tot	al Laboratory Ho	urs: 30 hours
Mode	e of Asse	ssment: Assessments/ M	id Term Lab/ FA	T / Proje	ct	· · · · · · · · · · · · · · · · · · ·
Reco	mmende	ed by Board of Studies	29-01-2021			
		Academic Council	No. 61	Date	18-02-2021	



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CDC2007		Course Title L	T	Р	J	C
CBS3007		Data Mining and Analytics3	0	2	0	4
Pre-requisite		NIL	Syllab			1
0.011.1				v. 1.0		
Course Objectiv						
		iental processes data warehousing and major issues in data n		1.	1	
-	-	ge on various data mining concepts and techniques that ca	in be a	ipplie	d to	text
mining, web mini	0					
3. To develop the	e knowledg	ge for application of data mining and social impacts of data i	mining	5.		
<b>E</b> (10)	0 /					
Expected Cours						
		n of data mining to the decision-support systems.	1 1	.1		
-		ed for data mining using preprocessing techniques and	i appr	y the	e vari	ous
visualization tech	-					
		erns from large amounts of data using Association Rule Min	-			
		on from the labeled data using various classifiers and Predict	ors			
-		variety of linear methods and models	_			
		perform a self-directed piece of practical work that require	es the	appli	cation	ı of
data mining tech	niques.					
	-			1		
Module:1		luction to Data Mining	<u> </u>	Ļ	<u>3 ho</u>	
0		Related technologies - Machine Learning, DBMS, OLAP,			0	s of
the Data Mining	Process, L	Data Mining Techniques, Knowledge Representation Method	ds, App	olicat	ions	
Module:2	Data	oreprocessing			5 ho	11#0
		formation, Data reduction, Discretization and generating	conce	l at hi		
-		ing System, Experiments with Weka - filters, discretization	conce	pt m		nes,
Instannig weka J	Data Mill	ing system, Experiments with weka - inters, discretization				
Module:3	Data t	nining knowledge representation			4 ho	urs
Module:3 Task relevant day	<b>Data 1</b> a. Backer	nining knowledge representation	vledge	. Visı	<b>4 ho</b> 1alizat	
Task relevant day	a, Backgr	ound knowledge, Representing input data and output know			ializa	tion
Task relevant dat techniques; Attri	a, Backgro bute-orien	nining knowledge representation ound knowledge, Representing input data and output know ited analysis: Attribute generalization, Attribute relevance			ializa	tion
Task relevant day	a, Backgro bute-orien	ound knowledge, Representing input data and output know			ializa	tion
Task relevant da techniques; Attri Statistical measur	a, Backgro bute-orien es	ound knowledge, Representing input data and output know ated analysis: Attribute generalization, Attribute relevance			nparis	son
Task relevant da techniques; Attri Statistical measur <b>Module:4</b>	a, Backgro bute-orien es Data 1	ound knowledge, Representing input data and output know	, Class	s con	nparis <b>4 h</b> o	son
Task relevant dar techniques; Attri Statistical measur <b>Module:4</b> Motivation and t	a, Backgro bute-orien es Data r erminolog	ound knowledge, Representing input data and output know ated analysis: Attribute generalization, Attribute relevance mining algorithms - Association rules y, Example: mining weather data, Basic idea: item sets, gene	erating	s con	nparis <b>4 ho</b> sets	son ours and
Task relevant day techniques; Attri Statistical measur <b>Module:4</b> Motivation and t rules efficiently,	a, Backgro bute-orien es <b>Data r</b> erminolog Efficient a	ound knowledge, Representing input data and output know ated analysis: Attribute generalization, Attribute relevance mining algorithms - Association rules y, Example: mining weather data, Basic idea: item sets, gene and scalable frequent item set mining methods: Apriori alg	erating	s con	nparis <b>4 ho</b> sets	son ours and
Task relevant dat techniques; Attri Statistical measur Module:4 Motivation and t	a, Backgro bute-orien es <b>Data r</b> erminolog Efficient a	ound knowledge, Representing input data and output know ated analysis: Attribute generalization, Attribute relevance mining algorithms - Association rules y, Example: mining weather data, Basic idea: item sets, gene and scalable frequent item set mining methods: Apriori alg	erating	s con	nparis <b>4 ho</b> sets	tion son, ours and
Task relevant day techniques; Attri Statistical measur <b>Module:4</b> Motivation and t rules efficiently,	a, Backgro bute-orien es <b>Data 1</b> erminolog Efficient <i>a</i> ation analy	ound knowledge, Representing input data and output know ated analysis: Attribute generalization, Attribute relevance mining algorithms - Association rules y, Example: mining weather data, Basic idea: item sets, gene and scalable frequent item set mining methods: Apriori alg	erating	s con	nparis <b>4 ho</b> sets	tion son, <b>urs</b> and wth
Task relevant dat techniques; Attri Statistical measur Module:4 Motivation and t rules efficiently, algorithm, Correl Module:5	a, Backgro bute-orien es <b>Data 1</b> erminolog Efficient <i>a</i> ation analy <b>Data 1</b>	ound knowledge, Representing input data and output know ited analysis: Attribute generalization, Attribute relevance mining algorithms - Association rules y, Example: mining weather data, Basic idea: item sets, generation and scalable frequent item set mining methods: Apriori algorithms ysis	erating	; item	4 ho sets -Gro 5 ho	urs anc wth
Task relevant day techniques; Attri Statistical measur <b>Module:4</b> Motivation and t rules efficiently, algorithm, Correl <b>Module:5</b> Basic learning/m	a, Backgro bute-orien es <b>Data r</b> erminolog Efficient <i>a</i> ation analy <b>Data r</b> ining task	nining algorithms - Association rules y, Example: mining weather data, Basic idea: item sets, generalization y scalable frequent item set mining methods: Apriori algorithms	erating gorithm	item, FP	4 ho sets -Gro 5 ho	urs and wth
Task relevant day techniques; Attri Statistical measur <b>Module:4</b> Motivation and t rules efficiently, algorithm, Correl <b>Module:5</b> Basic learning/m	a, Backgro bute-orien es <b>Data 1</b> erminolog Efficient <i>a</i> ation analy <b>Data 1</b> ining task prediction	ound knowledge, Representing input data and output know ited analysis: Attribute generalization, Attribute relevance mining algorithms - Association rules y, Example: mining weather data, Basic idea: item sets, gene and scalable frequent item set mining methods: Apriori algorithms - Classification & Prediction mining algorithms - Classification & Prediction as, inferring rudimentary rules: 1R, algorithm, Decision tra- task, Statistical (Bayesian) classification, Bayesian network	erating gorithm	item, FP	4 ho sets -Gro 5 ho	urs and wth
Task relevant day techniques; Attri Statistical measur Module:4 Motivation and t rules efficiently, algorithm, Correl Module:5 Basic learning/m Prediction: The	a, Backgro bute-orien es <b>Data 1</b> erminolog Efficient <i>a</i> ation analy <b>Data 1</b> ining task prediction	ound knowledge, Representing input data and output know ited analysis: Attribute generalization, Attribute relevance mining algorithms - Association rules y, Example: mining weather data, Basic idea: item sets, gene and scalable frequent item set mining methods: Apriori algorithms - Classification & Prediction mining algorithms - Classification & Prediction as, inferring rudimentary rules: 1R, algorithm, Decision tra- task, Statistical (Bayesian) classification, Bayesian network	erating gorithm	item, FP	4 ho sets -Gro 5 ho	urs and wth





Desc	criptive analytics: Data Modeling, Trend	d Analysis, Simple Linear Regression Analysis	
Fore	ecasting models: Heuristic methods, pro	edictive modeling and pattern discovery, Logis	tic Regression:
Logi	it transform. ML estimation. Tests of 1	hypotheses, Wald test, LR test, score test, t	est for overall
0		ard, backward method, interpretation of paran	
-			
		gression Models, Implementing Predictive Mod	
Gen	neralized Linear model: link functions s	uch as Poisson, binomial, inverse binomial, inv	verse Gaussian,
Gam	nma.		
Mod	dule:7 Time Series Analysis		11 hours
Tim	ne Series Analysis: Auto - Covariance, A	Auto-correlation and their properties. Explorat	ory time series
	-	xponential and moving average smoothing, I	•
-	othing, forecasting based on smoothing	aponenium unu moting uteruge omoormig, i	
	0.00		A 1
	8	ve, Moving Average, Autoregressive Moving	0
		models; Estimation of ARMA models such a	
estim	nation for AR Processes, Maximum like	elihood and least squares estimation for ARI	MA Processes,
Fore	ecasting using ARIMA models		
Pres	scriptive Analytics: Mathematical optim	mization, Networks modeling-Multi-objective	optimization-
	chastic modeling, Decision and Risk analys		1
	8,		
			2 hours
Mod	dule:8 Contemporary Issues		2 nours
	dule:8   Contemporary Issues est lecture by Industry Experts or R&D or	ganization	2 110415
	1 2	ganization Total Lecture hours:	45 hours
Gues	est lecture by Industry Experts or R&D or		
Gues Text	est lecture by Industry Experts or R&D or	Total Lecture hours:	45 hours
Gues	t Book(s)	Total Lecture hours:         A. Hall, Christopher Pal, "Data Mining: Pra	45 hours
Gues Text 1.	est lecture by Industry Experts or R&D or <b>t Book(s)</b> Ian H. Witten, Eibe Frank, and Mark Learning Tools and Techniques" Morga	<b>Total Lecture hours:</b> A. Hall, Christopher Pal, "Data Mining: Pra an Kaufmann Publishers, 4 <sup>th</sup> Edition, 2017	45 hours ctical Machine
Gues Text	est lecture by Industry Experts or R&D or <b>t Book(s)</b> Ian H. Witten, Eibe Frank, and Mark Learning Tools and Techniques" Morga George E. P. Box, Gwilym M. Jenkins	<b>Total Lecture hours:</b> A. Hall, Christopher Pal, "Data Mining: Pra an Kaufmann Publishers, 4 <sup>th</sup> Edition, 2017 , Gregory C. Reinsel, Greta M. Ljung. "Time S	45 hours ctical Machine
Gues <b>Text</b> 1. 2.	t Book(s) Ian H. Witten, Eibe Frank, and Mark Learning Tools and Techniques" Morga George E. P. Box, Gwilym M. Jenkins Forecasting and Control", John Wiley, 5	<b>Total Lecture hours:</b> A. Hall, Christopher Pal, "Data Mining: Pra an Kaufmann Publishers, 4 <sup>th</sup> Edition, 2017 , Gregory C. Reinsel, Greta M. Ljung. "Time S	45 hours ctical Machine
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11.	Implement k-nearest neighbors alg	gorithm			
12.	Build statistical models using any l	inear regression techniqu	le		
13.	Build statistical models using Non	linear regression techniq	ue		
14.	Build statistical models using Logis	stic regression			
15.	Perform forecast analysis using AH	RIMA model			
			Tota	l Laboratory Hours	30 hours
Mod	le of Assessment: Assessments/	Mid Term Lab/ FAT	/ Project		
Reco	ommended by Board of Studies	29-01-2021			
Appr	roved by Academic Council	No. 61	Date	18.02.2021	



#### VIID<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	ode	Course Title L	_	Τ	Р	J	С
CBS300	8	Introduction to Internet of Things 3		0	2	0	4
Pre-requisite		NIL		Syl			rsion
0 01:	.•				v.1.	0	
Course Objec		principles and concepts of Internet-of-Things use cases, applic	ati	0.00	anal	itor	1140
		principles and concepts of internet-of-fillings use cases, applic	au	0115,	arci	ntec	luie
and technol	0	for and to and I-T and an an an and the sheet of a sheet of		-1:-			_
2. To get an o	verview (	of an end to end IoT system encompassing the edge, cloud and	ap	plic	auor	i uer	5.
Expected Cou		nome.					
—		nciples and concepts of Internet-of-Things use cases, application	ong	3			
	-	ncepts of Architecture of IoT.	0110				
		Industrial systems.					
		sing and communication for IoT.					
		ta processing and storage.					
-		plications in various domains using prototype models.					
	с 101 ap	preatons in various domains using prototype models.					
Module:1	Introd	luction to IoT and Use cases				31	ours
		ncepts of IoT, Consumer IoT vs Industrial Internet, Fundame	enta	al bi	uildin		
		ous industry domains.				0	,
		,					
Module:2	Archit	ecture				61	ours
						01	10415
IoT reference	architectu	ures, Industrial Internet Reference Architecture, Edge Compu	ıtir	ng, I	oT (		
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		ares, Industrial Internet Reference Architecture, Edge Compu	itin	ng, I	oT (		
Data Ingestion Module:3	and Data	a Processing Pipelines, Data Stream Processing. rs		ng, I	oT (	Gate	
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Data Ingestion Module:3 Introduction to Module:4	and Data Senso sensors Indus	ares, Industrial Internet Reference Architecture, Edge Compute a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing board trial Systems	ds.			Gate	ways,
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Data Ingestion Module:3 Introduction to Module:4 Introduction to Module:5 Recap of OSI technologies ( Module:6 Industrial netw REST, TCP/	and Data Senso Sensors Industria Industria Netwo 7 layer an ZigBee, B Netwo 7 ork prot	a Processing Pipelines, Data Stream Processing. rs and transducers, integrating sensors to sensor processing board trial Systems al data acquisition systems, industrial control systems and their orking and Communication for IoT rchitecture and mapping to IoT architecture, Introduction to p luetooth, Serial Communication) ork protocols ocols (Modbus, CANbus), Communicating with cloud application	fur pro:		ons. ty no web	Gate 61 61 71 etwo 81 sservi	ways, nours nours nours rking nours ces,
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#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

	Total Lecture hours: 45 hour
Text	tt Book(s)
1.	Samuel Greengard, The Internet of Things, MIT Press Essential Knowledge Series, 2015
Refe	erence Books
1.	Ben Fry, Visualizing Data-Exploring and Explaining Data with the Processing Environment, O'Reill
	Media, 2008.
2.	Andrew K Dennis, Raspberry Pi Computer Architecture Essentials, Packt Publishing, 2016
Mod	de of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar
Lab	Experiments
1.	Setting up the Arduino Development Environment, connecting analog sensors to an Arduino
	Boarding and reading analog sensor data
2.	Digital Input and Output reading using and Arduino board and Arduino Development Environment
3.	Integrate an Arduino Board to a Raspberry Pi computer, send sensor data from Arduino to the R Pi
4.	Setup Python on the R Pi and run sample R Pi programs on the R Pi. Read the data from Arduino
	using Python language
5.	Connect a R Pi Camera module to the Raspberry Pi and using Python programming capture still
	images and video
6.	Set up TCP/IP socket server on a PC. Send a message from the R Pi to the PC using socket
-	communication
7.	Set up a MQTT broker on the PC. Send data from R Pi to PC using MQTT protocol. Receive data
0	from PC to R Pi using MQTT protocol
8.	Connect LED lights to an Arduino. Connect the Arduino to the R Pi. Send Message from PC to R F
	via MQTT protocol. On receipt of the message, toggle the LED lights on the Arduino
9.	Set up an account in a cloud service (such as Google / AWS or Azure). Set up a simple Http server
	using a language of your choice. Push the image captured from the R Pi camera to this web service.
	On receiving the image, store the image in a database or file
10.	Develop a mobile application to view the images captured by the R Pi camera
	Total Laboratory Hours 30 hour
	de of Assessment: Assessments/ Mid Term Lab/ FAT / Project
	commended by Board of Studies 29-01-2021
App	broved by Academic Council No. 61 Date 18-02-2021



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Pre-requisiteNILCourse Objectives:1. To introduce the variou2. To Explore the use of sthe world around us on di3. To Perform social medin social media sites.Expected Course Outco1. Interpret the contributio2. Extract useful information3. Identify the various con4. Analyse social media da5. Discover interesting path6. Provide solutions to the opinion miningModule:1Introduction to Text MiniModule:2Text mining Preprocessing	as tools for Text Mining and carry out Pattern Discover social network analysis to understand the growing con ifferent scales lia analytics to identify important social actors, subgrou	tural l Predic s ods and vith se	redictiv vity an nd netv anguag ctors d mode	d com work p ge text els nt ana ing app	delling plexi prope alysis 5 he plicat 6 he	g. ty ir erties and ours cions
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	straction	-		_		
Module:3 Web Min					5 h	
•	alytics tools, Clickstream analysis, A/B testing, online	e surv	veys; V	Veb se	earch	an
retrieval						
Module:4 Web An	alytics Essentials				6 h	
	on, Web crawling and Indexing, Ranking algorithms, We	lob tra	fic m	odels	0 110	oui
Search engine optimizatio	in, web crawing and moexing, Kanking algorithms, we			Jucis		
Module:5 Social M	Iedia Networks				6 h	ou
Social network and web	data and methods. Graphs and Matrices. Basic me	easure	es for	individ	duals	an
networks. Information vis						
Module:6 Social M	Iedia Analytics				7 h	oui
	k analysis. Random graphs and network evolution. S	Social	conte	xts: A	ffiliat	tion
and identity; Social netwo						
	ent Analysis and Opinion Mining				8 h	
Content Analysis Natur	ral Language Processing; Clustering & Topic Det	•	~	1 -		





Mo	dule:8	Contemporary Issues				2 hour
Gu	est lecture b	y Industry Experts or R&D o	rganization			
				Total	Lecture hours:	45 hours
Te	xt Book(s)					
1.	Bing Liu,	Web Data Mining-Exploring	g Hyperlinks, Con	tents, and	Usage Data, Spr	inger, Second
	Edition, 20	)11.				
2.	Reza Zafa	rani, Mohammad Ali Abba	isi and Huan Liu	, Social N	Iedia Mining-An	Introduction,
	Cambridge	e University Press, 2014.				
Re	ference Boo	oks				
1.	Bing Liu, S	Sentiment Analysis: Mining O <sub>1</sub>	pinions, Sentiments	, and Emot	ions, Cambridge U	University
	Press, Seco	ond Edition, 2020.				
2.	Ronen Fel	dman and James Sanger, The	Text Mining Hand	lbook: Adv	anced Approache	s in Analyzing
	Unstructur	ed Data, Cambridge Universit	ty Press, First Edition	on, 2009.		
Mo	ode of Evalu	ation: CAT / Assignment	/ Quiz / FAT / P	roject / Se	eminar	
Re	commende	d by Board of Studies	29-01-2021			
Ap	proved by A	Academic Council	No. 61	Date	18-02-2021	





Course Code	Course Title	L	Τ	Р	J	С
CBS3010	Mobile Computing	3	0	2	0	4
Pre-requisite	NIL		Syl	labus		ion
				v. 1	1.0	
Course Objectives						
	various wireless & cellular communication networks and v	various	tele	phon	e and	satellit
networks.						
2. To build know protocol.	ledge on various Adhoc and sensor networks routing	protoc	ol ai	nd en	ergy	efficier
3. To build skills in	n working with Cognitive radio networks and recent teleco	ommur	nicati	on net	work	S
4. To design and d	evelopment of various network protocol using simulation	tools.				
Expected Course						
±	ompleting the course, the student should be able to					
-	e working principles of mobile networks and (	Control	st d	fform	at tr	<b>1</b> 00
telecommunicat		Jonua	st u	merci	n ty	pes e
	on, handoff management and wireless fundamentals.					
•	NET and Sensor networks including architecture, rou	ting a	ad a	011104	optin	nizatio
	The and sensor networks including architecture, fou	ung a	na p	owei	opui	mzauo
technique.	the nationality and its applications					
	ive ratio networks and its applications.					
	at telecommunication networks, resource management	,	1			
6. Design & develo	opment of various wireless network protocols using simul	ation to	SOIS			
Module:1 Intro	oduction					7 hou
	ess and mobile infrastructure; Preliminary concepts or	ı cellul	ar ai	chited		
	ormance issues; Radio resource management and interfa					
	terference and frequency reuse; Cell splitting; Channel as				-	
of generations:- 1G		0		0		
0						
Module:2 Loca	ation and handoff management					8 hour
Introduction to loo	cation management (HLR and VLR); Mobility models	charact	erizi	ng inc	lividu	al nod
movement (Rando	m walk, Fluid flow, Markovian, Activity based); Mobi	lity mo	odels	chara	cteriz	ing th
movement of grou	ps of nodes (Reference point-based group mobility mo	odel, C	omm	unity	base	d grou
mobility model); St	atic (Always vs. Never update, Reporting Cells, Location	Areas	) and	l Dyna	amic	locatio
management schem	nes (Time, Movement, Distance, Profile Based); Terminal	l Pagin	g (Si	nultar	neous	paging
Sequential paging);	Location management and Mobile IP; Overview of hand	doff pr	oces	s; Fac	tors a	ffectin
handoffs and perfo	rmance evaluation metrics; Handoff strategies; Different	types	of ha	andof	fs (so	ft, harc
horizontal, vertical)						
I						
	eless transmission fundamentals	_		_		7 hou
Introduction to na	rrow and wideband systems; Spread spectrum; Freque	•		0	rodu	ction t
Introduction to na MIMO; MIMO Cl		FDM;	MIM	0-01	rodu FDM	ction t systen



#### CURRICULUM (2022 - 2023)

Module	:4	Mobile Ad-hoc networks				4 hours
Characte	eristic	s and applications; Coverage	and connectivity	problems; H	Routing in MAN	ETs.
			, , , , , , , , , , , , , , , , , , ,		0	
Module	:5	Wireless sensor networks	3			5 hours
Concept	ts, ba	sic architecture, design ob	jectives and app	lications; S	ensing and con	nmunication range;
Coverag	e and	d connectivity; Sensor plac	cement; Data rel	aying and	aggregation; En	ergy consumption;
Clusterin	ng of	sensors; Energy efficient Roy	uting (LEACH).			
						-
Module		Cognitive radio networks				5 hours
		dynamic spectrum access;		1	0	Spectrum sharing;
Interope	erabili	ty and co-existence issues; A	pplications of cog	nitive radio	networks.	
						1
Module		D2D communications in				7 hours
		to D2D communications; H	0 1			
	source	e management, power contro	ol and mode selec	tion proble	ms; Millimeter w	ave communication
in 5G.						
Module		Contemporary Issues				2 hours
Guest le	cture	by Industry Experts or R&I	O organization	I	<b>T</b> 1	
				Total	Lecture hours:	45 hours
Text Bo	\ /					
5		Schiller, Mobile Communica				
2. At	ndrea	Goldsmith, Wireless Comm	unications. Camb	ridge Unive	rsity Press, 2012.	
Referen	ce Bo	ooks				
1. Iv:	an Sto	ojmenovic, Handbook of Wi	reless Networking	and Mobil	e Computing, W	iley, 2002.
2. Ez	zio Bi	glieri, Andrea J. Goldsmith,	Larry J. Greenst	ein, Narava	n Mandayam an	d H. Vincent Poor,
		les of Cognitive Radio. Camb	, ,		•	,
	1	luation: CAT / Assignment	0 ,			
Mode o				/ Hojeet	/ Seminar	
T	01 11					
		enging Experiments (Indi		1 '	. 1 . 1.	1 NIC 2 /
OMNE		evelopment of different wire	eless network prof	ocols using	network simulat	fors such as $NS-3$ /
		rotocol				
		g Protocol				
		ort Protocol				
		tion Control Protocol				
	0	tion Protocol				
		Protocol				
	carrey	11010001		Tota	l hours	30 Hours
Modela	f Asc	essment: Assessments/ N	lid Torm I ah / I			50 110415
		led by Board of Studies	29-01-2021	AI / FIO		
		Academic Council	No. 61	Date	18-02-2021	
Thhrow	cu by		110.01	Date	10-02-2021	



### VIT® Vellore Institute of Technology

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Course Code	Course Title I		Т	Р	J	С
CBS3013	Conversational Systems 3	5	0	2	0	4
Pre-requisite	NIL		Syll	labu	s vei	rsio
				v.1.0	)	
Course Objectives:						
	to acquire knowledge on chatbots and its terminologies					
	ne learning concepts and different algorithms to build custom mod					
3. Understand on co	nversational experiences and provide better customer experiences					
Expected Course C	Dutcome:					
1. Understand the fu	indamentals of conversational systems and foundational blocks of	pro	ograf	nmi	ng.	
2. Apply the natural	language processing techniques in building conversational systems	•				
3. Design and build of	chatbots and conversational intelligent systems.					
4. Analyse the sign	ificance of machine learning methods and artificial intelligence	ce i	in c	conv	ersat	iona
technologies.						
5. Perform the analy	tics on conversational systems using performance metrics.					
Module:1 Fur	ndamentals of Conversational Systems					
					6 h	011#
		- rem	ent	for		
Introduction: Overv	riew, Case studies, Explanation about different modes of engag	-			a hu	ıma
Introduction: Overv being, History and	riew, Case studies, Explanation about different modes of engag impact of AI. Underlying technologies: Natural Language I	Proc	cess	ing,	a hu Arti	ima ificia
Introduction: Overv being, History and Intelligence and M	view, Case studies, Explanation about different modes of engag impact of AI. Underlying technologies: Natural Language I fachine Learning, NLG, Speech-To-Text, Text-To-Speech, Co	Proo omp	cess oute:	ing, r Vi	a hu Arti Ision	uma ificia ete
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Microsoft Bot Framework, Amazon Lex, RASA Channels: Facebook Messenger, Google Home, Alexa, WhatsApp, Custom Apps.Overview of CE Testing techniques, A/B Testing, Introduction to Testing Frameworks - Botium /Mocha, Chai.Security & Compliance – Data Management, Storage, GDPR,



Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

PC	I.Building a	a Voice/Chat Bot, Case Study	
	dule:5	Role of ML/AI in Conversational Technologies	6 hours
		g on how Conversational Systems uses ML technologies in ASR, NLF	0
	0	Language Translation, Emotion/Sentiment Analysis, Information	extraction, etc. to
effe	ectively con	iverse. Case Study.	
Mo	dule:6	Contact Centres	4 hours
Int	roduction t	to Contact centres – Impact & Terminologies, Case studies & Trends,	
Ag	ent/Assista	ant in contact centre	-
Mo	dule:7	Overview on Conversational Analytics	3 hours
Co	nversation	Analytics: The need of it ,Introduction to Conversational Metrics, Sur	nmary, Robots and
		lications overview, XR Technologies in Conversational Systems , XR-	Commerce, Future
tec	nnologies a	ind market innovations overview.	
Mo	dule:8	Contemporary Issues	2 hours
		by Industry Experts or R&D organization	
04		Total Lecture hours:	45 hours
Te	xt Book(s)	I	
1.		McTear, Conversational AI: Dialogue Systems, Conversational Agents and	chatbots, 2020, 1 <sup>st</sup>
	Edition, N	Morgan and Claypool.	
2.	Luis Fern	aando D Haro, Zoraida Callejas, Satosh Nakamura, Conversational Dialog	gue Systems for the
	Next Dec	cade, 2021,1 <sup>st</sup> Edition, Springer.	
Re	ference Bo	ooks	
1.	Srini Jana	rthanam, Chatbots and Conversational UI Development, 2017, 1stEdition	, Packt Publishers.
2.	Diana Per	rez-marin and Ismael Pascual-Nieto, Conversational Agents And Natural I	Language
		on, 2011, 1 <sup>st</sup> Edition, IGI Global publishers.	
Mo	de of Eval	luation:CAT / Assignment / Quiz / FAT / Project / Seminar	
Lis	t of Challe	enging Experiments (Indicative)	
1.		f basics of python programming related to conversational AI	
2.	Impleme	entation of lexical analysis	
3.	Impleme	entation of syntactic analysis	
4.	Impleme	entation of Sentimental Analysis	
5.	Impleme	entation of natural language processing using python libraries.	
6.	Testing	of chatbot frameworks	
7.	Impleme	entation of voice bots	
8.	Impleme	entation of a generic chat bot	
9.	-	entation of a bot for a class room discussion application.	
	Impleme	entation of a bot for a simple medical diagnosis application.	
10.		Total Laboratory hours	00 TT
			30 Hours
Mo		essment: Assessments/ Mid Term Lab/ FAT / Project ed by Board of Studies 22-05-2021	30 Hours

#### VIIC \*\* Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Course Code	Course Title	L	Т	Р	J	C
CBS3014	Modern Web Applications	3	0	2	0	4
Pre-requisite	NIL		Sylla		versio	n
				v.1.0	)	
Course Object		•				
1	nend and analyse the basic concepts of web programming and	internet pro	tocol	s.		
	how the client-server model of Internet programming works.					
3. To demonst	trates the uses of scripting languages and their limitations.					
Expected Co	urse Outcome:					
-	e web protocols and web architecture.					
	IL and CSS effectively to create interactive websites.					
	client-side scripting using JavaScript to design dynamic website	es.				
-	ML based web applications.					
	server-side scripting using PHP.					
-	P application with Database connectivity.					
0						
Module:1	Introduction to Internet & World Wide Web				4 ho	our
History of the	e Internet & World- Wide Web, Web Browsers, Web Server	rs, Uniform	Reso	ource	Loc	itoi
Tools and We	b Programming Languages. Web Standards, Categories of We	eb Applicati	ons,	Char	acteri	stic
	cations, Tiered Architecture					
Module:2	Hypertext Mark Up Language (HTML) and Cascading S	tyle Sheets	(CSS	5)	6 h	our
	Hypertext Mark Up Language (HTML) and Cascading S page, Text Formatting, Table, Headers, Linking, Images, L					
Basic HTML		ist, Meta E	leme	nts, (	Casca	lin
Basic HTML	page, Text Formatting, Table, Headers, Linking, Images, L Inline, Internal and External Style Sheet, Bootstrap	ist, Meta E	leme	nts, (	Casca	ling
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Basic HTML Style Sheets: components d Module:3	page, Text Formatting, Table, Headers, Linking, Images, L Inline, Internal and External Style Sheet, Bootstrap rop down	ist, Meta E - CSS Text	lemer , CS	nts, ( S for	Casca rms, <b>8 ho</b>	ding CSS urs
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Con	nection, Inserting, Viewing, Updating a	nd Deleting Record	ls, Manipu	lating joined tables.	
	dule:8 Contemporary issues				2 hours
Gue	st lecture by industry experts				
<u></u>			Total Le	cture hours:	45 hours
	t Book				
1.	Paul Deitel, Harvey Deitel, Abbey D	eitel, Internet & W	orld Wide	Web - How to Pro	ogram, 2020 6 <sup>u</sup>
	edition, Pearson Education.				
	erence Books				
1.	Fritz Schneider, Thomas Powell, Java Hill.	Script – The Comp	olete Refere	ence, 2017, 3 <sup>rd</sup> Editio	on, McGraw
2.	Steven Holzener, PHP – The Comple	ete Reference,2017,	1 <sup>st</sup> Edition	, Mc-Graw Hill	
Mo	de of Evaluation: CAT / Assignmen	t / Ouiz / FAT /	Project /	Seminar	
List	of Experiments				
1.	Design static web pages required for a			0	
2.	a. Write JavaScript program to validat	e the fields required	d for Book	Store - registration	page.
	b. Create and Validate the Login page	2			
	c. After successful login, update the b	ook details dynami	cally.		
3.	a. Write an XML file which will displa	y the Book inform	ation whicl	h includes the follow	wing:
	Title of the book, Author Name, ISB	N number, Publish	er name, E	dition, Price	
	b. Write a Document Type Definition	n (DTD) to validate	the above	XML file.	
4.	a. Write PHP Program to Convert all	the previous forms	(Book Sto	ore Registration Pag	e and Login
	Page) to PHP forms.				
	b. Define Cart to select books and nu	mber of books, ma	intain Sess	ion for the page.	
	c. Validate the Session data before co	mpleting the Order			
5.	Write a PHP Code to make database	connection and per	form vario	us CRUD operation	ns
		1		otal Laboratory He	
Mod	de of Assessment: Assessments/Mid	term Exam/FAT		ý	<b>I</b>
Rec	commended by Board of Studies	22-05-2021			
App	proved by Academic Council	No. 62	Date	15-07-2021	



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Course Co			L	T	P	J	C
CBS3015	)		3	0	0	0	3
Pre-requisite		NIL	5	/	v.1.0	ersic	)n
Course Object	ives				v.1.0		
		bout IS Auditing procedures					
	_	sition and development of IS controls					
	-	saster Recovery Planning in an organization					
Simplementatio							
Expected Cou	rse Out	come:					
<u> </u>		es involved in auditing process.					
		cies, procedures and standards in Information System managen	nen	t			
		ecovery plan and Business Continuity Plan					
		ice and support activities in ISA					
-		work Infrastructure and assets protection					
		1 -					
Module:1	Proce	ss of Auditing IS	Τ			6 ho	ur
Management of	IS Aud	t Function – Risk Analysis – Internal Controls – Performing as	n IS	S Au	dit –	Con	tro
-		volving IS Audit process					
Module:2	Gover	nance and Management of IT				7 ho	ur
Corporate Gove	ernance	- IS Strategy – IT Investment and allocation processes - Polici	ies :	and I	Proc	edure	es -
Risk Manageme	ent – IS	Management practices –IS Organizational structure and respo	nsił	oilitie	es — ]	Busir	ies
Continuity Plan	ning – A	uditing Business Continuity					
Module:3	IS Op	erations, Maintenance and Support				7 ho	urs
IS Operations-	IS Har	dware -IS Architecture and Software - IS Network Infras	stru	cture	: - 1	Audi	ting
Infrastructure as	nd Oper	ations					
Module:4		uisition, Development and DRP				7 ho	
Auditing Applic	cation C	ontrols – Auditing Systems Development Acquisition and Ma	inte	enano	ce –	Disa	ste
Recovery Plann	ing						
Module:5		ction of Information Assets				8 ho	
Importance of	Informa	tion Security Management - Logical Access - Network Inf	Erast	ruct	ure S	Secur	ity
Auditing Inform	mation	Security Management Framework - Environmental Exposi-	ures	s and	d Co	ontro	ol -
Physical Access	Exposu	res and Controls					
Module:6	System	n Management				4 ho	urs
1	2	Software - Label Checking - Library Protection - Memory F	Prot	ectic	n –	Syste	ems
Maintenance- O	pen Sys	ems – Database Technology - Auditing DBMS Recovery					
X 1 1 7	A 1.					4 1	
Module 7	<b>1</b>	eation Control and Maintenance	<u> </u>	1.		4 ho	
		User Computing Application Risks-Electronic data Interchang					
		Application Software Lifecycle-Application controls-Correct Perfective Maintenance	лле	IVIA	mer	iance	
ruapuve maine	charice-I						





Mo	dule 8	Contemporary Issues				2 hours
Gu	est lecture	by Industry Experts or R&D of	organization			
				Total Le	cture hours:	45 hours
Te	xt Book(s)					
1.	Sandra S	enft, Frederick Gallegos, Ale	eksandra Davis, Ir	nformation	Technology	Control and Audit,
	2013, 4 <sup>th</sup>	edition, Auerbach Publications	5.			
2.	Angel R.	Otero, Information Technolog	gy Control and Au	dit, 2019, 5	<sup>th</sup> edition, CR	C Press.
Re	ference Bo	ooks				
1.	Jack J. C.	hamplain, Auditing Informatio	on Systems, 2003, 2	2 <sup>nd</sup> edition,	Wiley publish	ers.
2.	Ron Web	er, Information System Contr	ol and Audit, 2014	, 4 <sup>th</sup> edition	n, Pearson Pub	olication
Mo	ode of Eva	luation: CAT / Assignment	/ Quiz / FAT /	Project /	Seminar	
Re	commend	ed by Board of Studies	22-05-2021			
Ap	proved by	Academic Council	No. 62	Date	15-07-2021	



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Pre-requisite         NIL         Syllabus version           v.1.0         Course Objectives:         v.1.0           1. To understand the way in which cognitive science is methodologically distinctive while at the same time is an interdisciplinary field where established fields of research—including Psychology, Computer Science, Linguistics, Neuroscience.         2. To develop skills in analyzing, interpreting, and assessing the empirical data and research techniques that contribute to cognitive science.           3. To understand central modeling techniques in cognitive science, including traditional computationa approaches, neural network/deep learning approaches, and dynamical approaches.           Expected Course Outcome:           1. To understand the basic principles and process of cognitive science           2. Learn and understand the learning model and apply the same to appropriate real world applications           3. To demonstrate qualitative and quantitative skill and critical thinking on cognitive science by applying suitable methodology to real world applications           4. Students will understand and apply declarative and logic models           5. Envisage the concept of cognitive science           Module:1         Introduction to Cognitive sciences. Neural Network Models- language: definition Affordance: Categories and concepts; Concept learning: Linguistic knowledge: Syntax, semantics, (and pragmatics) Direc perception, Logic; Machine learning.           Module:2         Concept Hierarchies         7 hours           A brief history of cognitive science.         Procussing discorsphy	Course Code	Course Title	L	Τ	Р	J	С
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contribute to cognitive science.         3. To understand central modeling techniques in cognitive science, including traditional computationa approaches, neural network/deep learning approaches, and dynamical approaches.         Expected Course Outcome:         1. To understand the basic principles and process of cognitive science         2. Learn and understand the learning model and apply the same to appropriate real world applications         3. To demonstrate qualitative and quantitative skill and critical thinking on cognitive science by applying suitable methodology to real world applications         4. Students will understand and apply declarative and logic models         5. Envisage the concept of cognitive learning         6. To demonstrate the acquired inter-disciplinary knowledge in language processing and application or different research approaches with cognitive science         Module:1       Introduction to Cognitive Science       7 hours         Introduction to the study of cognitive sciences. Neural Network Models- language: definition Affordance: Categories and concepts; Concept learning: Linguistic knowledge: Syntax, semantics, (and pragmatics) Direc perception, Logic; Machine learning.         Module:2       Concept Hierarchies       7 hours         A brief history of cognitive science.       Processing of sensory information in the brain, Linguistic knowledge Syntax, semantics, (and pragmatics), Ecological Psychology, constructing memories Methodologica networks, Explicit vs. implicit memory         Module:3       Anatomy of brain       7 hours      <	. 0		1		1,	1 .	.1
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<ul> <li>Learn and understand the learning model and apply the same to appropriate real world applications</li> <li>To demonstrate qualitative and quantitative skill and critical thinking on cognitive science by applying suitable methodology to real world applications</li> <li>Students will understand and apply declarative and logic models</li> <li>Envisage the concept of cognitive learning</li> <li>To demonstrate the acquired inter-disciplinary knowledge in language processing and application of different research approaches with cognitive science</li> <li>Module:1 Introduction to Cognitive Science 7 hours</li> <li>Introduction to the study of cognitive sciences. Neural Network Models- language: definition Affordances</li> <li>Categories and concepts; Concept learning: Linguistic knowledge: Syntax, semantics, (and pragmatics) Direct perception, Logic; Machine learning.</li> <li>Module:2 Concept Hierarchies 7 hours</li> <li>A brief history of cognitive science. Processing of sensory information in the brain, Linguistic knowledge</li> <li>Syntax, semantics, (and pragmatics), Ecological Psychology, constructing memories Methodologica concerns in philosophy, Discretization and generating concept hierarchies, Data Mining System, Generative linguistic, Affordance learning in robotics, Explicit vs. implicit memory</li> <li>Module:3 Anatomy of brain 7 hours</li> <li>Module:4 Memory Models of memory Structure and constituents of the brain fMRI, MEG, Language disorders, Development Information processing (three-boxes) model of memory.</li> <li>Module:4 Memory Models Autoriation processing (three-boxes) model of memory.</li> </ul>							
<ul> <li>To demonstrate qualitative and quantitative skill and critical thinking on cognitive science by applying suitable methodology to real world applications</li> <li>Students will understand and apply declarative and logic models</li> <li>Envisage the concept of cognitive learning</li> <li>To demonstrate the acquired inter-disciplinary knowledge in language processing and application of different research approaches with cognitive science</li> <li>Module:1 Introduction to Cognitive Science 7 hours</li> <li>Introduction to the study of cognitive sciences. Neural Network Models- language: definition Affordances: Categories and concepts; Concept learning: Linguistic knowledge: Syntax, semantics, (and pragmatics) Direct perception, Logic; Machine learning.</li> <li>Module:2 Concept Hierarchies 7 hours</li> <li>A brief history of cognitive science. Processing of sensory information in the brain, Linguistic knowledge Syntax, semantics, (and pragmatics), Ecological Psychology, constructing memories Methodologica concerns in philosophy, Discretization and generating concept hierarchies, Data Mining System, Generative linguistic, Affordance learning in robotics, Explicit vs. implicit memory</li> <li>Module:3 Anatomy of brain</li> <li>Anatomy of brain</li> <li>Thours</li> <li>Artificial intelligence and psychology, Brain Imaging, Brain and language, Affordance learning in robotics further-boxes) model of memory Structure and constituents of the brain fMRI, MEG, Language disorders, Development Information processing (three-boxes) model of memory.</li> <li>Module:4 Memory Models Development Information processing (three-boxes) model of memory.</li> <li>Module:4 Memory Models, Multisensory integration in cortex, Lateralization, Attention and Soft term memory Mathematical models, Multisensory integration in cortex, Lateralization, Attention and Soft term memory Mathematical models, Multisensory integration in cortex, Lateralization, Attention and Soft term memory M</li></ul>			real	world	app	licatio	ons
suitable methodology to real world applications         4. Students will understand and apply declarative and logic models         5. Envisage the concept of cognitive learning         6. To demonstrate the acquired inter-disciplinary knowledge in language processing and application or different research approaches with cognitive science         Module:1       Introduction to Cognitive Science       7 hours         Introduction to the study of cognitive sciences. Neural Network Models- language: definition Affordances       Categories and concepts; Concept learning: Linguistic knowledge: Syntax, semantics, (and pragmatics) Direct         perception, Logic; Machine learning.       7 hours         Module:2       Concept Hierarchies       7 hours         A brief history of cognitive science.       Processing of sensory information in the brain, Linguistic knowledge         Syntax, semantics, (and pragmatics), Ecological Psychology, constructing memories Methodologica       concerns in philosophy, Discretization and generating concept hierarchies, Data Mining System, Generative linguistic, Affordance learning in robotics, Explicit vs. implicit memory         Module:3       Anatomy of brain       7 hours         Artificial intelligence and psychology, Brain Imaging, Brain and language, Affordance learning in robotics, Information processing (three-boxes) model of memory Structure and constituents of the brain fMRI, MEG, Language disorders, Development Information processing (three-boxes) model of memory       6 hours         Brief history of neuroscience, PET, EEG Lateralization Chi							
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<ul> <li>5. Envisage the concept of cognitive learning</li> <li>6. To demonstrate the acquired inter-disciplinary knowledge in language processing and application of different research approaches with cognitive science</li> <li>Module:1 Introduction to Cognitive Science 7 hours</li> <li>Introduction to the study of cognitive sciences. Neural Network Models- language: definition Affordances</li> <li>Categories and concepts; Concept learning: Linguistic knowledge: Syntax, semantics, (and pragmatics) Direct perception, Logic; Machine learning.</li> <li>Module:2 Concept Hierarchies 7 hours</li> <li>A brief history of cognitive science. Processing of sensory information in the brain, Linguistic knowledge</li> <li>Syntax, semantics, (and pragmatics), Ecological Psychology, constructing memories Methodologica concerns in philosophy, Discretization and generating concept hierarchies, Data Mining System, Generative linguistic, Affordance learning in robotics, Explicit vs. implicit memory</li> <li>Module:3 Anatomy of brain 7 hours</li> <li>Artificial intelligence and psychology, Brain Imaging, Brain and language, Affordance learning in robotics Information processing (three-boxes) model of memory.</li> <li>Module:4 Memory Models 6 hours</li> <li>Brief history of neuroscience, PET, EEG Lateralization Child and robotic development Sensory memory</li> <li>Short term memory Mathematical models, Multisensory integration in cortex, Lateralization, Attention and</li> </ul>							
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Short term memory Mathematical models, Multisensory integration in cortex, Lateralization, Attention and		2	elonn	nent	Sense		
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related concepts, long term memory; Rationality	-				.,		



## Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

	ule:5	Sensory Information fusion	5 hours
Matl	nematical m	odels Information fusion, the great past tense debate, Human visu	al attention, Bounded
ratio	nality; Pros <sub>j</sub>	pect theory; Heuristics and biases Looking at brain signals.	
Mod	ule:6	Modelling	6 hours
Fron	n sensation	to cognition, The great past tense debate, Computational mod	els of attention,
Reas	oning in co	omputers, Cybernetics, Cognitivist and emergent stand points, Con	nputational models of
atten	tion, Key p	oints in social cognition,	
Mod	ule:7	Information processing	5 hours
Proc	essing of se	ensory information in the brain. From physics to meaning, Analog vs	. Digital: Code duality.
		ective, Applications of computational models of attentional Context	
Sche	mas; Social	signals	
		-	
Mod	ule:8	Contemporary issues	2 hours
Gues	t lecture by	Industry Experts or R&D organization	÷
		Total Lecture hours	45 hours
	Book		
1.	1	KumarMallick, Samarjeet Borah," Emerging Trends and Appli	ications in Cognitive
		g", 2019, IGI Global Publishers.	
Refe	rence Boo		
1.		Bermudez, "Cognitive Science: An Introduction to the Science	of the Mind", 2020
	Cambridg	e University Press, New York.	
Mod	e of Evalu	ation: CAT / Assignment / Quiz / FAT / Project / Seminar	
<b>.</b>			
		ging Experiments (Indicative)	
1.		and practice: Cognitive Science and its methodology concerns in phil	
2.		ntal approach to studying the working human brain and body. How to	ouse Brain Voyager
3.		or. How to use the BESA dipole simulator.	 .1
3. 4.		ntal approach to processing sensory information in the brain using pytand practice: Written materials needed to get a CogNeuro research st	
4.		ff the ground: Runsheets, SOPs, questionnaires, informed consent for	5
5.		on to EEG recordings. Theory, physiology, practical aspects of record	
		ded brain potentials.	
6.		ysis: How to get from the raw recording to specific brain waves. An e	xample analysis.
7.		temming operation in python using NLTK	
8.		emmatization in python using NLTK	
9.		parts of speech tagging in python using NLTK	
10.	-	nd running Robot programs – Activity of PICK and Place of an object	- - -
11.	-	ulation model using Rockwell ARENA 11.0 to show the functions / p	
		uring work cell.	
12.	Simulation	n modelling of four machine system using Rockwell ARENA 11.0.	
13.	Build an A	Artificial Neural Network by implementing the Backpropagation algori	thm and test the same
	using app	ropriate data sets.	



VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Evaluating ML algorithm with bala	nced and unb	alanced o	latasets Comparison of Mac	chine Lea	urning
algorithms.					
Apply EM algorithm to cluster a se	et of data store	ed in a .C	CSV file. Use the same data,	set for cl	ustering
using k- Means algorithm. Compar	e the results o	f these t	wo algorithms and commen	t on the	quality
of clustering. You can add Java/Py	thon ML libra	ary classe	s/API in the program.		
			Total Laboratory	Hours	30 hours
e of Assessment: Assessment/Mi	dterm Exam	/FAT			
ommended by Board of Studies	22-05-2021				
oved by Academic Council	No. 62	Date	15-07-2021		
)	algorithms. Apply EM algorithm to cluster a secusing k- Means algorithm. Compar of clustering. You can add Java/Py e of Assessment: Assessment/Mi mmended by Board of Studies	algorithms. Apply EM algorithm to cluster a set of data store using k- Means algorithm. Compare the results o of clustering. You can add Java/Python ML libra e of Assessment: Assessment/Midterm Exam mmended by Board of Studies 22-05-2021	algorithms. Apply EM algorithm to cluster a set of data stored in a .C using k- Means algorithm. Compare the results of these to of clustering. You can add Java/Python ML library classe e of Assessment: Assessment/Midterm Exam/FAT mmended by Board of Studies 22-05-2021	algorithms. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data, using k- Means algorithm. Compare the results of these two algorithms and commen of clustering. You can add Java/Python ML library classes/API in the program. Total Laboratory e of Assessment: Assessment/Midterm Exam/FAT mmended by Board of Studies 22-05-2021	Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data, set for clusing k- Means algorithm. Compare the results of these two algorithms and comment on the of clustering. You can add Java/Python ML library classes/API in the program. Total Laboratory Hours e of Assessment: Assessment/Midterm Exam/FAT mmended by Board of Studies 22-05-2021



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	Course title	L	Τ	Р	J	С
CBS4001	<b>Robotics and Embedded Systems</b>	3	0	2	0	4
Pre-requisite	NIL		Sylla	bus	versi	on
				v. 1.	.0	
Course Objectives:						
	incepts of embedded system design, peripherals and its modeli	ng				
-	tance of RTOS and illustrate various real world examples					
3. To introduce basics	of robot, mathematics and its applications					
Expected Course O	itcome:					
<u>.</u>	edge about embedded system design and basics of robot.					
2. Ability to unders	tand the internal architecture and interfacing of different p	berip	hera	l dev	vices	wit
microcontrollers.						
3. Ability to understa	and the modelling of hardware software requirements and their	r trac	de-of	fs.		
4. To learn RTOS ar	id its issues for real time system design					
	is real world case studies					
6. Ability to design	a component or a product applying all the relevant stand	lards	and	wit	h rea	alist
constraints						
	oduction to Embedded System					lou
•	General computing systems, History of Embedded systems,				Embe	dde
systems, Microprocess	sor and Microcontroller, Hardware architecture of the real time	e sys	tems	•		
Module:2 Dev	ices and Communication Buses				6 h	ioui
I/O types, serial and	parallel communication devices, wireless communication devi-	ces,	time	r and	l cou	ntir
devices, watchdog tin	ner, real time clock, serial bus communication protocols, 1	paral	lel c	omn	nunic	atio
	CI, PCT-X, and Internet embedded system network protocols,	, USI	B, Bl	uetoo	oth.	
network using ISA, P						
	mam Modelling				61	011
Module:3 Pro	gram Modelling tal issues in Hardware software co-design Unified Model	ling	Lan	01120		
Module:3 Pro Concepts, Fundamen	tal issues in Hardware software co-design, Unified Model	0		0 0	e (U	ML
Module:3 Prog Concepts, Fundamen Hardware Software tr		0		0 0	e (U	ML
Module:3 Prog Concepts, Fundamen Hardware Software tr	tal issues in Hardware software co-design, Unified Model	0		0 0	e (U	ML
Module:3 Prog Concepts, Fundamen Hardware Software tr system.	tal issues in Hardware software co-design, Unified Model	0		0 0	e (U proc	ML
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Module:3ProgramConcepts, FundamentHardware Software trsystem.Module:4RealOperating system bcommunication, task sModule:5ExalMobile phones, RFI	tal issues in Hardware software co-design, Unified Model ade-offs - DFG model, state machine programming model, m <u>I Time Operating Systems</u> pasics, Tasks, Process and Threads, Multiprocessing a synchronization, qualities of good RTOS. mples of Embedded System	nd	for n mult	itask	e (U proc 7 h ing, 7 h	esso ioui tas
Module:3ProgramConcepts, FundamentHardware Software trsystem.Module:4ReaOperating system bcommunication, task sModule:5ExaMobile phones, RFIPopular microcontrol	tal issues in Hardware software co-design, Unified Model ade-offs - DFG model, state machine programming model, m I Time Operating Systems basics, Tasks, Process and Threads, Multiprocessing a synchronization, qualities of good RTOS. mples of Embedded System D, WISENET, Robotics, Biomedical Applications, Brain	nd	for n mult	itask	e (U proc 7 h ing, 7 h rface	MI. esso ioui tas



#### VIIC® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Module:7	Kinematics and Algorith	ims			7 hours
Kinematics of	serial robots, Kinematics of	parallel robots, I	Motion plannir	ng and control,	Sensing distance
	Line Following Algorithms, F	1	-	0	0
Module:8	Contemporary issues				2 hours
Guest lecture	by Industry Experts or R&D	organization			
			Total Lecture	e hours:	45 hours
Text Book(s					
1. Shibu K	. V , "Introduction to Embed	ded Systems", 2 <sup>n</sup>	<sup>d</sup> Edition, McC	Graw Hill, 2017	
2. Ashitav	Ghosal, "Robotics: Fundame	ental Concepts ar	nd Analysis", C	Oxford Universi	ty Press, 2006.
Reference B	oks				
1. L. B. I	as, "Embedded Systems: Ar	Integrated App	proach",1st edi	ition, Pearson	Education India
2012.					
2. Raj Kai	nal, "Embedded Systems- Ar	rchitecture, Prog	ramming and	Design", 3rd H	Edition, McGrav
Hill Ed	ication, 2017.				
Mode of Eva	luation: CAT / Digital Assi	gnment / Quiz	/ FAT / Lab		
	enging Experiments (Indica	itive)			
	c Operations using 8051				
	g ADC and DAC				
	g LED and PWM				
	g real time clock and serial po	<i>i</i> rt			
	g keyboard and LCD				
6. Flashing					
	g stepper motor and temperat				
	obotic arm and its configuration	ions			
D. Study of	obotic end effectors				
Mada CA			otal Laborato	ory Hours	30 hours
	essment: Assessments/ Mi ed by Board of Studies	d Term Lab/ F. 29-01-2021	AT / Project		
	Academic Council	No. 61	Date	18-02-2021	
rippioved by		110.01	Date	10-02-2021	



Course Code		Course Title L	T	Р	J	С
CBS4002		Cryptology and Analysis 3	0	0	0	3
Pre-requisite	NIL		Sylla	bus	versi	ion
				v.1.	0	
Course Objectives						
		ts of cryptography and algorithms				
2. To defend the se	curity attacks	on information systems using secure algorithms and Au	uther	iticat	ion	
process						
		xey concepts of cryptanalysis and quantum cryptograph	у			
Expected Course						
	•	ntroduced strong cryptosystems.				
		orithms for information security.				
-		nemes for membership authorization.				
		secure communication and challenges related to the sec	ure a	pplic	ation	IS
5. Ability to identify	y the need of	quantum cryptographic solutions.				
		to Cryptography				nou
	ryptography	: Elementary number theory, Pseudo-random bit gen	eratic	on, E	leme	enta
cryptosystems.						
Basic security serv	vices: confid	entiality, integrity, availability, non-repudiation, privacy				
Modulov? B	acia Summo	tria Kau Crantaguatama			81	
		tric Key Cryptosystems	th so	mer		
Stream Cipher: Bas	sic Ideas, Ha	rdware and Software Implementations, Examples with	th so	me p		
Stream Cipher: Bas	sic Ideas, Ha		th so	me p		
Stream Cipher: Bas ciphers: A5/1, Grai	sic Ideas, Ha	rdware and Software Implementations, Examples wit 4, Salsa and ChaCha, HC128, SNOW family, ZUC	th so	me p	orom	iner
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Stream Cipher: Bas ciphers: A5/1, Grai Module:3 A Block Ciphers: DES Module:4 P	sic Ideas, Ha in family, RC dvanced Syn S, AES, Mod ublic Key C	rdware and Software Implementations, Examples wit 4, Salsa and ChaCha, HC128, SNOW family, ZUC <b>nmetric Key Cryptosystems</b> es of Operation; Hash Functions; Authentication	th so	me r	5 h	noui
Stream Cipher: Bas ciphers: A5/1, Grai Module:3 A Block Ciphers: DES Module:4 P RSA, ECC; Digital	sic Ideas, Ha in family, RC dvanced Syn S, AES, Mod ublic Key Ca signatures	rdware and Software Implementations, Examples wit 4, Salsa and ChaCha, HC128, SNOW family, ZUC nmetric Key Cryptosystems es of Operation; Hash Functions; Authentication yptosystems	th so	me r	5 h	noui
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Stream Cipher: Basciphers: A5/1, GraiModule:3ABlock Ciphers: DESModule:4PRSA, ECC; DigitalModule:5BElectronic commertModule:6A	sic Ideas, Ha in family, RC dvanced Syn S, AES, Mod ublic Key Ca signatures asic Security ce (anonymo dvanced Sec	rdware and Software Implementations, Examples wit 4, Salsa and ChaCha, HC128, SNOW family, ZUC <b>nmetric Key Cryptosystems</b> es of Operation; Hash Functions; Authentication <b>yptosystems</b> <i>a</i> Applications us cash, micro-payments), Key management, Zero-know curity Applications	wledg	ge pro	5 h 5 h 6 h	noui
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Stream Cipher: Basciphers: A5/1, GraiModule:3ABlock Ciphers: DESModule:4PiRSA, ECC; DigitalModule:5BElectronic commerModule:6ACryptology in Cont	sic Ideas, Ha in family, RC dvanced Syn S, AES, Mod ublic Key Ca signatures casic Security ce (anonymo dvanced Sec tact Tracing A	rdware and Software Implementations, Examples wit 4, Salsa and ChaCha, HC128, SNOW family, ZUC nmetric Key Cryptosystems es of Operation; Hash Functions; Authentication yptosystems v Applications us cash, micro-payments), Key management, Zero-know curity Applications applications, Issues related to Quantum Cryptanalysis E	wledg	ge pro	5 h 5 h 6 h otoco 5 h	nour
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Stream Cipher: Basciphers: A5/1, GraiModule:3ABlock Ciphers: DESModule:4PiRSA, ECC; DigitalModule:5BElectronic commerModule:6ACryptology in ContModule:7Post-Quantum Cryptology	sic Ideas, Ha in family, RC dvanced Syn S, AES, Mod ublic Key Ca signatures asic Security ce (anonymo dvanced Sec tact Tracing A ost-Quantur ptography, F	rdware and Software Implementations, Examples wit 4, Salsa and ChaCha, HC128, SNOW family, ZUC <b>nmetric Key Cryptosystems</b> es of Operation; Hash Functions; Authentication <b>yptosystems</b> <b>a Applications</b> us cash, micro-payments), Key management, Zero-know <b>curity Applications</b> Applications, Issues related to Quantum Cryptanalysis E <b>n Cryptography</b> ublic-Key Post-Quantum Cryptographic Algorithms, St	wledg	e pro	5 h 5 h 6 h 5 h 5 h	noun
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Stream Cipher: Basciphers: A5/1, GraiModule:3ABlock Ciphers: DESModule:4PRSA, ECC; DigitalModule:5BElectronic commerModule:6ACryptology in ContModule:7PPost-Quantum CrypSignatures, ThreshopModule:8Q	sic Ideas, Ha in family, RC dvanced Syn S, AES, Mod ublic Key Cr signatures asic Security ce (anonymo dvanced Sec tact Tracing A ost-Quantur ptography, F old Cryptogra Contempora	rdware and Software Implementations, Examples wit 4, Salsa and ChaCha, HC128, SNOW family, ZUC mmetric Key Cryptosystems es of Operation; Hash Functions; Authentication yptosystems as cash, micro-payments), Key management, Zero-know surity Applications applications, Issues related to Quantum Cryptanalysis E n Cryptography ublic-Key Post-Quantum Cryptographic Algorithms, St phy	wledg	e pro	5 h 5 h 6 h 5 h 5 h 8 h 8 h	noun
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#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Te	ext Book(s)							
1.	W. Stallings, Cryptography and Network Sec	urity: Principle	es and Prac	tice, 7th Edition, Pearson, 2017.				
2.	A. J. Menezes, P. C. van Oorschot, and S. A. Vanstone, Handbook of Applied Cryptography., CRC							
	Press, 2011							
Re	eference Books							
1.	C. S. Mukherjee, D. Roy, S. Maitra, Design	n & Cryptanal	ysis of ZU	JC - A Stream Cipher in Mobile				
	Telephony. Springer, 2020							
2.	D. R. Stinson, Cryptography, Theory and Pra	actice. CRC Pr	ess, 2014.					
Mode of Evaluation: CAT / Assignment / Quiz / FAT								
Re	ecommended by Board of Studies 29-	01-2021						
Ap	pproved by Academic Council No	. 61	Date	18-02-2021				



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	Course Title	L	T	Р	J	С
CBS4003	Quantum Computation & Quantum Information	3	0	2	0	4
Pre-requisite	NIL	Sy			ersi	on
<u> </u>			1	v. 1.(	0	
Course Objectives						
	e fundamental concepts on quantum computing					
	lo computation using quantum algorithms					
3. To process secure	e information in various modern-day applications					
Expected Course	Autcome					
<u>^</u>	asic concepts on quantum computing					
	nt quantum algorithms for performing computations on quantum	m com	nute	ers		
-	y unpredictable random numbers to ensure the strongest level of		-			
-	mmunication using quantum key distribution method	f enery	put	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
	idardize quantum-resistant public-key cryptographic algorithms					
	a computations to solve simple problems					
or remornin quantum						
Module:1 In	troduction to Quantum Information				6 h	ours
	Measurements, Quantum Entanglement: Quantum Teleportation	on, Su	oer-	dens		
-	ntum gates and circuits.	· 1	-			U
<b>_</b>	0					
Module:2 Q	uantum Algorithms Basic				0.1	
•	0					ours
`	on, Grover, Shor, Implication of Grover's and Simon's algo	rithms	tow	vards		
`	on, Grover, Shor, Implication of Grover's and Simon's algo	rithms	tow	vards		
Deutsch-Jozsa, Sim symmetric key crypt	ion, Grover, Shor, Implication of Grover's and Simon's algo tosystems	rithms	tow	vards	s cla	ssica
Deutsch-Jozsa, Sim symmetric key crypt Module:3 Q	on, Grover, Shor, Implication of Grover's and Simon's algo tosystems Quantum Algorithms Advanced				s cla 8 h	ssica
Deutsch-Jozsa, Sim symmetric key crypt Module:3 Q Implication of Shore	ion, Grover, Shor, Implication of Grover's and Simon's algo tosystems				s cla 8 h	ssica
Deutsch-Jozsa, Sim symmetric key crypt Module:3 Q	on, Grover, Shor, Implication of Grover's and Simon's algo tosystems Quantum Algorithms Advanced				s cla 8 h	ssica
Deutsch-Jozsa, Sim symmetric key crypt Module:3 Q Implication of Shor cryptosystems	ion, Grover, Shor, Implication of Grover's and Simon's algo tosystems Quantum Algorithms Advanced r's algorithm towards factorization and Discrete Logarithm ba				s cla <b>8 h</b> public	ssica ours c key
Deutsch-Jozsa, Sim symmetric key crypt Module:3 Q Implication of Shor cryptosystems Module:4 Q	on, Grover, Shor, Implication of Grover's and Simon's algo tosystems Quantum Algorithms Advanced	ased cl:	assic	cal p	s cla 8 h public 7 h	ssica ours c key ours
Deutsch-Jozsa, Sim         symmetric key crypt         Module:3       Q         Implication of Short         cryptosystems         Module:4       Q         Quantum True Rate	uon, Grover, Shor, Implication of Grover's and Simon's algo tosystems uantum Algorithms Advanced r's algorithm towards factorization and Discrete Logarithm ba uantum True Random Number Generators (QTRNG): ndom Number Generators (QTRNG): Detailed design and	ased cl:	assic	cal p	s cla 8 h public 7 h	ssica ours c key ours
Deutsch-Jozsa, Sim symmetric key crypt Module:3 Q Implication of Shor cryptosystems Module:4 Q	uon, Grover, Shor, Implication of Grover's and Simon's algo tosystems uantum Algorithms Advanced r's algorithm towards factorization and Discrete Logarithm ba uantum True Random Number Generators (QTRNG): ndom Number Generators (QTRNG): Detailed design and	ased cl:	assic	cal p	s cla 8 h public 7 h	ssica ours c key ours
Deutsch-Jozsa, Sim symmetric key crypt Module:3 Q Implication of Shor cryptosystems Module:4 Q Quantum True Ran Commercial produc	uon, Grover, Shor, Implication of Grover's and Simon's algo tosystems yuantum Algorithms Advanced r's algorithm towards factorization and Discrete Logarithm ba uantum True Random Number Generators (QTRNG): ndom Number Generators (QTRNG): Detailed design and	ased cl:	assic	cal p	s cla 8 h oublio 7 h	ssica ours c key ours ness
Deutsch-Jozsa, Sim         symmetric key crypt         Module:3       Q         Implication of Shor         cryptosystems         Module:4       Q         Quantum True Rat         Commercial product         Module:5       Bat	tosystems <b>Puantum Algorithms Advanced</b> r's algorithm towards factorization and Discrete Logarithm back <b>uantum True Random Number Generators (QTRNG):</b> ndom Number Generators (QTRNG): Detailed design and ets and applications	ased cl:	assic	cal p	s cla 8 h oublio 7 h	ssica ours c key ours ness
Deutsch-Jozsa, Sim         symmetric key crypt         Module:3       Q         Implication of Short         cryptosystems         Module:4       Q         Quantum True Rat         Commercial product         Module:5       Ba         Quantum key distril	non, Grover, Shor, Implication of Grover's and Simon's algo tosystems <b>Quantum Algorithms Advanced</b> r's algorithm towards factorization and Discrete Logarithm back <b>uantum True Random Number Generators (QTRNG):</b> Indom Number Generators (QTRNG): Detailed design and tes and applications <b>asic Quantum key distribution</b> bution (QKD): BB84, Ekert, Semi-Quantum QKD protocols	ased cl:	assic	cal p	s cla 8 h public 7 h ntum 4 h	ssica ours c key ness
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Deutsch-Jozsa, Sim         symmetric key crypt         Module:3       Q         Implication of Shore         cryptosystems         Module:4       Q         Quantum True Rate         Commercial product         Module:5       Bat         Quantum key distril         Module:6       Ad         Variations in Semi-C         Module:7       In	ion, Grover, Shor, Implication of Grover's and Simon's algo tosystems Quantum Algorithms Advanced r's algorithm towards factorization and Discrete Logarithm ba uantum True Random Number Generators (QTRNG): ndom Number Generators (QTRNG): Detailed design and ets and applications asic Quantum key distribution bution (QKD): BB84, Ekert, Semi-Quantum QKD protocols dvanced Quantum key distribution Quantum QKD protocols, Issues of Device Independence, Con	ased cla issues	assid of	quan	s cla 8 h public 7 h ntum 4 h cts 6 h	ssica ours c key nours ness nours
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Deutsch-Jozsa, Sim         symmetric key crypt         Module:3       Q         Implication of Shore         cryptosystems         Module:4       Q         Quantum True Rate         Commercial product         Module:5       Ba         Quantum key distril         Module:6       Ad         Variations in Semi-C         Module:7       In         Refer to https://cs         this list.         Module:8       Commercial	ion, Grover, Shor, Implication of Grover's and Simon's algo tosystems wantum Algorithms Advanced r's algorithm towards factorization and Discrete Logarithm ba uantum True Random Number Generators (QTRNG): ndom Number Generators (QTRNG): Detailed design and ets and applications asic Quantum key distribution bution (QKD): BB84, Ekert, Semi-Quantum QKD protocols dvanced Quantum key distribution Quantum QKD protocols, Issues of Device Independence, Con htroductory topics in Post-Quantum Cryptography src.nist.gov/projects/post-quantum-cryptography. May discuss	ased cla issues	assid of al pr	quan	s cla 8 h public 7 h ntum 4 h cts 6 h ners 2 h	ssica ours c key nours ness nours nours from



# Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Tex	xt Book(s)
1.	M. A. Nielsen and I. L. Chuang, Quantum Computation and Quantum Information, Cambridge
	University Press. 2010.
2.	Chris Bernhardt, Quantum Computing for Everyone, MIT Press 2019.
Ref	ference Books
1.	Presskil Lecture notes: Available online: http://www.theory.caltech.edu/~preskill/ph229/
2.	NIST Post Quantum Cryptography, Available online: https://csrc.nist.gov/projects/post-quantum-
	cryptography/
Mo	de of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar
Lis	t of Challenging Experiments (Indicative)
1.	Introduction of quantum Instruction Set Architecture for quantum computations
2.	Use of quantum instruction language such as Quil, etc. for performing any quantum computations
3.	Programs using bits and qubits
4.	Implementation of quantum algorithms - Deutsch–Jozsa problem, Simon's algorithm and Shor's algorithm
5.	Implement classical logics using quantum circuits
6.	Program to implement Quantum counting
7.	Program for Quantum optimization algorithms
8.	Program for quantum walk to solve problems include search and sampling without errors
9.	Implementation of Quantum algorithm for solving linear systems of equations
	Total Laboratory Hours 30 hours
Mo	de of Assessment: Assessments/ Mid Term Lab/ FAT / Project
Rec	commended by Board of Studies 29-01-2021
Ap	proved by Academic Council No. 61 Date 18-02-2021



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	Course Title	L	Т	Р	J	С
CBS4004	Image Processing and Pattern Recognition	3	0	0	4	4
Pre-requisite	NIL	S	yllab		rsion	
			۲	7. 1.0		
Course Objectives:						
	amental concepts of image processing and pattern recognit					
	ous image processing steps and their applications in real tin					
	nts to incorporate pattern recognition in image processing	g and it	s imp	ortan	ce in	real
time applications.						
E (10 0						
Expected Course Ou	concepts of image processing with mathematical interpreta	tion				
	ge of different image enhancement, and image registration		•	6 - 1- 1	4 -	
	rious image segmentation and morphological operations for ts of color image processing.	or parti	tion c	or obje	ects	
		and				
scene from image feat	amental concepts of various feature extraction technique	s and i	lecogi	nze t	ne m	lage
0		plicatio		ah aa	indu	+
medicine and defense.	nent image processing techniques for various real-time ap	pucauc	ms su	ch as	mau	stry,
medicine and defense.						
Module:1 Digit	al Image Fundamentals				8 ha	11170
	rocessing systems and its applications. Basic image file for	nats			0 110	<b>u</b> 15
	eometric and photometric models; Digitization - sam		quanti	izatio	n; In	nade
-		0,	1		)	
uemmuon and its repre	esentation, neighbourhood metrics.					iage
demnuon and its repre	esentation, neighbourhood metrics.					
	esentation, neighbourhood metrics. The Enhancement				6 ha	_
Module:2 Imag		ncemen	.t; Sm	oothi		ours
Module:2 Imag Enhancement, contras	e Enhancement					ours
Module:2 Imag Enhancement, contras and order statistic filte	<b>ge Enhancement</b> st stretching, histogram specification, local contrast enhar ring, sharpening, spatial convolution, Gaussian smoothing				ng, lii	ours
Module:2ImagEnhancement, contrasand order statistic filteModule:3Imag	<b>The Enhancement</b> st stretching, histogram specification, local contrast enhar ring, sharpening, spatial convolution, Gaussian smoothing <b>re registration</b>	, DoG,	, LoG		ng, lii 6 ho	ours
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-	<b>The Enhancement</b> st stretching, histogram specification, local contrast enhan ring, sharpening, spatial convolution, Gaussian smoothing <b>the registration</b> -modal/multimodal image registration; Global/local registration;	, DoG,	, LoG		ng, lii 6 ho	ours
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-	<b>The Enhancement</b> st stretching, histogram specification, local contrast enhar ring, sharpening, spatial convolution, Gaussian smoothing <b>re registration</b>	, DoG,	, LoG		ng, lii 6 ho	ours near
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures for	<b>The Enhancement</b> st stretching, histogram specification, local contrast enhan ring, sharpening, spatial convolution, Gaussian smoothing <b>the registration</b> -modal/multimodal image registration; Global/local registration; Intensity/pixel interpolation.	, DoG,	, LoG		ng, lin 6 ho form	ours near ours and
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4Morp	<b>The Enhancement</b> st stretching, histogram specification, local contrast enhan- ring, sharpening, spatial convolution, Gaussian smoothing <b>The registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation.	, DoG,	, LoG	'ransf	ng, lin 6 hc form 5 hc	ours ours ours
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4MorpMorphologicalFilte	<b>ge Enhancement</b> st stretching, histogram specification, local contrast enhan ring, sharpening, spatial convolution, Gaussian smoothing <b>ge registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation. 	, DoG, gistration	, LoG	'ransf ing c	6 hc orm 5 hc	ours ours ours
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4MorpMorphologicalFilte	<b>The Enhancement</b> st stretching, histogram specification, local contrast enhan- ring, sharpening, spatial convolution, Gaussian smoothing <b>The registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation.	, DoG, gistration	, LoG	'ransf ing c	6 hc orm 5 hc	ours near ours and
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4MorpMorphological FilteRegion filling, Objects	<b>ge Enhancement</b> st stretching, histogram specification, local contrast enhan- ring, sharpening, spatial convolution, Gaussian smoothing <b>ge registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation. 	, DoG, gistration	, LoG	'ransf ing c	<b>6 hc</b> form <b>5 hc</b> operaters	ours near ours and ours ors,
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4MorpMorphological FilteRegion filling, ObjectsModule:5Imag	<b>The Enhancement</b> st stretching, histogram specification, local contrast enhan- ring, sharpening, spatial convolution, Gaussian smoothing <b>registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation. - <b>bhological processing</b> ering Basics: Dilation and Erosion Operators, Openin Skeletons-Thinning and Thickening boundaries, Convex registration	, DoG, gistration ng and Hull, T	, LoG on; T Clos op Ha	'ransf ing c at Filt	<b>6 hc</b> orm <b>5 hc</b> operat ers <b>7 hc</b>	ours near ours and ours ors,
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4MorpMorphologicalFilteRegion filling, ObjectsModule:5ImagSegmentation:Pixel	<b>ge Enhancement</b> st stretching, histogram specification, local contrast enhan- ring, sharpening, spatial convolution, Gaussian smoothing <b>ge registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation. 	, DoG, gistration ng and Hull, T	, LoG on; T Clos op Ha	ing c at Filt	<b>6 hc</b> orm <b>5 hc</b> operat ers <b>7 hc</b> Optin	ours near ours and ours ors,
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4MorpMorphologicalFilteRegion filling, ○bjectsModule:5ImagSegmentation:Pixelthresholding-Baye	<b>The Enhancement</b> st stretching, histogram specification, local contrast enhan- ring, sharpening, spatial convolution, Gaussian smoothing <b>The registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation. <b>Chological processing</b> <b>Steletons-Thinning and Erosion Operators, Opening</b> Skeletons-Thinning and Thickening boundaries, Convex <b>Steletons-Thinning and Thickening boundaries, Convex</b> <b>Steletons-Thinning and Thi</b>	gistration ng and Hull, T thres letectio	, LoG on; T Clos op Ha	ing c at Filt	<b>6 hc</b> orm <b>5 hc</b> operat ers <b>7 hc</b> Optin	ours near ours and ours ors,
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4MorpMorphological FilteRegion filling, ○bjectsModule:5ImagSegmentation:Pixelthresholding -Baye	<b>ge Enhancement</b> st stretching, histogram specification, local contrast enhan- ring, sharpening, spatial convolution, Gaussian smoothing <b>ge registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation. 	gistration ng and Hull, T thres letectio	, LoG on; T Clos op Ha	ing c at Filt	<b>6 hc</b> orm <b>5 hc</b> operat ers <b>7 hc</b> Optin	ours near ours and ours ors,
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4MorpMorphologicalFilteRegion filling, ObjectsModule:5ImagSegmentation:Pixelthresholding -Bayedetection/linking, Can	<b>e Enhancement</b> st stretching, histogram specification, local contrast enhan- ring, sharpening, spatial convolution, Gaussian smoothing <b>e registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation. 	gistration ng and Hull, T thres letectio	, LoG on; T Clos op Ha	ing c at Filt	<b>6 hc</b> orm <b>5 hc</b> operat ers <b>7 hc</b> Optin	ours near ours and ours ors, ours
Module:2ImagEnhancement, contrasand order statistic filteModule:3ImagRegistration:Mono-similarity measures forModule:4MorpMorphologicalFilteRegion filling, ObjectsModule:5ImagSegmentation:Pixelthresholding -Bayedetection/linking, CanModule:6Color	<b>The Enhancement</b> st stretching, histogram specification, local contrast enhan- ring, sharpening, spatial convolution, Gaussian smoothing <b>The registration</b> -modal/multimodal image registration; Global/local re- registration; Intensity/pixel interpolation. <b>Chological processing</b> <b>Steletons-Thinning and Erosion Operators, Opening</b> Skeletons-Thinning and Thickening boundaries, Convex <b>Steletons-Thinning and Thickening boundaries, Convex</b> <b>Steletons-Thinning and Thi</b>	, DoG, gistration ng and Hull, T thres letectio	, LoG on; T Clos op Ha holdin	ing c at Filt	<b>6 hc</b> orm <b>5 hc</b> operat ers <b>7 hc</b> Optim ors, <b>6</b> <b>5 hc</b>	ours ours and ours and ours ours ours





Mo	dule:7	Image/Object features e	xtraction			6 hours
Tex	xtural featur	es - gray level co-occurrence	matrix; Moments;	Connecte	d component analysis;	Convex hull;
Dis	stance transf	form, medial axis transform, s	skeletonization/th	inning, sha	ape properties	
Ma	dule:8	Contonentia				2 hours
		Contemporary issues				2 hours
Gu	est lecture d	y Industry Experts or R&D (	organization	Tot	al Lecture hours:	45 hours
Te	xt Book(s)					
1.	Rafael C. C	Gonzalez and Richard E. Wo	ods, Digital Image	e Processin	g, 4 <sup>th</sup> Edition, Pearson	, 2018.
2.	William K	. Pratt, Digital Image Process	ing, 4 <sup>th</sup> Edition, Jo	ohn Wiley,	2007.	
Ret	ference Bo	oks				
1.	Maria Petr	ou and Panagiota Bosdogia	nni, "Image Proc	essing: The	e Fundamentals", 2 <sup>nd</sup>	edition, John
	Wiley, 201	0				
2.	Kenneth F	R. Castleman, "Digital Image	Processing", 2 <sup>nd</sup> E	dition, Pea	arson, 2010	
Mo	de of Eval	uation: CAT / Assignment	/ Quiz / FAT /	' Project /	Seminar	
Re	commende	d by Board of Studies	29-01-2021			
Ap	proved by A	Academic Council	No. 61	Date	18-02-2021	



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course C	ode	Course Title	L	T	P	J	С
CBS40		Enterprise systems	3	0	2	0	4
Pre-requisite	2	NIL		Syllal			n
<u> </u>	•				v.1.0		
Course Obje							
		ssential concepts of ERP involved in business processes					
1		the design and implementation of ERP architecture					
3. To familia	arize with	various tools and technologies for developing ERP for l	arge p	project			
Expected Co		taama					
<b>İ</b>		id deploy simple web applications using MVC architectu	re				
	0	ERP models					
		id implement CRM models					
	0	ive network and application					
1		onal opportunities and challenges in the design system					
	0	nodel for ERP for large projects					
0. 11011111 10	uevelopi	nodel for EAT for large projects					
Module:1	Mode	1 - View - Control (MVC)architecture				61	hour
		AVC method of software development in a 3-tier en	viron	nent	Cont		
		environment.	viioin	nent ·	-Com	101 (1	VI V C
development	in a 3-uei	environment.					
Module:2	Tools	and Technologies				61	hours
<b>Module:2</b> Tools and Te		and Technologies es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja	vaScri	pt, Ai	ax and		hours
Tools and Te	chnologie	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja	vaScri	pt, Aja	ax and		hours
Tools and Te	chnologie	0	vaScri	pt, Aja	ax and		hour
Tools and Te Overview of	chnologie SAP and (	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja	vaScri	pt, Aja	ax and	1	
Tools and Te Overview of 3 Module:3	chnologie SAP and ERP 2	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications				8 1	hour
Tools and Te Overview of Module:3 Service Orier	SAP and ERP . Ited Arch	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules	sulatic	on - Ir	nter-o	1 <b>8 1</b> perab	-
Tools and Te Overview of Module:3 Service Orier Enterprise Re	AP and Control	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps	sulatic	on - Ir	nter-o	1 <b>8 1</b> perab	<b>hour</b> s
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Mar	Chnologie SAP and C ERP ated Arch assource P nagement	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encape lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules	sulatic	on - Ir	nter-o	l 81 perab nance	hours bility c, HR
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Mar Module:4	ERP 2 ERP 2 ERP 2 ERP 2 ERP 2 ERP 2	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies	sulatic ERP 1	n - Ir Modul	nter-o es: Fin	l 81 perab nance 71	hours ility , HR
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Mar Module:4 Business Pro	ERP and ERP an	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy	sulatic ERP M	on - Ir Modul Proces	nter-o es: Fin	1 <b>81</b> perab nance <b>71</b> -Elect	hours bility b, HR hours tronic
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Mar Module:4 Business Pro	ERP and ERP an	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies	sulatic ERP M	on - Ir Modul Proces	nter-o es: Fin	1 <b>81</b> perab nance <b>71</b> -Elect	hours bility b, HR hours tronic
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Mar Module:4 Business Pro Data Exchang	ERP 2 ERP 2 ated Arch esource P hagement ERP 2 cess Reer ge - Custo	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy omer Relationship Management (CRM) - Supplier Relation	sulatic ERP M	on - Ir Modul Proces	nter-o es: Fin	1 perab nance 71 -Elect nt (SI	hours bility c, HR hours tronic RM)
Tools and Te Overview of 3 <b>Module:3</b> Service Orier Enterprise Re Materials Mar <b>Module:4</b> Business Pro Data Exchang <b>Module:5</b>	ERP 2 ERP 2 ERP 2 ERP 2 ERP 2 ERP 2 Cess Reer ge - Custo ERP 1	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies ngineering - Decision Support System - On-Line Analy omer Relationship Management (CRM) - Supplier Relation Networking & Security	sulatic ERP M vtical l onship	on - Ir Modul Proces Mana	nter-o es: Fin ssing	l 81 perab nance 71 -Elect nt (SI 61	hours bility c, HR hours tronic RM)
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Mar Module:4 Business Pro Data Exchang Module:5 Overview of	ERP 2 ERP 2 Atted Arch esource P magement ERP 2 cess Reer ge - Custo ERP 1 MPLS - V	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Fechnologies agineering - Decision Support System - On-Line Analy omer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network m	sulatic ERP 1 vtical 1 onship	n - Ir Modul Proces Mana	nter-o es: Fin ssing geme	1 81 perab nance 71 -Elect nt (SI 61 force	hours bility c, HR hours tronic RM) hours ment
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Man Module:4 Business Pro Data Exchang Module:5 Overview of of policies - I	chnologie         SAP and 0         ERP         ated Arch         esource P         agement         ERP '         cess Reer         ge - Custo         ERP 1         MPLS - V         ERP Secu	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encape lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies agineering - Decision Support System - On-Line Analy omer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network m rity Issues – Authentication – Authorisation - Access co	sulatic ERP N vtical 1 onship	n - Ir Modul Proces Mana ring ar – Rol	nter-og es: Fin ssing - geme nd ent es - si	1 81 perab nance 71 -Elect nt (SI 61 force	hours bility c, HR hours tronic RM) hours ment
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Man Module:4 Business Pro Data Exchang Module:5 Overview of of policies - I	chnologie         SAP and 0         ERP         ated Arch         esource P         agement         ERP '         cess Reer         ge - Custo         ERP 1         MPLS - V         ERP Secu	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Fechnologies agineering - Decision Support System - On-Line Analy omer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network m	sulatic ERP N vtical 1 onship	n - Ir Modul Proces Mana ring ar – Rol	nter-og es: Fin ssing - geme nd ent es - si	1 81 perab nance 71 -Elect nt (SI 61 force	hours bility c, HR hours tronic RM) hours ment
Tools and Te Overview of 3 <b>Module:3</b> Service Orier Enterprise Re Materials Mar <b>Module:4</b> Business Pro Data Exchang <b>Module:5</b> Overview of of policies - 1 on -Directory	Chnologie SAP and C ERP A ated Arch esource P nagement, Cess Reer ge - Custo ERP 1 MPLS - V ERP Secu servers -	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies agineering - Decision Support System - On-Line Analy omer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network m rity Issues – Authentication – Authorisation - Access co Audit trails - Digital signatures – Encryption - review of	sulatic ERP N vtical 1 onship	n - Ir Modul Proces Mana ring ar – Rol	nter-og es: Fin ssing - geme nd ent es - si	1 81 perab hance 71 -Elect nt (SI 61 forcer ngle-	hour bility c, HR hour troni RM) hour ment sign-
Tools and Te Overview of 3 <b>Module:3</b> Service Orier Enterprise Re Materials Mar <b>Module:4</b> Business Pro Data Exchang <b>Module:5</b> Overview of of policies - I on -Directory <b>Module:6</b>	AP and Control SAP and Control	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encape lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies agineering - Decision Support System - On-Line Analy omer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network m rity Issues – Authentication – Authorisation - Access co Audit trails - Digital signatures – Encryption - review of ware Architectures for Enterprise Systems	sulation ERP 1 vtical 1 onship monito ontrol TIPSee	n - Ir Modul Proces Mana ring ar - Rol c - SSI	nter-og es: Fin ssing ageme nd ent es - si	1 81 perab hance 71 -Elect nt (Sl 61 forcer ngle- 51	hour ility , HR hour tronic RM) hour sign-
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Mar Module:4 Business Pro Data Exchang Module:5 Overview of of policies - I on -Directory Module:6 Software: Act	Chnologie SAP and C ERP an	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encaps lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies agineering - Decision Support System - On-Line Analy omer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network m rity Issues – Authentication – Authorisation - Access co Audit trails - Digital signatures – Encryption - review of ware Architectures for Enterprise Systems Process – Tendering - conditions of contract - Comme	sulatic ERP 1 vtical 1 onship nonito ontrol TIPSec ercial o	n - Ir Modul Proces Mana ring at – Rol c - SSI	nter-o es: Fin ssing geme nd en es - si	8 1 perab nance 7 1 -Elect nt (SI 6 1 forcer ngle- 5 1 f soft	hours bility c, HR hours tronic RM) hours sign- hours ware
Tools and Te Overview of 3 Module:3 Service Orier Enterprise Re Materials Mar Module:4 Business Pro Data Exchang Module:5 Overview of of policies - I on -Directory Module:6 Software: Ac (COTS) Impl	chnologie         SAP and 0         ERP         itted Arch         esource P         nagement,         ERP '         cess Reer         ge - Custor         ERP '         MPLS - V         ERP Secu         servers -         Soft         quisition	es: - Microsoft .NET framework, PHP, Ruby on Rails, Ja Oracle Applications Architecture and Generic Modules itecture (SOA) - Principles of loose coupling – encape lanning (ERP) systems and their architecture - Generic I , Investment - Examples of Domain Specific Modules Technologies agineering - Decision Support System - On-Line Analy omer Relationship Management (CRM) - Supplier Relation Networking & Security Virtual Private Networks (VPN) – Firewalls - Network m rity Issues – Authentication – Authorisation - Access co Audit trails - Digital signatures – Encryption - review of ware Architectures for Enterprise Systems	sulatic ERP 1 vtical 1 onship nonito ontrol TIPSec ercial o	n - Ir Modul Proces Mana ring at – Rol c - SSI	nter-o es: Fin ssing geme nd en es - si	8 1 perab nance 7 1 -Elect nt (SI 6 1 forcer ngle- 5 1 f soft	hours bility c, HR hours tronic RM) hours sign- hours ware



Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Mod	dule:7	Hardware Architectures	s for Enterprise	Systems		5 hours
Hare	dware: Serv	ers –Storage area networks -	Storage units - B	ack-up strate	gies - Local Area N	letwork
(LA	N) technolo	ogies and products - Data Ce	entres - Hardware	Acquisition	- Disaster Recovery	7
Mod	lule:8	Contemporary issues				2 hours
Gue	est lecture b	y Industry Experts or R&D	organization			
			—	Total Le	ecture Hours:	45 hours
Tex	tbook				·	
1.	Alexis Le	on, Enterprise Resource Pla	nning, 2020,4 <sup>th</sup> E	dition, Tata N	AcGraw Hill.	
Refe	erence Boo					
1.	Kurbel, K	K. E., Enterprise Resource P	lanning and Supp	lv Chain Mar	nagement, 2016, Spi	ringer.
2.		K, Sanjay M, Anbuudayas				
		ntals of Design and Implem				
Mod		ation: CAT / Assignment		. 0	Seminar	
WIO		auon. CAT / Assignment		/ 110jeet / 3		
τ.,	6.01 11	· E · // 1'	· .			
1.		nging Experiments (Indica				
1. 2.		an ASP.NET MVC web app he client/server architecture		ow to use the	user interface	
2. 3.	*	stomer, material master data				
<u> </u>		nodel of customer relationsh		1		s for catalogue
	and onlin		np management		intelligence system	, ioi catalogue
5.		nodel of Supplier Relationsh	nip Management f	for Healthcar	e system	
6.		e and test a VPN connection			<u>,</u>	
7.	Firewalls	configuration		•		
8.		nfiguration and implementa				
9.	Use CAS	E tools to aid ERP Software	acquisition proc	ess - Case stu	dy	
10.	Use CAS	E tools to aid ERP hardware	e acquisition proc			
					l Laboratory Hou	rs: 30 hours
Ma		ssments: Assessments/Mi		AT		
			1			
Rec		d by Board of Studies Academic Council	22-05-2021 No. 62	Date	15-07-2021	



B. Tech Computer Science and Engineering and Business Systems

### **UNIVERSITY CORE**

## (AY 2021 - 2022)

B. Tech. Computer Science and Engineering and Business Systems

(in collaboration with TCS)



Sl. No.	<b>Course Code</b>	Course Title	Page No.
1.	CBS1002	Object Oriented Programming	104
2.	CBS1901	Technical Answers for Real World Problems (TARP)	106
3.	CBS1902	Industrial Project	107
4.	CBS1903	Comprehensive Examination	108
5.	CBS1904	Capstone Project	110
6.	CHY1701	Engineering Chemistry	111
7.	CSE1008	Programming in C	114
8.	ENG1013	Business Communication and Value Science - I	117
9.	ENG1014	Business Communication and Value Science - II	119
10.	ENG1017	Business Communication and Value Science - III	121
11.	ENG1018	Business Communication and Value Science - IV	123
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15.	HUM1021	Ethics and Values	133
16.	MAT1017	Probability and Statistics	135
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18.	PHY1005	Modern Physics	139
19.	FLC4097	Foreign Language Course Basket	141



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course C	ode	Course Title	L	Τ	Р	J	C
CBS1002		Object Oriented Programming	3	0	2	0	4
Pre-requisite	Ν	IL	Sy	llabu	s ver	sion	
				V.	. 1.0		
Course Object							
-		cteristics of OOP through C++.					
1		ious kinds of overloading and inheritance.					
3. To introdu	ce pointers	and file handling in C++ together with exception ha	indling mee	chanis	m.		
Expected Cou	rse Outcon	ne:					
After completio	on of this co	urse, students will be able to:					
1. Realize the	need and f	eatures of OOP and idealize how C++ differs from O	С.				
2. Infer know	vledge on va	rious types of overloading.					
3. Choose sui	table inheri	ance while proposing solution for the given problem	1.				
4. Handle por	inters and e	fective memory management.					
5. Illustrate a	pplication of	f pointers in virtual functions.					
6. Demonstra	ate file hand	ling in C++ and handle exceptions.					
		knowledge by applying the learned techniques to solv	ve various	real-w	orld		
problems							
Providence	-						
-		tion				2 ho	
Module:1	Introdu			abar		3 ho	
Module:1	Introdu	rogramming? Why do we need object oriented? Pro	ogramming	; chara			
Module:1 What is object object-oriente	Introdu tt-oriented f d languages	rogramming? Why do we need object oriented? Pro	ogramming	; chara	acteri	stics	of
Module:1 What is object object-oriente Module:2	Introdu it-oriented p d languages C++ Pr	rogramming? Why do we need object oriented? Pro			acteri		of
Module:1 What is object object-oriente Module:2	Introdu it-oriented p d languages C++ Pr	rogramming? Why do we need object oriented? Pro			acteri	stics	of
Module:1 What is object object-oriente Module:2	Introdu t-oriented p d languages C++ Pr cout. Direc	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulat			ions.	stics	of
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading	Introdu t-oriented p d languages C++ Pr cout. Direc Operate unary ope	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulate or overloading: rations. Overloading binary operators, data con	or, Type co	onvers	ions.	stics 4 ho 7 ho	of
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading	Introdu t-oriented p d languages C++ Pr cout. Direc Operate unary ope	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulat	or, Type co	onvers	ions.	stics 4 ho 7 ho	of
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading	Introdu t-oriented p d languages C++ Pr cout. Direc Operate unary ope	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulate or overloading: rations. Overloading binary operators, data con on keywords. Explicit and Mutable.	or, Type co	onvers	ions.	stics 4 ho 7 ho	urs
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading a Module:4	Introdu it-oriented p d languages C++ Pr cout. Direc Operato unary ope nd convers: Inherita	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulate or overloading: rations. Overloading binary operators, data con on keywords. Explicit and Mutable.	or, Type co version, p	onvers	ions.	stics 4 ho 7 ho oper 8 ho	
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading a Module:4 Concept of i	Introdu t-oriented p d languages C++ Pp cout. Direct Operate unary ope nd conversa Inheritance.	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulate or overloading: rations. Overloading binary operators, data con on keywords. Explicit and Mutable.	or, Type co version, p astructors,	onvers	ions. of	stics 4 hor 7 hor oper 8 hor uncti	
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading a Module:4 Concept of i inheritance in	Introdu it-oriented p d languages C++ Pr cout. Direc Operate unary ope nd conversa Inheritance. heritance.	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulate or overloading: rations. Overloading binary operators, data con on keywords. Explicit and Mutable. nce Derived class and based class. Derived class con	or, Type co version, p structors, graphics s	onvers itfalls memt hapes	of oer f	stics 4 hor 7 hor oper 8 hor uncti	
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading a Module:4 Concept of i inheritance in	Introdu t-oriented p d languages C++ Pr cout. Direct Operato unary ope nd converse Inheritance. n the Engli tance, aggre	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulate or overloading: rations. Overloading binary operators, data con on keywords. Explicit and Mutable. nce Derived class and based class. Derived class con h distance class, class hierarchies, inheritance and	or, Type co version, p structors, graphics s	onvers itfalls memt hapes	of of of t.	stics 4 hor 7 hor oper 8 hor uncti	
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading overloading a Module:4 Concept of i inheritance ir private inheri Module:5	Introdu it-oriented p d languages C++ Pr cout. Direct Operato unary ope nd conversa Inheritance. n the Engli tance, aggro	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulate or overloading: rations. Overloading binary operators, data con on keywords. Explicit and Mutable. nce Derived class and based class. Derived class con h distance class, class hierarchies, inheritance and gation: Classes within classes, inheritance and progr	or, Type co version, p structors, graphics s ram develop	onvers itfalls memb hapes pmen	ions. of per f , pul t.	stics 4 hor 7 hor oper 8 hor uncti olic 2 7 hor	
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading a Module:4 Concept of i inheritance in private inheri Module:5 Addresses an	Introdu t-oriented p d languages C++ Pr cout. Direct Operato unary ope nd converse Inheritance. heritance, aggro Pointer nd pointer	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulate or overloading: rations. Overloading binary operators, data con on keywords. Explicit and Mutable. nce Derived class and based class. Derived class con h distance class, class hierarchies, inheritance and gation: Classes within classes, inheritance and progr & Virtual Function	or, Type co version, p nstructors, graphics s ram develop rrays. Poir	itfalls memb hapes pmen	of of of t.	stics 4 hor 7 hor oper 8 hor uncti olic a 7 hor Facti	
Module:1 What is object object-oriente Module:2 Output using Module:3 Overloading overloading a Module:4 Concept of i inheritance ir private inheri Module:5 Addresses ar pointer and	Introdu tt-oriented p d languages C++ Pr cout. Direct Operate unary ope nd converse Inheritance. heritance, aggre Pointer nd pointer C-types str	rogramming? Why do we need object oriented? Pro ogramming Basics tives, Input with cin, Type bool, The setw manipulate or overloading: rations. Overloading binary operators, data con on keywords. Explicit and Mutable. nce Derived class and based class. Derived class con h distance class, class hierarchies, inheritance and gation: Classes within classes, inheritance and progr & Virtual Function . The address of operator and pointer and as	or, Type co version, p structors, graphics s ram develop rrays. Poir nters to o	memb hapes pmen	ions. of oer f , pul t. und , del	stics 4 hor 7 hor oper 8 hor uncti olic a 7 hor Facti ouggi	ur ate



# Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Mo	dule:6	Streams And Files				8 hours
Stre	ams classe	s, Stream Errors, Disk File I/0	O with streams, fil	e pointers,	error handlin	ng in fileI/O with
mer	nber func	tion, overloading the extracti	on and insertion	operators,	memory as	a stream object,
com	nmand line	arguments, and printer output.				
	dule:7	Generic Programming and				6 hours
Fun	ction temp	plates, Class templates, Exception	on handling technic	ues.		
		L				
	dule:8	Contemporary Issues				2 hours
Gue	est lecture	oy Industry Experts or R&D of	-			
			, , , , , , , , , , , , , , , , , , ,	otal Lectu	are hours:	45 hours
	t Book(s)					
1.		n Jana, "C++ and Object-Ories	nted Programming	Paradıgm''	Third Editic	n, PHIPublishers,
	2014.	"O1' + O ' + 1 D	· 1.C++?	D 1 D	1 NT	
2.	2007.	nm, "Object Oriented Program	nming and C++,	Kevised E	attion, New	Age International,
Rof	erence Bo	oke				
1.		Mh Thaker, "Programming In	C++" First Editio	n USA IS'	TE 2002	
2.		B. Lippman, Josée Lajoie and B				on O'Reilly 2013
	-	uation: CAT / Assignment /				511,0 Hemy, 2015.
		,				
List	t of Challe	nging Experiments (Indicat	ive)			
1.	1	amental constructs in C++ incl		Objects		
2.		tructors and Destructors		,		
3.	Type	s of Overloading				
4.		s of inheritance				
5.	71	ers and Inheritance				
6.	Virtu	al Functions				
7.	File s	treams				
	1		T	otal Labor	ratory hours	20 hours
M	ode of Ass	essments: Assessments/Mic			•	
Re	commend	led by Board of Studies	07-06-2019			
Ap	proved by	Academic Council	No. 55	Date	13-06-2019	



Course Code		Course Title	2		L T P J C
CBS1901	Technical Answ	vers for Real Wor	ld Proble	ms (TARP)	1 0 0 4 2
Pre-requisite	115 Credits Earned				Syllabus version
					v. 1.0
Course Objectiv	res:				
1. To help studen	nts to identify the need for	r developing new	er technol	ogies for indu	strial/societal needs
2. To train stude	ents to propose and imp	plement relevant	technolog	y for the dev	velopment of the
prototypes / p					
	students learn to the u	se the methodole	ogies avai	lable for ana	lyzing the developed
prototypes / p	roducts				
Expected Cours	e Outcome:				
At the end of the	course, the student will	be able to			
1. Identify real l	ife problems related to so	ociety			
2. Apply approp	priate technology(ies) to a	ddress the identifi	ed proble	ms using engi	neering principles and
arrive at inno	vative solutions				
Module1					15 hours
1. Identification	of real-life problems				
2. Field visits ca	n be arranged by the facu	lty concerned			
3. $6 - 10$ studen	ts can form a team (withi	n the same / diffe	erent discip	pline)	
4. Minimum of	eight hours on self-manag	ged team activity			
5. Appropriate s	cientific methodologies t	o be utilized to so	lve the ide	entified issue	
6. Solution sho	ould be in the form	n of fabrication	n/coding/	modeling/pro	oduct design/process
design/releva	nt scientific methodology	v(ies)			
7. Consolidated	report to be submitted for	or assessment			
8. Participation,	involvement and contri	bution in group	discussion	s during the	contact hours will be
used as the m	odalities for the continue	ous assessment of	the theory	component	
9. Project outco	me to be evaluated in te	rms of technical,	economic,	social, enviro	onmental, political and
demographic	feasibility				
	of each group member to				
	omponent to have three				
	tion: (No FAT) Contin		- /		lark weightage of
	et report to be submitte		and proje	ct reviews	
	by Board of Studies	29-01-2021		40.00.000	
Approved by Ac	ademic Council	No:61	Date	18-02-202	1



Course Code		<b>Course Title</b>			L	Т	Р	J	С
CBS1902		Industrial Project			0	0	0	0	1
Pre-requisite	Completion of min	nimum of Two seme	esters	6		Sylla	bus	versio	n
*	-					v.1			
<b>Course Objectives</b>	:								
The course is desig	gned so as to expose	the students to indus	stry e	nvironm	ent an	d to ta	ake u	ıp on-	site
assignment as traine	ees or interns.								
Expected Course	Outcome:								
At the end of this in	ternship the student sl	hould be able to:							
1. Have an exposu	re to industrial practice	es and to work in team	ns						
2. Communicate e	ffectively								
<b>2.</b> Communeate e	110001.01								
	impact of engineerin	g solutions in a glob	al, ec	onomic,	enviro	onmen	tal ar	nd soo	cietal
	5	g solutions in a glob	al, ec	onomic,	enviro	onmen	tal ar	nd soo	cietal
3. Understand the context	5					onmen	tal ar	nd soo	cietal
<ol> <li>Understand the context</li> <li>Develop the abit</li> </ol>	impact of engineerin					onmen	tal ar	nd soo	cietal
<ol> <li>Understand the context</li> <li>Develop the abit</li> <li>Comprehend context</li> </ol>	impact of engineerin lity to engage in resear- ontemporary issues	ch and to involve in li				onmen	tal ar	nd soo	cietal
<ol> <li>Understand the context</li> <li>Develop the abit</li> <li>Comprehend context</li> </ol>	impact of engineerin	ch and to involve in li				onmen	tal ar	nd soo	cietal
<ol> <li>Understand the context</li> <li>Develop the abit</li> <li>Comprehend context</li> </ol>	impact of engineerin lity to engage in resear- ontemporary issues	ch and to involve in li				onmen	tal ar		cietal
<ol> <li>Understand the context</li> <li>Develop the abia</li> <li>Comprehend context</li> <li>Engage in estable</li> </ol>	impact of engineerin lity to engage in resear- ontemporary issues lishing his/her digital f	ch and to involve in li				onmen	tal ar		
<ol> <li>Understand the context</li> <li>Develop the abia</li> <li>Comprehend context</li> <li>Engage in estable</li> </ol> Contents	impact of engineerin lity to engage in resear- ontemporary issues lishing his/her digital f	ch and to involve in li				onmen	tal ar		
<ol> <li>Understand the context</li> <li>Develop the abia</li> <li>Comprehend context</li> <li>Engage in estable</li> </ol> Contents	impact of engineerin lity to engage in resear ontemporary issues lishing his/her digital f	ch and to involve in li				onmen	tal ar		
<ol> <li>Understand the context</li> <li>Develop the abia</li> <li>Comprehend context</li> <li>Engage in estab</li> </ol> Contents Four weeks of work Supervised by an example.	impact of engineerin lity to engage in resear ontemporary issues lishing his/her digital f	ch and to involve in li	fe-lor	ng learni	ng	onmen	tal ar		
<ol> <li>Understand the context</li> <li>Develop the abia</li> <li>Comprehend context</li> <li>Engage in estab</li> </ol> Contents Four weeks of work Supervised by an example.	impact of engineerin lity to engage in resear ontemporary issues lishing his/her digital f at industry site. pert at the industry.	ch and to involve in li	fe-lor	ng learni	ng	onmen	tal ar		



B. Tech Computer Science and Engineering and Business Systems

Course Code	Course Title	L	Т	Р	J	С
CBS1903	Comprehensive Examination	0	0	0	0	1
Pre-requisite	Minimum of 115 credits should be earned	S	yllabı	is ve	ersion	n
			v	. 1.0		
<b>Course Objectives:</b>						
To orrelucto the orrest	I understanding of the students in the core gross of B	Tech	CSE /	nd 1	2	

To evaluate the overall understanding of the students in the core areas of B. Tech CSE and Business Systems

### **Expected Course Outcome:**

At the end of the course, the student will be able to

1. Define, explain, evaluate, and interpret the fundamental knowledge pertaining to the field domain of Computer science and Engineering and apply that essential knowledge to the field of Business systems.

### Module:1 | Programming in C, Object Oriented Programming, Data Structures and Algorithms

C fundamentals – Iterations, Arrays-Pointers, Functions, Structures. C++ classes, Objects, Inheritance, Virtual function- Exception Handling-Generic Templates-Files. Asymptotic Notations- The Big-O, Omega and Theta notation- Stack, Queue, Linked List, Applications of Stack, Queue, and Linked List. - Tree, Binary Tree, Tree Traversals, Binary Search Tree- Graph, Minimum Spanning Tree, Shortest Path Algorithm-Searching - Binary, Linear, BFS, DFS-. Sorting - Insertion, Selection, Shell, Quick and Merge Sort.

## Module:2 Design and analysis of Algorithms, Computer Organization and Architecture, Formal languages and Automata theory

Classes of complexity, Analyzing the Time and Space complexity- Iterative and recursive, Algorithmic strategies: Brute force, Greedy, Dynamic programming, Graph algorithms: DFS, BFS, MST, Shortest path algorithm. Instructions-Addressing Modes-Instruction Pipelining-Data Representation-Characteristics of Memories- Memory Hierarchy-Cache Memory- I/O fundamentals- I/O Techniques -Direct Memory Access - Interrupts RAID architecture-Flynn's classification. Finite Automata-Deterministic Finite Automata, Non- Deterministic Finite Automata-Equivalence of NFA and DFA-Applications of NFA-Finite Automata with Epsilon Transition- Regular Languages, Building Regular Expressions, DFA to Regular Expressions-Pumping Lemma for Regular Language-Applications of Pumping Lemma-Context Free Grammar-Derivations and Definitions-Language of a Grammar, Inferences and Ambiguity-Sentential Forms-Construction and Yield of a Parse Tree-PDA-Acceptance by Final State-PDA-Acceptance by Empty Stack-Turing Machine and Halting Problem-Multitape Turingmachines.

Module:3Principles of Operating Systems, Database systems, Software Engineering<br/>Methodologies



### VIT® Vellore Institute of Technology

### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Operating System Services, OS Types, Process, System Calls, CPU Scheduling Algorithms, Inter-Process Communication, Deadlock, Memory Allocation, Virtual Memory, Paging, Segmentation, Page Replacement Algorithms, File Allocation Methods, Directory Implementation Methods, I/O Devices, Disk Scheduling algorithms. Data Abstraction, Data Independence, Entity-Relationship Model, Relational Model,

Integrity Constraints, Functional Dependencies, Normal Forms, Dependency Preservation, Relational Algebra, Query Optimization, Transaction Processing, Concurrency Control and Recovery Techniques, Database Storage Strategies, Authentication and Authorization. Process Models- Cost benefit Analysis-COCOMO model- DFD- ER-Design models- Object Oriented Design-Testing- Levels of Testing-Software Project Management-Project Scheduling-Risk Analysis-Quality Metrics- Configuration Management.

Module:4 Computer Networks, Information security

Computer networks and distributed systems, Classifications of computer networks, Various Connection Topology, Protocols and Standards, OSI model, Transmission Media, LAN, Bandwidth utilization, Error Detection and Error Correction, Flow Control and Error control protocols, Logical addressing, UDP,TCP, Congestion Control, Quality of Service (QoS), DNS, DDNS, TELNET, EMAIL, FTP, WWW, HTTP, SNMP, Bluetooth, Firewalls, Basic concepts of Cryptography. Confidentiality, integrity and availability -Discretionary, mandatory, roll-based and task-based models - Spatio-temporal models - Confidentiality policies, integrity policies, hybrid policies - Control of access and information flow - Data privacy, introduction to digital forensics – Security Architecture (Operating Systems, Database)

Module:5	Introduction	to IP 1	management	and	Entrepreneu	irship, Fundan	nentals of
	Management,	Marketi	ng Research	&	Marketing	management,	Financial
	management						

Strategic Management, Business Processes and Capabilities-based Approach to Strategy, Five Forces of Industry Attractiveness that Shape Strategy, Mergers & Acquisitions, Corporate Governance, Leadership Styles, Change Management, Contribution of Management Thinkers: Taylor, Fayol, Elton Mayo etc., Work Stress and Stress Management, Organizational structure, Organizational Culture, Managerial Ethics, Corporate social responsibility, Attributes of a leader, Contemporary issues in management, Concept of IP Management, Use in marketing, Debt, Venture Capital and other forms of Financing, Types of Intellectual Property, Elements of Marketing Mix, Analyzing needs & trends in Environment - Macro, Economic, Political, Technical & Social, Product Life cycle concept, New Product development & strategy, Marketing Channels in retailing, Marketing Communication, Marketing Research Techniques, Strategy and Planning for Internet Marketing, Relationship, networks and customer relationship management, Business to Business marketing strategy, Financial Environments, The Capital Asset Pricing Model (CAPM), Analysis in leverage study.

Mode of Evaluation: CAT / Assignment /	' Quiz / FAT / L	ab	
Recommended by Board of Studies	29-01-2021		
Approved by Academic Council	No. 61	Date	18-02-2021



	Course Code	Cours	e Title		]		Т	Р	J	С
	CBS1904	Capstone	Project		(	)	0	0	0	12
Р	re-requisite	As per the academ	nic regulations		5	Syllal	ous	s ver	sion	
							7	7. 1.0		
C	Course Objectives:				·					
	-	hands-on learning exp		0	-	men	t a	nd a	nalys	sis of
SI	uitable process so as t	o enhance the technica	l skill sets in the c	chosen field						
	Expected Course Ou									
А		se the student will be a								
]	-	c problem statements	for ill-defined real	life proble	ms with re	ason	abl	e ass	ump	tions
	and constraints.									
		e search and / or paten								
		ents / Design and Ana	-	erations and	d documer	it the	re	sults.		
		alysis / benchmarking	8							
4	•	sults and arrive at scien		-	/ solution					
(	6. Document the re-	sults in the form of tec	hnical report / pr	esentation						
	Contents	<u> </u>								
1.	- ,	hay be a theoretical ar			-					•
		orrelation and analysis	s of data, softwa	re develop	ment, app	lied i	es	earch	n and	1 any
2	other related activiti					. 1	- C			
2.	the academic regulat	ne or two semesters ba	ised on the compl	etion of rec	juired nun	iber	)[	creai	ts as	per
3.	0	ork or a group project,	with a maximum	of 3 stude	ate					
<i>3</i> .		pjects, the individual pr				cify t	he	indi	vidua	al's
1.	contribution to the		oject report of ca		situdid spe	city t	IIC.	mai	vicua	13
5.		r outside the university	in any relevant in	ndustry or 1	esearch in	stitut	101	۱.		
6.		peer reviewed journals	•						tage	
	···· ···· ···· ··· ··· ··· ··· ···		,							
N	Iode of Evaluation:	Periodic reviews, Pre	esentation. Final	oral viva.	Poster su	bmis	sid	on		
	Recommended by Bo		29-01-2021							
	pproved by Academ		No:61	Date	18-02-2	021				





Course Code	Course Title	L	T	Р	J	C
CHY1701	Engineering Chemistry	3	0	2	0	4
Pre-requisite	Chemistry of 12 <sup>th</sup> standard or equivalent		Syll	abu	s vers	sion
				v. 1	.0	
Course Objectives:						
1. To impart technolo	gical aspects of applied chemistry					
2. To lay foundation f	or practical application of chemistry in engineering asp	ects				
Expected Course Outco	me:					
1. Students will be familia	ar with the water treatment, corrosion and its control, o	engin	eering	g app	olicati	ons of
polymers, types of fue	els and their applications, basic aspects of electrocher	nistry	y and	elec	troch	emical
energy storage devices						
	ter Technology				hours	
Characteristics of hard wa	ter - hardness, DO, TDS in water and their determina	tion -	– nun	neric	al pro	oblems
in hardness determination	on by EDTA; Modern techniques of water analy	ysis	for i	ndu	strial	use -
Disadvantages of hard war	ter in industries.					
Module: 2 W	ater Treatment					
	ater i reatment			8	hours	5
Water softening method	s: - Lime-soda, Zeolite and ion exchange processo	es an	nd the			
0				eir a	applic	ations.
Specifications of water fo	s: - Lime-soda, Zeolite and ion exchange processe	volve	ed in	eir <i>a</i> wate	applic er trea	ations. atment
Specifications of water for for municipal supply - S	s: - Lime-soda, Zeolite and ion exchange processo or domestic use (ICMR and WHO); Unit processes in	volve rinat	ed in ion; 1	eir <i>a</i> wate Dom	applic er trea nestic	ations. atment water
Specifications of water for for municipal supply - S purification – Candle file	s: - Lime-soda, Zeolite and ion exchange processo or domestic use (ICMR and WHO); Unit processes in Sedimentation with coagulant- Sand Filtratio - chlo	volve rinat	ed in ion; 1	eir <i>a</i> wate Dom	applic er trea nestic	ations. atment water
Specifications of water fo for municipal supply - S purification – Candle file	s: - Lime-soda, Zeolite and ion exchange processo or domestic use (ICMR and WHO); Unit processes in Sedimentation with coagulant- Sand Filtratio - chlo tration- activated carbon filtration; Disinfection met	volve rinat	ed in ion; 1	eir <i>a</i> wate Dom	applic er trea nestic	ations. atment water
Specifications of water fo for municipal supply - S purification – Candle filt treatment, Ozonolysis, Re	s: - Lime-soda, Zeolite and ion exchange processo or domestic use (ICMR and WHO); Unit processes in Sedimentation with coagulant- Sand Filtratio - chlo tration- activated carbon filtration; Disinfection met	volve rinat	ed in ion; 1	eir <i>a</i> wate Dom	applic er trea nestic tratio	ations. atment water n, UV
Specifications of water for for municipal supply - S purification – Candle filt treatment, Ozonolysis, Re Module: 3	s: - Lime-soda, Zeolite and ion exchange processo or domestic use (ICMR and WHO); Unit processes in Sedimentation with coagulant- Sand Filtratio - chlo tration- activated carbon filtration; Disinfection met verse Osmosis; Electro dialysis.	volve orinat thods	ed in ion; 1 s- Ult	eir <i>a</i> wate Dom erafil	applic er trea nestic tratio	ations. atment water n, UV 6 hour
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B. Tech Computer Science and Engineering and Business Systems

sensitized solar cells - working principles, characteristics and applications.

#### Fuels and Combustion Module: 6

8 hours Calorific value - Definition of LCV, HCV. Measurement of calorific value using bomb calorimeter and Boy's calorimeter including numerical problems. Controlled combustion of fuels - Air fuel ratio minimum quantity of air by volume and by weight-Numerical problems-three way catalytic converterselective catalytic reduction of NOX; Knocking in IC engines - Octane and Cetane number - Antiknocking agents.

Module: 7 Polymers

Difference between thermoplastics and thermosetting plastics; Engineering application of plastics - ABS, PVC, PTFE and Bakelite; Compounding of plastics: molding of plastics for Car parts, bottle caps (Injection molding), Pipes, Hoses (Extrusion molding), Mobile Phone Cases, Battery Trays, (Compression molding), Fiber reinforced polymers, Composites (Transfer molding), PET bottles (blow molding); Conducting polymers - Polyacetylene- Mechanism of conduction - applications (polymers in sensors, selfcleaning windows)

Modu	le: 8	Contemporary issues:	2 hour
Lectur	e by Industry	Experts	
		Total Lecture hours:	45 hour
	Book(s)		
		a, A Text book of Engineering Chemistry, Dhanpat Rai Publishing Co.	, Pvt. Ltd.,
]	Educational a	and Technical Publishers, New Delhi, 3rd Ed., 2015.	
2.	O.G. Palanna	a, McGraw Hill Education (India) Pvt. Ltd., 9th Reprint, 2015.	
3. ]	B. Sivasankar	; Engineering Chemistry 1st Ed., McGraw Hill Education, 2008	
4.	"Photovoltaic	c Solar Energy: From Fundamentals to Applications", Angèle Reinders e	t al., Wiley
1	publishers, 20	017.	
Refere	ence Books		
1	O.V. Roussal	k and H.D. Gesser, Applied Chemistry - A Text Book for Engineers and Te	chnologists,
		nce Business Media, New York, 2 <sup>nd</sup> Edition, 2013.	0,
	1 0	Text book of Engineering Chemistry, S. Chand & Co Ltd., New Delhi, $20^{th}$ Ec	lition 2013
	0. 0. <b>D</b> aia, 11	Text book of Englicering Chemistry, 5. Chand & Go Edu, 140 Deni, 20	111011, 2013.
Mode	of Evaluation	on: Internal Assessment (CAT, Quizzes, Digital Assignments) & FAT	
	f Experimen		
1.	Water Purif	ication: Estimation of water hardness by EDTA method and its removal by	3 hours
	ion-exchang		
		ity Monitoring:	6 hours
2.		of total dissolved oxygen in different water samples by Winkler's method	
3.		of sulphate/chloride in drinking water by conductivity method	
4/5.		alysis: Quantitative colorimetric determination of divalent metal ions of	6 hours
	Ni/Fe/Cu ı	using conventional and smart phone digital-imaging methods	
6.	Arduino mi	crocontroller-based Sensor monitoring pH/temperature/conductivity in	3 hours

6 hours



7.	Iron in carbon steel by potentiometry	3 hours
8.	Construction and working of an Zn-Cu electrochemical cell	3 hours
9.	Determination of viscosity-average molecular weight of different natural/synthetic polymers	6 hours
10.	<ul> <li>Preparation/demonstration of a working model relevant to syllabus. Ex.</li> <li>1. Construction and working of electrochemical energy system – students should demonstrate working of the system.</li> <li>2. Model corrosion studies (buckling of Steel under applied load).</li> <li>3. Demonstration of BOD/COD</li> </ul>	Non- contact hours
	de of Evaluation: CAT / Assignment / Quiz / FAT / Lab ommended by Board of Studies 31-05-2019	

Recommended by Doard of Studies	51 05 2015			
Approved by Academic Council	No:55	Date	13-06-2019	



### VIID<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

### CURRICULUM (2022 - 2023)

Course C	Code	Course Title	L	Τ	Р	J	С
CSE100	08	Programming in C	3	0	2	0	4
Pre-requisite		NIL	Sy	llabı	is vei	rsion	
					v.1.0		
Course Objecti							
-	-	lem solving skills through general problem solving concep	-				
1		dge on programming essentials using C as implementation					
3. To introduce	e the Unix fi	le system interface and introduce various programming m	neth	odsu	sing (	2.	
Expected Cour							
1		arse, students will be able to:					
1		given problem using algorithm and flowchart designs.			1		
2. Infer the fu in C.	indamental f	programming elements in C language and learn to apply b	Dasic	cont	rol st	ructu	res
	o constilitio	es of modular programming approach in C and demonstra	ato t	hoca	main	that	raal
world scena	-	s of modular programming approach in C and demonstra	att t	ncsa		uic	Cai
		orinciples of pointers and their association with various	dat:	stru	ctures	s dur	ino
implementa	-	sinciples of pointers and their association with validus	and	i otra	eture	o dui	
1		cations of structures and unions.					
		output and error handling functions in C while solvir	ng t	he g	iven 1	orobl	em
	ix system in		0	0	1	-	
7. Showcase the	he attained k	knowledge by applying them to solve various real-world p	robl	ems.			
Module:1	General Pr	oblem-Solving Concepts				3 ho	urs
Algorithm and	Flowchart f	for problem solving with Sequential Logic Structure, I	Dec	ision	s and	l Lo	ops.
	uages: Intro	duction to imperative language; syntax and constructs	of a	ı spe	cific	langu	lage
(ANSI C)							
	-						
Module:2		erator and Expressions with discussion of variable arian Notation	nan	ning		4 ho	urs
Variable Names	, Data Typ	e and Sizes (Little Endian Big Endian), Constants, De	eclar	ation	is, Ai	rithm	etic
	-	ators, Logical Operators, Type Conversion, Increment I			-		
	0	ent Operators and Expressions, Precedence and Order	of l	Evalu	ation	n, pro	pe
variable naming	and Hungar	ian Notation					
	0 1 -				-		
Module:3			stru	ictur	ed	7 ho	urs
	programm	6		•		. т	L 1
		-Else-If, Switch, Loops - while, do, for, break and o	cont	inue,	G01	to La	Del
structured and u	n- structure	a programming					





B. Tech Computer Science and Engineering and Business Systems

Module:4	Functions and Program Structure with discussion on standard library	6 hours
Basics of fun	ctions, parameter passing and returning type, C main return as integer, Ext	ternal, Auto,
Local, Static,	Register Variables, Scope Rules, Block structure, Initialisation, Recursion, Pr	eprocessor,
Standard Libra	ry Functions and return types	
Module:5	Pointers and Arrays	8 hours
Pointers and	address, Pointers and Function Arguments, Pointers and Arrays, Address	Arithmetic
character Poin	nters and Functions, Pointer Arrays, Pointer to Pointer, Multi-dimensional	l array and
Row/column	major formats, Initialisation of Pointer Arrays, Command line arguments,	Pointer to
functions, com	plicated declarations and how they are evaluated.	
Module:6	Structures & Input/Output	9 hours
	res, Structures and Functions, Array of structures, Pointer of structures,	
	ble look up, Typedef, Unions, Bit-fields.	o on rerena
	itput: Standard I/O, Formatted Output - printf, Formated Input - scanf, Var	iable lengt
1	file access including FILE structure, fopen, stdin, sdtout and stderr, Erro	e
-	perror and error.h, Line I/O, related miscellaneous functions	
menuality exit.		
menualing exit,	perior and errorin, Ene 1/0, related miscenarcous functions	
	· · · · · · · · · · · · · · · · · · ·	6 hours
Module:7	Unix system Interface & Programmingmethods	
Module:7 File Descripto	Unix system Interface & Programmingmethods r, Low level I/O - read and write, Open, create, close and unlink, Random a	
Module:7 File Descripto Discussions or	Unix system Interface & Programmingmethods           or, Low level I/O - read and write, Open, create, close and unlink, Random a Listing Directory, Storage allocator.	ccess -Isee
Module:7 File Descripto Discussions of Programming	Unix system Interface & Programmingmethods r, Low level I/O - read and write, Open, create, close and unlink, Random a	ccess -Isee
Module:7 File Descripto Discussions of Programming	Unix system Interface & Programmingmethods           or, Low level I/O - read and write, Open, create, close and unlink, Random a Listing Directory, Storage allocator.	
Module:7 File Descripto Discussions or	Unix system Interface & Programmingmethods           or, Low level I/O - read and write, Open, create, close and unlink, Random a Listing Directory, Storage allocator.	ccess -Isee
Module:7 File Descripto Discussions or Programming utility. Module:8	Unix system Interface & Programmingmethods         r, Low level I/O - read and write, Open, create, close and unlink, Random a         n Listing Directory, Storage allocator.         Method: Debugging, Macro, User Defined Header, User Defined Library Func         Contemporary Issues	tion, makefi
Module:7 File Descripto Discussions or Programming utility. Module:8	Unix system Interface & Programmingmethods         or, Low level I/O - read and write, Open, create, close and unlink, Random a         n Listing Directory, Storage allocator.         Method: Debugging, Macro, User Defined Header, User Defined Library Func         Contemporary Issues         y Industry Experts or R&D organization	tion, makefi
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Module:7 File Descripto Discussions or Programming utility. Module:8 Guest lecture by	Unix system Interface & Programmingmethods         or, Low level I/O - read and write, Open, create, close and unlink, Random a         n Listing Directory, Storage allocator.         Method: Debugging, Macro, User Defined Header, User Defined Library Func         Contemporary Issues         y Industry Experts or R&D organization         Total Lecture hours:	tion, makefi
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Module:7         File Descripto         Discussions of         Programming         utility.         Module:8         Guest lecture by         Text Book(s)         1.       B. W. K.         2015.	Unix system Interface & Programmingmethods         or, Low level I/O - read and write, Open, create, close and unlink, Random an Listing Directory, Storage allocator.         Method: Debugging, Macro, User Defined Header, User Defined Library Func         Contemporary Issues         y Industry Experts or R&D organization         Total Lecture hours:         ernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Period	tion, makefi 2 hours 45 hours earson, June
Module:7 File Descripto Discussions on Programming utility. Module:8 Guest lecture by Text Book(s) 1. B. W. K. 2015. 2. Gary J F	Unix system Interface & Programmingmethods         r, Low level I/O - read and write, Open, create, close and unlink, Random a         n Listing Directory, Storage allocator.         Method: Debugging, Macro, User Defined Header, User Defined Library Func         Contemporary Issues         y Industry Experts or R&D organization         Total Lecture hours:         ernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Peterson, "ANSI C Programming", Fourth Edition, Cengage Learning India Priva	tion, makefi 2 hours 45 hours earson, June
Module:7 File Descripto Discussions of Programming utility. Module:8 Guest lecture by Text Book(s) 1. B. W. K. 2015. 2. Gary J E Fourth e	Unix system Interface & Programmingmethods         r, Low level I/O - read and write, Open, create, close and unlink, Random a         n Listing Directory, Storage allocator.         Method: Debugging, Macro, User Defined Header, User Defined Library Func         Contemporary Issues         y Industry Experts or R&D organization         Total Lecture hours:         ernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Peters         Bronson, "ANSI C Programming", Fourth Edition, Cengage Learning India Privaction, 2016.	tion, makefr 2 hours 45 hours earson, June ate Limited
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Module:7 File Descripto Discussions of Programming utility. Module:8 Guest lecture by Text Book(s) 1. B. W. K. 2015. 2. Gary J F. Fourth e 3. B. Gott Publishe	Unix system Interface & Programmingmethods         r, Low level I/O - read and write, Open, create, close and unlink, Random a         n Listing Directory, Storage allocator.         Method: Debugging, Macro, User Defined Header, User Defined Library Func         Contemporary Issues         y Industry Experts or R&D organization         Total Lecture hours:         ernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Petersidition, 2016.         Fried, "Programming in C", Second Edition, Schaum Outline Series, Tata Metrs, 1996.	tion, makefr 2 hours 45 hours earson, June ate Limited
Module:7 File Descripto Discussions on Programming utility. Module:8 Guest lecture by Text Book(s) 1. B. W. K. 2015. 2. Gary J E Fourth e 3. B. Gott Publishe Reference Bo	Unix system Interface & Programmingmethods         rr, Low level I/O - read and write, Open, create, close and unlink, Random a         n Listing Directory, Storage allocator.         Method: Debugging, Macro, User Defined Header, User Defined Library Func         Contemporary Issues         y Industry Experts or R&D organization         Total Lecture hours:         ernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Petrition, 2016.         Bronson, "ANSI C Programming", Fourth Edition, Cengage Learning India Privatedition, 2016.         fried, "Programming in C", Second Edition, Schaum Outline Series, Tata Metros, 1996.         ooks	tion, makefr 2 hours 45 hours earson, June ate Limited
Module:7 File Descripto Discussions of Programming utility. Module:8 Guest lecture by Text Book(s) 1. B. W. K. 2015. 2. Gary J E Fourth c 3. B. Gott Publishe Reference Bo 1. Herbert	Unix system Interface & Programmingmethods         r, Low level I/O - read and write, Open, create, close and unlink, Random a         n Listing Directory, Storage allocator.         Method: Debugging, Macro, User Defined Header, User Defined Library Func         Contemporary Issues         y Industry Experts or R&D organization         Total Lecture hours:         ernighan and D. M. Ritchi, "The C Programming Language", Second Edition, Petersidition, 2016.         Fried, "Programming in C", Second Edition, Schaum Outline Series, Tata Metrs, 1996.	tion, makefi 2 hours 45 hours earson, June ate Limited

### Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar





List o	of Challenging Experiments (Indicative)	)					
1.	Algorithm and flowcharts of small problem	ns like GCD					
2.	Small but tricky codes (use of operators and expressions)						
3.	Solving sequences (applications of control	structures)					
4.	Proper parameter passing (User defined fur	nctions)					
5.	Command line Arguments (Understanding	; main( ))					
6.	Variable parameter (Pointers and Arrays)						
7.	Pointer to functions (Pointer and functions	5)					
8.	User defined header (Creation of headers)						
9.	Make file utility (unix make file)						
10.	Multi file program and user defined librarie	es (Use of pre-proc	essor direc	ctives)			
11.	Interesting substring matching / searching	programs (String 1	natching a	ndsearching)			
			Total La	aboratory Hours	30 hours		
Mo	Mode of Assessment: Assessments/ Mid Term Lab/ FAT / Project						
Rec	ommended by Board of Studies	07-06-2019					
App	roved by Academic Council	No. 55	Date	13-06-2019			



### VIIT<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

### CURRICULUM (2022 - 2023)

Course code		Course title L		P	J	C 2
ENG1013		Business Communication & Value Science – I 1	0	2	0	
Pre-requisite	1	Basic Knowledge of high school English	•		versi	OI
Carries Obie ati-				v. 1.(	)	
Course Objective		cepts of life skills and its importance				
		b look within and create a better version of self.				
3. To introduce the	iem to F	ey concepts of values, life skills and business communication				
Expected Course	e Outco	ome.				
		or life skills and values.				
		with basics of pronunciation				
-		hs and opportunities				
8	0	to different situations				
0		tenets of communication				
-		inication practices in different types of communication.				
o. rippiy the basic	comm	meadon practices in enforcent types of communication.				
Module:1	Elem	entary Grammar & Vocabulary Enrichment			2 ho	ur
Understanding ba		ummar-Parts of Speech; reading newspapers for vocabular	y de	velor	men	t.
0	-	Common mistakes in everyday conversation.	5	1		
0		,,, _,, _				
16 1 1 0						
Module:2	Phon	ics in English			2 ho	urs
		<b>ics in English</b> onsonants – Minimal Pairs- Consonant Clusters- Past Tense I	Marko			
	and C	onsonants – Minimal Pairs- Consonant Clusters- Past Tense	Marko			
Sounds – Vowels Marker.Activity: W	and C Vorkshe	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I ets, Exercises	Marko	er an	d Plu	ıra
Sounds – Vowels Marker.Activity: W Module:3	and C Vorkshe	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I ets, Exercises munication Skills		er an	d Ph 2 ho	ura
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com	and C Vorkshe Com	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I ets, Exercises munication Skills ation Skills Barriers of communication, Types of communication		er an	d Ph 2 ho	ura urs
Sounds – Vowels Marker.Activity: W Module:3	and C Vorkshe Com	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I ets, Exercises munication Skills ation Skills Barriers of communication, Types of communication		er an	d Ph 2 ho	ura urs
Sounds – Vowels Marker.Activity: W Module:3 Overview of Con Non-verbal &Effe	and C Vorkshe Com nmunic ective co	nonsonants – Minimal Pairs- Consonant Clusters- Past Tense I ets, Exercises munication Skills ation Skills Barriers of communication, Types of communication mmunication.		er an - Vei	d Plu 2 ho :bal <i>a</i>	ura urs
Sounds – Vowels Marker.Activity: W Module:3 Overview of Con Non-verbal &Effe Module:4	and C Vorkshe <b>Com</b> nmunic ective co <b>Intro</b>	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I ets, Exercises munication Skills ation Skills Barriers of communication, Types of communication ommunication.	ation	er an - Vei	d Plu 2 ho :bal <i>i</i> 2 ho	urs urs unc
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress managemen	and C Vorkshe Com nmunic ective co Intro	nonsonants – Minimal Pairs- Consonant Clusters- Past Tense Tets, Exercises munication Skills ation Skills Barriers of communication, Types of communication ommunication. duction to Life Skills king with rhythm and balance, teamwork - Pursuit of Happin	ation	er an - Vei	d Plu 2 ho :bal <i>i</i> 2 ho	urs urs
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress managemen	and C Vorkshe Com nmunic ective co Intro	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I ets, Exercises munication Skills ation Skills Barriers of communication, Types of communication ommunication.	ation	er an - Vei	d Plu 2 ho :bal <i>i</i> 2 ho	urs urs unc
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress managemen	and C Vorkshe Com mmunic ective co Intro nt, worl ou can i	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I eets, Exercises munication Skills ation Skills Barriers of communication, Types of communication ommunication. duction to Life Skills king with rhythm and balance, teamwork - Pursuit of Happin dentify, what can you relate to?	ation	er an - Ver What	d Plu 2 hor bal a 2 hor are	urs unc urs the
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress managemen skills and values yo Module:5	and C Vorkshe Communic ective co Intro nt, worl ou can i	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I ets, Exercises munication Skills ation Skills Barriers of communication, Types of communication mmunication. duction to Life Skills king with rhythm and balance, teamwork - Pursuit of Happin dentify, what can you relate to?	ation-	er an - Ver What	d Plu 2 hor bal a 2 hor are 2 hor	ura urs unc urs the
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress managemen skills and values yo Module:5 Impromptu, Imp	and C Vorkshe Com nmunic ective co Intro nt, worl ou can i Art o portanc	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I eets, Exercises           munication Skills           ation Skills Barriers of communication, Types of communication           duction to Life Skills           king with rhythm and balance, teamwork - Pursuit of Happin           dentify, what can you relate to?           f Public Speaking           e of Non-verbal Communication, Technical Talks, Dynamic	ation-	er an - Ver What	d Plu 2 hor bal a 2 hor are 2 hor	ura urs unc urs the
Sounds – Vowels Marker.Activity: W Module:3 Overview of Con Non-verbal &Effe Module:4 Stress managemen skills and values yo Module:5	and C Vorkshe Com nmunic ective co Intro nt, worl ou can i Art o portanc	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I eets, Exercises           munication Skills           ation Skills Barriers of communication, Types of communication           duction to Life Skills           king with rhythm and balance, teamwork - Pursuit of Happin           dentify, what can you relate to?           f Public Speaking           e of Non-verbal Communication, Technical Talks, Dynamic	ation-	er an - Ver What	d Plu 2 hor bal a 2 hor are 2 hor	urs urs urs urs
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress managemen skills and values yo Module:5 Impromptu, Imp	and C Vorkshe Communic ective co Intro nt, worl ou can i Art o portanc	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I eets, Exercises           munication Skills           ation Skills Barriers of communication, Types of communication           duction to Life Skills           king with rhythm and balance, teamwork - Pursuit of Happin           dentify, what can you relate to?           f Public Speaking           e of Non-verbal Communication, Technical Talks, Dynamic	ation-	er an - Ver What Prof	d Plu 2 hor bal a 2 hor are 2 hor	urs urs urs urs urs
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress management skills and values yout Module:5 Impromptu, Imp Presentations – In Module:6	and C Vorkshe Communic ective co Intro nt, work ou can i Ou can i Portanc ndividu	onsonants – Minimal Pairs- Consonant Clusters- Past Tense I eets, Exercises           munication Skills           ation Skills Barriers of communication, Types of communication           duction to Life Skills           king with rhythm and balance, teamwork - Pursuit of Happin           dentify, what can you relate to?           f Public Speaking           e of Non-verbal Communication, Technical Talks, Dynamic	ation-	er an - Ver What Prof	d Plu 2 hor bal a 2 hor are 2 hor fessio	urs urs urs urs urs
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress managemen skills and values yo Module:5 Impromptu, Imp Presentations – In Module:6 Summary writing, s	and C Vorkshe Communic ective co Intro nt, work ou can i ou can i Art or portance individu	<ul> <li>Minimal Pairs- Consonant Clusters- Past Tense I eets, Exercises</li> <li>munication Skills</li> <li>ation Skills Barriers of communication, Types of communication</li> <li>duction to Life Skills</li> <li>king with rhythm and balance, teamwork - Pursuit of Happin dentify, what can you relate to?</li> <li>f Public Speaking</li> <li>e of Non-verbal Communication, Technical Talks, Dynamic al &amp; Group</li> <li>ng Skill</li> <li>riting and creating a Podcast</li> </ul>	ation-	- Ver What	d Plu 2 hor bal a 2 hor cessio 2 hor	urs urs urs the urs na
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress management skills and values you Module:5 Impromptu, Imp Presentations – In Module:6 Summary writing, S	and C Vorkshe Communic ective co Intro nt, worl ou can i Art or portanc ndividu Story w	munication Skills ation Skills Barriers of communication, Types of communication Skills Barriers of communication, Types of communication. duction to Life Skills king with rhythm and balance, teamwork - Pursuit of Happin dentify, what can you relate to? f Public Speaking e of Non-verbal Communication, Technical Talks, Dynamic al & Group ng Skill riting and creating a Podcast espondence and Career Development	ation- ess. '	er an - Ver What Prof	d Plu 2 hor bal a 2 hor are 2 hor 5 cessio 2 hor 3 hor	urs urs unc urs unc urs urs urs
Sounds – Vowels Marker.Activity: W Module:3 Overview of Com Non-verbal &Effe Module:4 Stress managemen skills and values yo Module:5 Impromptu, Imp Presentations – In Module:6 Summary writing, s Module:7 Letter-Formal, Em	and C Vorkshe Communic ective co Intro nt, worl ou can i ou can i Art of portanc individu Writi story w Corre nail &A	<ul> <li>Minimal Pairs- Consonant Clusters- Past Tense I eets, Exercises</li> <li>munication Skills</li> <li>ation Skills Barriers of communication, Types of communication</li> <li>duction to Life Skills</li> <li>king with rhythm and balance, teamwork - Pursuit of Happin dentify, what can you relate to?</li> <li>f Public Speaking</li> <li>e of Non-verbal Communication, Technical Talks, Dynamic al &amp; Group</li> <li>ng Skill</li> <li>riting and creating a Podcast</li> </ul>	ation- ation- cess. V	- Ver What Prof	d Plu 2 hor bal a 2 hor are 2 hor cessio 2 hor Resu	urs unc urs the urs urs urs urs





Mod	lule: 8	Contemporary Issues				2 hours
Gues	st lecture by	Industry Experts or R&D org	anization			
				Tota	l Lecture hours:	15 hours
Lab	Experimen	its:				
1	Listening:	Casual and Academic				
2	1 0	Socializing Skills - Introducing			k SWOT	
3	Group Dis	cussion: Factual, controversial	and abstract issu	ies		
4		on skill: JAM, Narrating a story	/anecdote			
5	Writing: T					
6	Public Spe	aking: Extempore /Monologu	es			
7	Roleplay: U	Understanding Inter and Cross	-Cultural Commu	unication N	luances	
8		Community service-work with				
9		Famous Personalities motivation			rities	
10	Soft skills -	- Mock Job/Placement Intervi	ews/ Video Resu			
				Total La	aboratory hours:	30 hours
Text	t Book(s)				·	
1.	Kumar.Sar	njay & Pushplata, Communicat	ion Skills, 2 <sup>nd</sup> Ed	ition, OUP	, 2015	
2.	Koneru, A	runaProfessional Speaking Ski	lls, OUP, 2015.			
Refe	rence Bool	\$				
1.	Mc'carthy,	Michael &O'dell,Felicity, Engl	ish Vocabulary in	n use,CUP,2	2010	
2.	SarojHiren	nath, Saroj, Business communi	cation, NiraliPral	kashan, 201	8.	
Mod	le of Evalua	ation: CAT / Assignment /	Quiz / FAT			
Reco	ommended	by Board of Studies	07-06-2019			
App	roved by A	cademic Council	No. 55	Date	13-06-2019	



### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

### CURRICULUM (2022 - 2023)

Course code	Course title	L	Τ	Р	J	С
ENG1014	Business Communication & Value Science – II	1	0	2	0	2
Pre-requisite		Sy	yllab	us ve	ersio	n
			V	v <b>. 1.0</b>		
<b>Course Objectiv</b>	res:					
1. To develop effe	ective writing, reading, presentation and group discussion skills.					
2. To help studen	ts identify personality traits and evolve as a better team player.					
3. To introduce the	hem to key concepts of morality, behaviour & beliefs and diversity &	incl	usion	1		
Expected Cours	e Outcome:					
-	onic/social media to share concepts and ideas					
2. Acquire technic	-					
1	t tools for quick reading.					
	e basic concepts of Morality and Diversity					
	ions on a topic with the objective of influencing others					
	he basics of presentation and effective writing skills					
	1 0					
Module:1	Public Speaking and Presentation Skills				3 ho	1115
1 0	in Hands Movement'. Individual identification of social issues - Eac cial issue which they would like to address - Common errors, punctua					ses
one particular soc often confused.	cial issue which they would like to address - Common errors, punctua			es and	d wo	ses rds
one particular soc often confused. Module:2	cial issue which they would like to address - Common errors, punctua	ation	n rule	es and	d wo <b>3 ho</b>	ses rds urs
one particular soc often confused. Module:2 Encourage the st	cial issue which they would like to address - Common errors, punctua	atior d Jo	anie	es and	d wo <b>3 ho</b> Aaho	ses rds urs
one particular soc often confused. Module:2 Encourage the su writing technique	Lucid Writing tudents to go through the links given about Catherine Morris and	atior d Jo	n rule	es and McN ne sar	d wo <b>3 ho</b> Aaho	ses rds urs
one particular soc often confused. Module:2 Encourage the su writing technique Module:3	Lucid Writing tudents to go through the links given about Catherine Morris and s - Speed Reading session: Introduction to skimming and scanning; p Communication Skills	atior d Jo practi	a rule	es and McN ne sar	d wo <b>3 ho</b> Maho ne. <b>3 ho</b>	rds rds urs on's
one particular soc often confused. Module:2 Encourage the st writing technique Module:3 Team work and h	Lucid Writing         tudents to go through the links given about Catherine Morris and         s - Speed Reading session: Introduction to skimming and scanning; p         Communication Skills         now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big	atior d Jo practi	a rule	es and McN ne sar	d wo <b>3 ho</b> Maho ne. <b>3 ho</b>	rds rds urs on's
one particular soc often confused. Module:2 Encourage the su writing technique Module:3	Lucid Writing         tudents to go through the links given about Catherine Morris and         s - Speed Reading session: Introduction to skimming and scanning; p         Communication Skills         now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big	atior d Jo practi	a rule	es and McM ne sar	d wo <b>3 hou</b> Maho ne. <b>3 hou</b> trait	urs urs on's s -
one particular soc often confused. Module:2 Encourage the su writing technique Module:3 Team work and h Belbin's 8 team pl Module:4	Lucid Writing tudents to go through the links given about Catherine Morris and s - Speed Reading session: Introduction to skimming and scanning; p Communication Skills now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big layer styles	atior d Jo practi	a rule	es and McM ne sar	d wo <b>3 ho</b> Maho ne. <b>3 ho</b>	urs
one particular soc often confused. Module:2 Encourage the st writing technique Module:3 Team work and h Belbin's 8 team pl Module:4 Reviewing a book	cial issue which they would like to address - Common errors, punctual          Lucid Writing         tudents to go through the links given about Catherine Morris and solver a solver speed Reading session: Introduction to skimming and scanning; p         Communication Skills         now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big layer styles         Soft Skills         x, a video, a film -Values and Life Skills: TCS values	atior d Jo practi	a rule	McN Me sar	d wo <b>3 ho</b> Maho ne. <b>3 ho</b> trait	urs urs on's urs s -
one particular soc often confused. Module:2 Encourage the su writing technique Module:3 Team work and h Belbin's 8 team pl Module:4 Reviewing a book Module:5	cial issue which they would like to address - Common errors, punctual         Lucid Writing         tudents to go through the links given about Catherine Morris and s - Speed Reading session: Introduction to skimming and scanning; p         Communication Skills         now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big         layer styles         Soft Skills         x, a video, a film -Values and Life Skills: TCS values         Data Interpretation	atior d Jo practi	a rule	McN Me sar	d wo <b>3 hou</b> Maho ne. <b>3 hou</b> trait	urs urs on's urs s -
one particular soc often confused. Module:2 Encourage the su writing technique Module:3 Team work and h Belbin's 8 team pl Module:4 Reviewing a book Module:5	cial issue which they would like to address - Common errors, punctual          Lucid Writing         tudents to go through the links given about Catherine Morris and solver a solver speed Reading session: Introduction to skimming and scanning; p         Communication Skills         now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big layer styles         Soft Skills         x, a video, a film -Values and Life Skills: TCS values	atior d Jo practi	a rule	McN Me sar	d wo <b>3 ho</b> Maho ne. <b>3 ho</b> trait	urs urs urs s -
one particular soc often confused. Module:2 Encourage the si writing technique Module:3 Team work and h Belbin's 8 team pl Module:4 Reviewing a book Module:5 Interpretation of Module: 6	Lucid Writing tudents to go through the links given about Catherine Morris and s - Speed Reading session: Introduction to skimming and scanning; p Communication Skills now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big layer styles Soft Skills x, a video, a film -Values and Life Skills: TCS values Data Interpretation f Data & Transcoding Contemporary Issues	atior d Jo practi	a rule	McN Me sar	d wo <b>3 ho</b> Maho ne. <b>3 ho</b> trait	urs
one particular soc often confused. Module:2 Encourage the si writing technique Module:3 Team work and h Belbin's 8 team pl Module:4 Reviewing a book Module:5 Interpretation of Module: 6	Lucid Writing tudents to go through the links given about Catherine Morris and s - Speed Reading session: Introduction to skimming and scanning; p Communication Skills now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big layer styles Soft Skills x, a video, a film -Values and Life Skills: TCS values Data Interpretation f Data & Transcoding Contemporary Issues Industry Experts or R&D organization	atior d Jo practi	anie ice the ersor	es and McMe sar	d wo <b>3 ho</b> <i>f</i> <i>f</i> <b>3 ho</b> <b>3 ho</b> <b>2 ho</b> <b>2 ho</b> <b>1 ho</b>	urs on's urs s - urs urs
one particular soc often confused. Module:2 Encourage the si writing technique Module:3 Team work and h Belbin's 8 team pl Module:4 Reviewing a book Module:5 Interpretation of Module: 6 Guest lecture by	Lucid Writing tudents to go through the links given about Catherine Morris and s - Speed Reading session: Introduction to skimming and scanning; p Communication Skills now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big layer styles Soft Skills c, a video, a film -Values and Life Skills: TCS values Data Interpretation f Data & Transcoding Contemporary Issues Industry Experts or R&D organization Total Lecture F	atior d Jo practi	anie ice the ersor	es and McMe sar	d wo <b>3 ho</b> <i>M</i> aho ne. <b>3 ho</b> <b>5 ho</b> <b>2 ho</b>	urs urs on's urs urs urs
one particular soc often confused. Module:2 Encourage the st writing technique Module:3 Team work and h Belbin's 8 team pl Module:4 Reviewing a book Module:5 Interpretation of Module: 6 Guest lecture by List of Challeng	Lucid Writing tudents to go through the links given about Catherine Morris and s - Speed Reading session: Introduction to skimming and scanning; p Communication Skills now individuals contribute- Belbin's 8 Team Roles and Lindgren's Big layer styles Soft Skills x, a video, a film -Values and Life Skills: TCS values Data Interpretation f Data & Transcoding Contemporary Issues Industry Experts or R&D organization	atior d Jo practi	anie ice the ersor	es and McMe sar	d wo <b>3 ho</b> <i>f</i> <i>f</i> <b>3 ho</b> <b>3 ho</b> <b>2 ho</b> <b>2 ho</b> <b>1 ho</b>	urs on's urs s - urs urs





	-				
3	Design a logo: Creating Vision, Mission,	Value statement, t	agline		
4	Soft skills: Role playson social issues				
5	Soft Skills : Discussion on social issues				
6	Presentation skills: Understanding divers	ity: PPT presentati	ons		
7	Report Writing: Role of NGO: a visit to	the sight for a han	ds-on expe	rience and submit a	report
8	Resume: Video resume				
			Tota	al Lecture hours:	30 hours
Te	xt Book(s)			·	
1.	Raman, Meenakshi& Sangeeta Sharma. T	echnical Commun	ication: Pr	inciples and Practice	, 3rd edition,
	Oxford University Press, 2015.				
Re	ference Books				
1.	Kalam, A.A. (2015). Guiding Souls: Diale	ogues on the purpo	ose of Life.	PrabhatPrakashan	
2.	Alred, G. J., Brusaw, C. T., &Oliu, W. E.	(2011). Handbook	x of Techn	ical Writing, Tenth E	dition (10th
	ed.). St. Martin's Press				
3	Sherman, Barbara.(2014).Skimming and S	Scanning Techniqu	es.Liberty	University Press.	
Mo	ode of Evaluation: CAT / Assignment /	/ Quiz / FAT			
р.	commended by Board of Studies	07-06-2019			
ке	commended by Doard of Studies	01 00 2017			



Course code	Course title	L '	Г	P J	C
ENG 1017	Business Communication & Value Science – III	1 (	0	2 0	2
Pre-requisite	NIL	Syl	labu	is ver	sior
			v.	1.0	
Course Objective	es:				
1. To develop tech	nnical writing skills				
	earners with Self-analysis techniques like SWOT & TOWS				
3. To introduce s	tudents to key concepts of Pluralism & cultural spaces, Cross-cultu	iral Co	omn	nunica	tior
and Science of Na	tion building.				
	2				
Expected Course					
	principles of SWOT & life positions.				
	sentences by exposure to grammatical rules				
	concepts of Global, glocal and trans locational				
	ognize the importance of Artificial Intelligence				
=	ls of technical writing				
6. Exhibit underst	anding of diversity and cross-cultural communication				
Module:1	SWOT Vs. TOWS			2 h	oure
The Balancing Ac	t (Self Analysis) - Basic principles of SWOT & life positions. Ted talk	s on b	iomi	micrv	
0				5	
Module:2	English Grammar & Vocabulary			2 ho	oure
Error Detection,	Voice (Active & passive) Text Completion (Closed/ open)				
`					
Module:3	Pluralism in cultural spaces			2 ho	ours
Awareness and re	espect for pluralism in cultural spaces Theory/Discussion using P	hir M	iley	Sur N	Aera
Tumhara					
	1				
Module:4	Global, Glocal and translocational cross-cultural communicat			2 ho	ours
2	nmon mistakes made in cross-cultural communication. Verb	al an	d r	ion-ve	erbal
communication (a	pproach is through Ted and YouTube videos).				
Module:5	Technical Writing			2 ho	ours
	-Basic rules of Report writing through examples			- 110	
	posal - "How will a voice assistant evolve in 25 years from now?"				
~, · · · · · · · · · · · · · · · · · · ·					
Module:6	Motivation			2 ho	ours
Maslow's theory -	Recognize how motivation helps real life - Leverage motivation in re	al-life	scer	arios	
Module:7	Role of Science in nation building			2 he	ours
L	0	I			





		Role of science in nation b	uilding- Discussion	n through A	ugmented Reality, R	ole of science
post	- independer	nce				
Mod	lule:8	Contemporary Issues				1 hou
		Industry Experts or R&D	organization			1 1104
Oue	st lecture by		organization	Tota	l Lecture hours:	15 hour
Lab	Experimer	nts				
1		Applying SWOT in real life	e scenarios/Create	your SWO	Г	
2	1 0	Skit -Global/Glocal/Tran		,		
3		Motivational Talk				
4	_	mportance of Artificial Inte	elligence. / Practic	al technolog	gy	
5	-	Summarizing - activity on	-			heory
6	Speaking -	-Cross Cultural Communica	ation: PPT present	ations		
7		scussion - the role of scient			ancient India.	
8	-	Vriting (Poster Presentation				
			, ,	To	otal Laboratory hou	rs: 30 hours
Tex	t Book(s)				-	
1.		njay and Pushp Lata. Engl	ish Language and	Communic	ation Skills for Engin	eers, Oxford
	University	Press, India, 2018.				
Refe	erence Bool	٢S				
1.	0 .	S., & O'Keefe, S. S. (2009	,	0		Planning and
	Writing Te	echnical Content (3rd ed.). S	Scriptorium Publis	hing Servic	es, Inc.	
2.	Alred, G.	J., Brusaw, C. T., &Oliu, '	W. E. (2011). Har	ndbook of	Technical Writing, T	enth Edition
	、 ,	St. Martin's Press.				
3.		S., Valentine, D., &Munter	· ,			nications (2nd
	, ,	Guide to Series in Business	,	,		
4.		& Tomalin, B. (2016). Cro	oss-Cultural Comm	unication: '	Theory and Practice	(1st ed. 2013
	, 0	ave Macmillan.				
	Reference					
1	1	of Technical Writing for St				
		eelance-writing.lovetoknow	.com/kinds-techni	cal-writing		
2		f a Good Technical Writer				. ,
	-	ckhelp.com/clickhelp-tech	0 0		-a-good-technical-wr	iter/
3		s and challenges of cultural	•	-	/	
<u> </u>	-	ww.hult.edu/blog/benefits-	-challenges-cultura	l-diversity-v	vorkplace/	
	ine Resourc					
1	1 ,	utu.be/CsaTslhSDI				
2	-	.youtube.com/watch?featur	•			
3	https://m	.youtube.com/watch?v=dT	_D68RJ5T8&feat	ure=youtu.l	be	
Mod	le of Evalua	ation: CAT / Assignment /	/ Quiz / FAT			
Rec	ommended	by Board of Studies	29-01-2021			
App	roved by A	cademic Council	No. 61	Date	18-02-2021	



### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Course Code	Course Title	L	Τ	Р	J	С
ENG1018	Business Communication and Value Science - IV	1	0	2	0	2
Pre-requisite	NIL		Sylla	bus	vers	ion
				<b>v.</b> 1	.0	
<b>Course Objectives</b>	;;					
1. To recognize the	e best practices of communicative writing					
2. To understand the	ne importance of emotional intelligence and diversity in personal ar	nd p	orofe	sion	al liv	ves
3. To acquaint the	learners on corporate etiquettes & corporate social responsibility					
Expected Course	Outcome:					
4. Excel in commu	nicative writing in real life scenarios.					
5. Recognize the in	nportance of corporate social responsibility (CSR)					
6. Assess the impac	ct of conflicts and list the basic guidelines required to manage confl	licts				
7. Relate to Emotio	onal Intelligence in personal and professional life.					
8. Identify the best	time management practices and apply in diverse situations					
9. Demonstrate ad	vanced level communication skills					
-						
Module:1	Communicative Writing				2	hou
	municative Writing, Formal and Business letters, Writing SOP					
Principles of Com						
Principles of Con						
Module:2	Corporate Social Responsibility (CSR)				2	houi
Module:2		requ	ired	for v		
Module:2 Ubuntu story – A	Corporate Social Responsibility (CSR)	-			vork	and
<b>Module:2</b> Ubuntu story – A life Qualities of a	<b>Corporate Social Responsibility (CSR)</b> story to introduce the concept of social responsibility. Attributes r	-			vork	and
Module:2 Ubuntu story – A life Qualities of a	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi	-			vork	and
<b>Module:2</b> Ubuntu story – A life Qualities of a	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi	-			vork nnin	and g d)
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3	<b>Corporate Social Responsibility (CSR)</b> story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic this e) Resolving conflicts	inki	ng &	z pla	vork nnin <b>2</b> 1	anc g d) hou
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts	inki	ng &	z pla	vork nnin <b>2</b> 1	and g d) hou
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3 Meaning and defin	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts ition of conflict; reasons for conflict; negative and positive impact	inki	ng &	z pla	vork nnin <b>2</b> 1	anc g d) hou
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3 Meaning and defin	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts	inki	ng &	z pla	vork nnin 2 , Tip	and g d) hou
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3 Meaning and defin manage conflict Module:4 Business idioms ar	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts hition of conflict; reasons for conflict; negative and positive impace Business Communication ad corporate terms - handouts of common business idioms and gui	ct o	ng &	r pla	vork nnin 21 , Tip 21	and g d) hou bs to
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3 Meaning and defin manage conflict Module:4 Business idioms ar	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic this e) Resolving conflicts Understanding conflicts hition of conflict; reasons for conflict; negative and positive impact Business Communication	ct o	ng &	r pla	vork nnin 21 , Tip 21	and g d) hou bs to
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3 Meaning and defin manage conflict Module:4 Business idioms an the TCS BizVocab	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts hition of conflict; reasons for conflict; negative and positive impace Business Communication ad corporate terms - handouts of common business idioms and gui on their smartphones.	ct o	ng &	r pla	vork nnin 21 21 21 22 00wn	and g d) hou os to hou
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3 Meaning and define manage conflict Module:4 Business idioms are the TCS BizVocab Module:5	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts ition of conflict; reasons for conflict; negative and positive impace Business Communication ad corporate terms - handouts of common business idioms and gui on their smartphones. Time management	inki ct o de t	ng &	r pla	vork nnin 21 21 21 22 00wn	and g d) hours bs to hours load
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3 Meaning and define manage conflict Module:4 Business idioms are the TCS BizVocab Module:5	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts hition of conflict; reasons for conflict; negative and positive impace Business Communication ad corporate terms - handouts of common business idioms and gui on their smartphones.	inki ct o de t	ng &	r pla	vork nnin 21 21 21 22 00wn	and g d) hou os to hou
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3 Meaning and define manage conflict Module:4 Business idioms are the TCS BizVocab Module:5	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts ition of conflict; reasons for conflict; negative and positive impace Business Communication ad corporate terms - handouts of common business idioms and gui on their smartphones. Time management	inki ct o de t	ng &	r pla	vork nnin 21 21 21 22 00wn	anci g d) hou os to hou load
Module:2 Ubuntu story – A life Qualities of a Decision making, o Module:3 Meaning and defin manage conflict Module:4 Business idioms an the TCS BizVocab Module:5	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts ition of conflict; reasons for conflict; negative and positive impace Business Communication ad corporate terms - handouts of common business idioms and gui on their smartphones. Time management	inki ct o de t	ng &	r pla	vork nnin 21 2, Tip 21 own 21	anci g d) hou os to hou load
Module:2         Ubuntu story – A         life Qualities of a         Decision making, o         Module:3         Meaning and define         manage conflict         Module:4         Business idioms are         the TCS BizVocab         Module:5         Basic concepts of formation         Module:6	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic this e) Resolving conflicts Understanding conflicts ition of conflict; reasons for conflict; negative and positive impace Business Communication ed corporate terms - handouts of common business idioms and gui on their smartphones. Time management Fime Management Importance of Time Management for Better Lite	inki ct o de t	ng &	to d	vork nnin 21 2, Tip 21 own 21 21	and g d) hou os to load
Module:2         Ubuntu story – A         life Qualities of a         Decision making, or         Module:3         Meaning and define         manage conflict         Module:4         Business idioms are         the TCS BizVocab         Module:5         Basic concepts of a         Module:6         Importance of Etic	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts ition of conflict; reasons for conflict; negative and positive impace Business Communication ad corporate terms - handouts of common business idioms and gui on their smartphones. Time management Fime Management Importance of Time Management for Better Life Corporate Etiquette & Communication	inki ct o de t	ng &	to d	vork nnin 21 2, Tip 21 own 21 21	and g d) hour bos to load
Module:2         Ubuntu story – A         life Qualities of a         Decision making, or         Module:3         Meaning and define         manage conflict         Module:4         Business idioms are         the TCS BizVocab         Module:5         Basic concepts of a         Module:6         Importance of Etic	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts ition of conflict; reasons for conflict; negative and positive impace Business Communication ad corporate terms - handouts of common business idioms and gui on their smartphones. Time management Fime Management Importance of Time Management for Better Life Corporate Etiquette & Communication quette in business and everyday life, Components of Etiquette –Ne	inki ct o de t	ng &	to d	vork nnin 21 2, Tip 21 own 21 21	and g d) hou os to load
Module:2         Ubuntu story – A         life Qualities of a         Decision making, or         Module:3         Meaning and define         manage conflict         Module:4         Business idioms are         the TCS BizVocab         Module:5         Basic concepts of a         Module:6         Importance of Etic	Corporate Social Responsibility (CSR) story to introduce the concept of social responsibility. Attributes r good team member: a) Resilience, b) Flexibility, c) Strategic thi e) Resolving conflicts Understanding conflicts ition of conflict; reasons for conflict; negative and positive impace Business Communication ad corporate terms - handouts of common business idioms and gui on their smartphones. Time management Fime Management Importance of Time Management for Better Life Corporate Etiquette & Communication quette in business and everyday life, Components of Etiquette –Ne	inki ct o de t	ng &	to d	vork nnin 21 21 21 own 21 21 stand	and g d) hour bos to load





Moo	dule 8 Contemporary Issues				1 hour
Guest	lecture by Industry Experts or R&D organiz	zation			
			Tota	ll Lecture hours:	15 hours
Lab	Experiments:			L	
1	Listening - CSR story & CSR activity of	Tata Steel, N	licrosoft,	Google, TCS, Starbucks	, Titan, Tata
	Chemicals and TOMS Shoes			0 / /	
2	Speaking - Public speaking at work place	e and best pra	actices of	public speaking/ Preser	nting a selected
	speech by an eminent leader.	1			0
3	Reading- Cloze test on corporate etique	tes			
4	Communicative writing- drafting busine		ganizing w	ork place events throug	gh mails
5	Listening - Case studies of Conflict reso				
	advantages and challenges				
6	Speaking - Conflict management- Preser	ntation skills	/ Effectiv	e time management- ex	tempore/
	presenting a pitch				
7	Reading & summarizing - Time manager				-
8	Narrative Writing - Who am I? (Image N	0	0	a perfect image) / Explo	oring Self-
	awareness and social awareness through	Narrative es	say		20.1
				Total Laboratory h	ours:30 hours
Text	Book(s)				
1.	Raman, Meenakshi & Sangeeta Sharm edition, Oxford University Press, 2015.	a. Technical	Commun	nication: Principles and	Practice, 3rd
Refer	ence Books				
1.	Carnegie, D. (2017). How to Develop (Reissue ed.). Gallery Books	Self-Confide	ence and i	Influence People by P	ublic Speaking
2.	C Muralikrishna & Sunitha Mishra(201	1). Commun	ication Sl	kills for Engineers, 2nd	d edition, NY:
	Pearson.				
3.	Frantisek, Burda(2015). On Transcultura	l Communic	ation, LA	P Lambert Academic Pu	ublishing, UK.
	References:				
1	https://www.tata.com/about-us/tata-gr	<u>+</u>	0	1 1 1 1 1 1	1 1
2	https://economictimes.indiatimes.com/	tata-success-	story-1s-ba	ised-on-humanity-philai	nthropy-and-
Onlin	ethics/articleshow/41766592.cms e Resources:				
1	https://youtu.be/reu8rzD6ZAE				
2	https://youtu.be/Wx9v_J34Fyo				
3	https://youtu.be/F2hc2FLOdhI				
4	https://youtu.be/wHGqp8lz36c				
5	https://youtu.be/hxS5He3KVEM				
		Quiz / FAT			
	mmended by Board of Studies	29-01-20	21		
	oved by Academic Council	No. 61	Date	18-02-2021	





Course Cod	le Course Title	L	Т	Р	I	С	
ENG1901	Technical English - I	0	0	4	0	2	
Pre-requisite	Foundation English-II		Syllabus Ver				
				v. 1.(	)		
Course Object	ives:						
1. To enhance real life situa	students' knowledge of grammar and vocabulary to read and w tions.	rite erro	or-fre	e lan	guag	ge in	
2. To make the	students' practice the most common areas of written and spoker	n comm	unica	ition	s skil	ls.	
3. To improve classroom.	students' communicative competency through listening and	speakin	g act	ivitie	es in	the	
Expected Cou	rse Outcome:						
1. Develop a be	etter understanding of advanced grammar rules and write gramm	atically	corre	ct sei	ntenc	ces.	
2. Acquire wide	e vocabulary and learn strategies for error-free communication.	2					
-	l language and improve speaking skills in academic and social con	ntexts.					
-	ening skills so as to understand complex business communication		a var	ietv (	of gle	obal	
	nts through proper pronunciation.			)	0		
-	ts, diagrams and improve both reading and writing skills which	would	help	them	n in t	hei	
-	well as professional career.		- 1				
Module:1	Advanced Grammar			4	hou	irs	
Articles, Tenses,	, Voice and Prepositions						
Activity: Worksl	neets on Impersonal Passive Voice, Exercises from the prescribe	d text					
Module:2	Vocabulary Building, I				4 ho	urs	
Idioms and Phra	ases, Homonyms, Homophones and Homographs						
Activity: Jigsaw	Puzzles; Vocabulary Activities through Web tools						
Module:3	Listening for Specific Purposes				4 ho	1#0	
					+ 110	urs	
0	es, short conversations, announcements, briefings and discussion ling; Interpretations	15					
Teuvity. Gap III							
Module:4	Speaking for Expression			6	hou	irs	
	eself and others, Making Requests & responses, Inviting	and Ac	centi				
Invitations	and outers, maning requests a responses, monthing		pu	6/ 1		31112	
	ntroductions; Role-Play; Skit.						
····	-,,,,						
Module:5	Reading for Information				4 ho	urs	
	assages, News Articles, Technical Papers and Short Stories					-	
0	g specific news paper articles; blogs						



### VIID<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Module:6	Writing Strategies	4 hours
Joining the sen	tences, word order, sequencing the ideas, introduction and conclusion	
Activity: Short	Paragraphs; Describing familiar events; story writing	
Module:7	Vocabulary Building II	4 hours
	nain specific vocabulary by describing Objects, Charts, Food, Sports and Emplo	
	ribing Objects, Charts, Food, Sports and Employment	yment.
Module:8	Listening for Daily Life	4 hours
Listening for st	atistical information, short extracts, Radio broadcasts and TV interviews	
Activity: Taking	g notes and Summarizing	
Module:9	Expressing Ideas and Opinions	6 hours
	versations, Interpretation of Visuals and describing products and processes.	1
1	Play (Telephonic); Describing Products and Processes	
Module: 10	Comprehensive Reading	4 hours
	rehension, making inferences, Reading Graphics, Note-making, and Critical Rea	
	nce Completion; Cloze Tests	0
Module: 11	Narration	4 hours
Writing narrativ	ve short story, Personal milestones, official letters and E-mails.	
Activity: Writin	g an E-mail; Improving vocabulary and writing skills.	
Module: 12	Pronunciation	4 hours
Speech Sounds	, Word Stress, Intonation, Various accents	
1	cing Pronunciation through web tools; Listening to various accents of English	
Module: 13	Editing	4 hours
Simple, Comple	ex & Compound Sentences, Direct & Indirect Speech, Correction of Errors, Pu	inctuations.
Activity: Practi	cing Grammar	
Module: 14	Short Story Analysis	4 hours
	" by Jhumpa Lahiri	
	ng and analyzing the theme of the short story.	
-	Total Lecture hours	60 hours
T. ( D. 1. / T	V/ 1 1 1	
Text Book / V		0
	.C.; Martin, H.; Prasada Rao, N.D.V. (1973–2010). High School English (	Jrammar 8
1	tion. New Delhi: Sultan Chand Publishers.	• Engineer
	Sanjay, Pushp Latha. (2018) English Language and Communication Skills fo aford University Press.	1 Engineers
I mara: O2		



# Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

### CURRICULUM (2022 - 2023)

Refe	erence Books					
1.	Guptha S C, (2012) Practical En	glish Grammar &	Composition, 1st Edition	n, India: Arihant		
	Publishers					
2.	Steven Brown, (2011) Dorolyn Smith, Active Listening 3, 3rd Edition, UK: Cambridge University					
	Press.					
3.	Liz Hamp-Lyons, Ben Heasley, (201	0) Study Writing, 2	nd Edition, UK: Cambridge	e University Press.		
4.	Kenneth Anderson, Joan Maclear Cambridge, University Press.	n, (2013) Tony I	Lynch, Study Speaking, 2	nd Edition, UK		
5.	Eric H. Glendinning, Beverly Hol University Press.	mstrom, (2012) St	udy Reading, 2nd Edition,	, UK: Cambridge		
6.	Michael Swan, (2017) Practical Eng University Press.	lish Usage (Practic	al English Usage), 4th edit	ion, UK: Oxford		
7.	Michael McCarthy, Felicity O'Dell Edition), UK: Cambridge University	, 0	Vocabulary in Use Advance	ced (South Asian		
8.	Michael Swan, Catherine Walter, ( Edition, UK: Oxford University Pre		glish Grammar Course Ad	vanced, Feb, 4th		
9.	Watkins, Peter. (2018) Teaching	and Developing l	Reading Skills: Cambridge	Handbooks for		
	Language teachers, UK: Cambridge	University Press.				
10.	(The Boundary by Jhumpa Lahiri) URL:					
	https://www.newyorker.com/maga	zine/2018/01/29/	the-boundary?intcid=inline	amp		
List	le of evaluation: Quizzes, Presentat of Challenging Experiments (Indic		Role play, Assignments an			
1.	Self-Introduction			12 hours		
2.	Sequencing Ideas and Writing a Para	e 1		12 hours		
3.	Reading and Analyzing Technical Ar			8 hours		
4.	Listening for Specificity in Interview	· · · · · · · · · · · · · · · · · · ·	)	12 hours		
5.	Identifying Errors in a Sentence or P			8 hours		
6.	Writing an E-mail by narrating life ev			8 hours		
		Tot	al Laboratory Hours	60 hours		
	le of evaluation: Quizzes, Presentat		Role play, Assignments an	nd FAT		
	ommended by Board of Studies	0806-2019	1			
App	roved by Academic Council	No. 55	Date: 13-06-2019			



### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

### CURRICULUM (2022 - 2023)

Course Cod	e	Course Title L	ר <mark>ד</mark>	ŀ	<b>P</b>	J	С
ENG1902		Technical English - II 0	0 0	4	1	0	2
Pre-requisit	e	71% to 90% EPT score <b>S</b> y	yllab	us	Ve	rsior	1
				v.	. 1.(	)	
Course Obje	ectives:						
<ol> <li>To acquiningheme</li> <li>To evaluation</li> <li>To evaluation</li> <li>To spearation</li> <li>To sp</li></ol>	ire proficien d companies uate completopics. k in gramn ocabulary. ourse Outconicate profi- hend acades e different p early and co	ciently in high-end interviews and exam situations and all social nic articles and draw inferences erspectives on a topic nvincingly in academic as well as general contexts	nge o deve	f t eloj	p a	nical vast	anc
5. Synthesi	ize complex	concepts and present them in speech and writing					
		concepto una precente anenn in opecen una winang					
-	Introductio	for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal con-	versa	tio		<b>hour</b> in Br	
Ice-breaking, and America Activity: Fact	Introduction n accents (B tual and inte	for Clear Pronunciation on to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac			ons :	in Br	itisł
Ice-breaking, and America Activity: Fact <b>Module:2</b>	Introduction accents (B tual and inte Introduc	for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself			ons :		itisł
Ice-breaking, and America Activity: Fact <b>Module:2</b> Speaking: Inc	Introduction n accents (B tual and inter Introduce dividual Pres	for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself entations			ons :	in Br	itisł
Ice-breaking, and America Activity: Fact <b>Module:2</b> Speaking: Inc	Introduction n accents (B tual and inter Introduce dividual Pres	for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself			ons :	in Br	itisł
Ice-breaking, and America Activity: Fact <b>Module:2</b> Speaking: Ind Activity: Self	Introduction n accents (B tual and inter <b>Introduct</b> dividual Pres- Introduction	for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself entations ns, Extempore speech			ons : 4	in Br	itisł s
Ice-breaking, and America Activity: Fact <b>Module:2</b> Speaking: Inc Activity: Self <b>Module:3</b>	Introduction n accents (B tual and inter <b>Introduct</b> Introduction Effective	<pre>g for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself entations ns, Extempore speech Writing</pre>			ons : 4	in Br	s
Ice-breaking, and America Activity: Fact Module:2 Speaking: Ind Activity: Self Module:3 Writing: Busi Structure/ te of Minutes an	Introduction n accents (B tual and inter <b>Introduct</b> dividual Pres- Introduction <b>Effective</b> ness letters mplate of cond Memos	for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself entations ns, Extempore speech		s	4 6	hour	s s
Ice-breaking, and America Activity: Fact Module:2 Speaking: Ind Activity: Self Module:3 Writing: Busi Structure/ te of Minutes an	Introduction n accents (B tual and inter <b>Introduct</b> dividual Pres- Introduction <b>Effective</b> ness letters mplate of cond Memos	<pre>g for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself entations ns, Extempore speech Writing and Emails, Minutes and Memos ommon business letters and emails: inquiry/ complaint/ placin </pre>		s	4 6	hour	s s
Ice-breaking, and America Activity: Fact Module:2 Speaking: Ind Activity: Self Module:3 Writing: Busi Structure/ te of Minutes an Activity: Stuc	Introduction accents (B tual and inter <b>Introduc</b> dividual Pres- Introduction <b>Effective</b> ness letters mplate of cond Memos lents write a	<pre>g for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself entations ns, Extempore speech Writing and Emails, Minutes and Memos ommon business letters and emails: inquiry/ complaint/ placin </pre>		s	4 6 der	hour	s s nat
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Ice-breaking, and America: Activity: Fact Module:2 Speaking: Ind Activity: Self Module:3 Writing: Busi Structure/ te of Minutes an Activity: Stuc Module:4 Reading: Rea	Introduction accents (B tual and inter <b>Introduc</b> dividual Pres- dividual Pres- Introduction <b>Effective</b> ness letters mplate of cond dents write a <b>Compreh</b> ding Compre	<pre>g for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself entations ns, Extempore speech Writing and Emails, Minutes and Memos ommon business letters and emails: inquiry/ complaint/ placin business letter and Minutes/ Memo ensive Reading ehension Passages, Sentence Completion (Technical and Gene </pre>	ng an		4 6 der	hour hour	s s nat
Ice-breaking, and America: Activity: Fact Module:2 Speaking: Ind Activity: Self Module:3 Writing: Busi Structure/ te of Minutes an Activity: Stuc Module:4 Reading: Rea Vocabulary a	Introduction n accents (B tual and inter Introduction Introduction Effective ness letters mplate of cond dents write a Compreh ding Compreh	<pre>g for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself entations ns, Extempore speech Writing and Emails, Minutes and Memos ommon business letters and emails: inquiry/ complaint/ placin business letter and Minutes/ Memo ensive Reading ehension Passages, Sentence Completion (Technical and Gene </pre>	ng an		4 6 der	hour hour	s s nat
Ice-breaking, and America: Activity: Fact Module:2 Speaking: Ind Activity: Self Module:3 Writing: Busi Structure/ te of Minutes an Activity: Stuc Module:4 Reading: Rea Vocabulary a	Introduction n accents (B tual and inter Introduction Introduction Effective ness letters mplate of cond dents write a Compreh ding Compreh	<pre>g for Clear Pronunciation n to vowels, consonants, diphthongs. Listening to formal conv BC and CNN) as well as other 'native' accents rpretive exercises; note-making in a variety of global English ac ng Oneself entations ns, Extempore speech Writing and Emails, Minutes and Memos ommon business letters and emails: inquiry/ complaint/ placin business letter and Minutes/ Memo ensive Reading ehension Passages, Sentence Completion (Technical and Gene nalogy</pre>	ng an		4 6 der	hour hour	s s nat

Vellore Institute of Technology       B. Tech Computer Science and Engineering and Business Sys         Listening: Listening to audio files of short stories, News, TV Clips/ Documentaries, Motivation         in UK/ US/ global English accents.         Activity: Note-making and Interpretive exercises         Module:6       Academic Writing and Editing         Writing: Editing/ Proof reading symbols         Citation Formats	
Listening: Listening to audio files of short stories, News, TV Clips/ Documentaries, Motivati         in UK/ US/ global English accents.         Activity: Note-making and Interpretive exercises         Module:6       Academic Writing and Editing         Writing: Editing/ Proof reading symbols         Citation Formats	onalSpeeche
in UK/ US/ global English accents. Activity: Note-making and Interpretive exercises Module:6 Academic Writing and Editing Writing: Editing/ Proof reading symbols Citation Formats	onuiopeeene
Activity: Note-making and Interpretive exercises         Module:6       Academic Writing and Editing         Writing: Editing/ Proof reading symbols         Citation Formats	
Module:6Academic Writing and EditingWriting: Editing/ Proof reading symbolsCitation Formats	
Writing: Editing/ Proof reading symbols Citation Formats	6 hours
Citation Formats	
Structure of an Abstract and Research Paper	
Activity: Writing Abstracts and research paper; Work with Editing/ Proof reading exercise	
Module:7 Team Communication	4 hours
Speaking: Group Discussions and Debates on complex/ contemporary topics	
Discussion evaluation parameters, using logic in debates	
Activity: Group Discussions on general topics	
Module:8 Career-oriented Writing	4 hours
Writing: Resumes and Job Application Letters, SOP	
Activity: Writing resumes and SOPs	
• •	
Module:9 Reading for Pleasure	4 hours
Reading: Reading short stories	<u>.</u>
Activity: Classroom discussion and note-making, critical appreciation of the short story	
Module:10 Creative Writing	4 hours
Writing: Imaginative, narrative and descriptive prose	
Activity: Writing about personal experiences, unforgettable incidents, travelogues	
Module:11 Academic Listening	4 hours
Listening: Listening in academic contexts	1 / 77 11
Activity: Listening to lectures, Academic Discussions, Debates, Review Presentations, Researc	in Laiks,
Project Review Meetings	
Module:12 Reading Nature-based Narratives	4 hours
Narratives on Climate Change, Nature and Environment	
Activity: Classroom discussions, student presentations	
Module:13 Technical Proposals	4 hours
Writing: Technical Proposals Activities: Writing a technical proposal	
Madula 14 Dresentation Shills	<i>A</i> 1
Module:14         Presentation Skills	4 hours
Persuasive and Content-Specific Presentations Activity: Technical Presentations	
ACUVUV LECONICAL Presentations	



### VIID<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

### CURRICULUM (2022 - 2023)

			Total Lecture hour	s: 60 hours
Text Book	/ Workbook			•
1. Oxen	den, Clive and Christina Lat	ham-Koenig. New I	English File: Advanced Student	s Book.
Paper	back. Oxford University Pres	s, UK, 2017.	-	
2. Rizvi,	Ashraf. Effective Technical	Communication. Me	Graw-Hill India, 2017.	
Reference	Books			
1. with		ROM: Six-level Ge	ew English File: Advanced: 7 neral English Course for Adult	
∠.	ubramanian, T. English I cations, 2016.	Phonetics for the	Indian Students: A Work	book. Laxmi
J. 1	5 Seargeant and Bill Gre emic, 2013.	eenwell, From La	nguage to Creative Writing.	Bloomsbury
4. Krish	naswamy, N. Eco-English. B	loomsbury India, 20	015.	
5. Mant	o, Saadat Hasan. Selected Sh	ort Stories. Trans.	Aatish Taseer. Random House	India, 2012.
6. Ghos	h, Amitav. The Hungry Tide.	Harper Collins, 201	6.	
1.	sh, Amitav. The Great D rs, 2016.	erangement: Clima	te Change and the Unthink	able. Penguin
8. The N	MLA Handbook for Writers of	of Research Papers,	8th Edition. 2016.	
/www.esl-l /www.bbc.	v.eco-ction.org/dt/thinking.h ab.com/; w <u>ww.bbc.co.uk/lea</u> com/news; glish.voanews.com/a/using-v	rningenglish/;	-to-improve-listening <u>skills/381</u>	5547.html
			Role play, Assignments and	FAT
	allenging Experiments (Inc	licative)		
	ntroduction using SWOT			12 hour
	ng minutes of meetings			10 hour
	ng an abstract			10 hour
	ning to motivational speeches	and interpretation		10 hour
	e Test			6 hour
6. Writi	ng a proposal			12 hour
			Total Laboratory Hours	60 hours
			Role play, Assignments and	FAT
	nded by Board of Studies	08-06-2019		
	by Academic Council	No. 55	Date: 13-06-2019	





Course Code	Course title	L	Τ	Р	J	С
ENG1903	Advanced Technical English	0	0	2	4	2
Pre-requisite	Greater than 90 % EPT score	S	yllat		Versi	on
				v.1.0		
Course Objectives:						
	ature in any form or any technical article					
	at in social media and respond accordingly			_		
	ate with people across the globe overcoming trans-cultural	barrio	ers a	nd n	egot	ate
successfully						
Expected Cours	a Autoomo:					
	ly and write good reviews					
	rch papers, project proposals and reports					
	effectively in a trans-cultural environment					
	ead teams towards success					
	an effective manner using web tools					
	an enceuve manner using web tools					
M. 1 1. 1	A state of the sta	-1 -1			F 1	
	egotiation and Decision-Making Skills through Literary An	alysis	8		5 ho	ur
	ation and Decision-Making Skills					
	excerpts from Shakespeare's "The Merchant of Venice" (cour	t scen	e) an	d dis	scuss	101
on negotiation skills						
Critical evaluation of	f excerpts from Shakespeare's "Hamlet" (Monologue by Hamlet	) and	discu	issioi	non	
decision making skil	ls					
	ls riting reviews and abstracts through movie interpretations			5	hou	:s
Module:2 W	riting reviews and abstracts through movie interpretations			5	hou	:s
Module:2WReview writing and a	riting reviews and abstracts through movie interpretations abstract writing with competency	w		5	hou	s
Module:2WReview writing and aActivity: Watching C	<b>riting reviews and abstracts through movie interpretations</b> abstract writing with competency Charles Dickens "Great Expectations" and writing a movie revie		nario			
Module:2WReview writing and aActivity: Watching CWatching William F.	<b>riting reviews and abstracts through movie interpretations</b> abstract writing with competency Charles Dickens "Great Expectations" and writing a movie revie . Nolan's "Logan's Run" and analyzing it in tune with the preser		nario			
Module:2WReview writing and aActivity: Watching CWatching William Fof resources and write	riting reviews and abstracts through movie interpretations abstract writing with competency Charles Dickens "Great Expectations" and writing a movie revie Nolan's "Logan's Run" and analyzing it in tune with the preser ting an abstract		nario	of d	eplet	ior
Module:2WReview writing and aActivity: Watching CWatching William Fof resources and writeModule:3Total	riting reviews and abstracts through movie interpretations abstract writing with competency Charles Dickens "Great Expectations" and writing a movie revier Nolan's "Logan's Run" and analyzing it in tune with the presenting an abstract echnical Writing		nario	of d		ior
Module:2WReview writing and aActivity: Watching CWatching William Fof resources and writeModule:3TeStimulate effective li	riting reviews and abstracts through movie interpretations abstract writing with competency Charles Dickens "Great Expectations" and writing a movie revie Nolan's "Logan's Run" and analyzing it in tune with the preser ting an abstract		nario	of d	eplet	ior
Module:2WReview writing and aActivity: Watching CWatching William Fof resources and writeModule:3TotalStimulate effective liActivity: Proofreading	riting reviews and abstracts through movie interpretations abstract writing with competency Charles Dickens "Great Expectations" and writing a movie revier Nolan's "Logan's Run" and analyzing it in tune with the presenting an abstract echnical Writing nguistics for writing: content and style		nario	of d	eplet	ior
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Module:2WReview writing and aActivity: Watching CWatching William Fof resources and writeModule:3ToStimulate effective liActivity: ProofreadingModule:4ToNuances of Trans-comparent	riting reviews and abstracts through movie interpretations abstract writing with competency Charles Dickens "Great Expectations" and writing a movie revie Nolan's "Logan's Run" and analyzing it in tune with the presen- ting an abstract echnical Writing nguistics for writing: content and style ng, Statement of Purpose rans-Cultural Communication	nt scer		of d	eplet 4 ho ho	
Module:2WReview writing and aActivity: Watching CWatching William Fof resources and writeModule:3ToStimulate effective liActivity: ProofreadingModule:4ToNuances of Trans-comparent	riting reviews and abstracts through movie interpretations abstract writing with competency Charles Dickens "Great Expectations" and writing a movie revier Nolan's "Logan's Run" and analyzing it in tune with the presen- ting an abstract echnical Writing nguistics for writing: content and style ng, Statement of Purpose rans-Cultural Communication altural communication	nt scer		of d	eplet 4 ho ho	
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	t Book / Workbook	
1.	Raman, Meenakshi & Sangeeta Sharma. Technical Communication: Principles and Pra 3 <sup>rd</sup> edition, Oxford University Press, 2015.	ctice,
Ref	erence Books	
1.	Basu B.N. Technical Writing, 2011 Kindle edition	
2.	Arathoon, Anita. Shakespeare's The Merchant of Venice (Text with Paraphrase) Publishers, 2015.	, Evergreen
3.	Kumar, Sanjay and Pushp Lata. English Language and Communication Skills for Engine University Press, India, 2018.	eers, Oxford
4.	Frantisek, Burda. On Transcultural Communication, 2015, LAP Lambert AcademicPubl	
5.	Geever, C. Jane. The Foundation Center's Guide to Proposal Writing, 5 <sup>th</sup> Edition, 2 2012 The Foundation Center, USA.	2007, Reprint
6.	Young, Milena. Hacking Your Statement of Purpose: A Concise Guide to Writing You Kindle Edition.	r SOP, 2014
7.	Ray, Ratri, William Shakespeare's Hamlet, The Atlantic Publishers, 2011.	
8.	C Muralikrishna & Sunitha Mishra, Communication Skills for Engineers, 2 <sup>nd</sup> edition, N 2011.	IY: Pearson,
Mo	de of Evaluation: Quizzes, Presentation, Discussion, Role Play, Assignments	
List	of Challenging Experiments (Indicative)	
1.	Enacting a court scene – Speaking	6 hours
2.	Watching a movie and writing a review	4 hours
3.	Trans-cultural – case studies	2 hours
4.	Drafting a report on any social issue	6 hours
5.	Technical Presentation using web tools	6 hours
6.	Writing a research paper	6 hours
J- C	omponent Sample Projects	
1.	Short Films	
2.	Field Visits and Reporting	
3.	Case studies	
4.	Writing blogs	
5.	Vlogging	
	Total Hours (J-Component)	60 hours
Mo	de of evaluation: Quizzes, Presentation, Discussion, Role play, Assignments and FA	Т
	ommended by Board of Studies 08.06.2019	
	proved by Academic Council No. 55 Date: 13-06-2019	



### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

### CURRICULUM (2022 - 2023)

HUM1021		Course Title	L	T	Р	J	С
110111021		ETHICS AND VALUES	2	0	0	0	2
Pre-requisite	;	NIL	Sylla	abus	s ve	rsio	n
				v.	1.1		
Course Obje							
	-	preciate the ethical issues faced by an individual in profession, s	socie	ty ar	nd p	olity	7
		gative health impacts of certain unhealthy behaviors					
3. To apprecia	ite the nee	d and importance of physical, emotional health and social health	h				
Expected Cou	irse Outco	ome: Students will be able to:					
1. Follow sor	und moral	s and ethical values scrupulously to prove as good citizens					
Understan	d various s	social problems and learn to act ethically					
2. Understan	d the conc	ept of addiction and how it will affect the physical and mental h	nealth	L			
-		cerns in research and intellectual contexts, including academic		0	ty, ı	ise :	and
		he objective presentation of data, and the treatment of human su		ts			
4. Identify th	e main typ	ologies, characteristics, activities, actors and forms of cybercrim	ie				
Module:1	0	Good and Responsible				5 ho	
Gandhian val	ues such a	s truth and non-violence - Comparative analysis on leaders of	f pas	t an	ıd p	rese	nt –
Society's inter	ests versu	s self-interests - Personal Social Responsibility: Helping the	nee	dy,	cha	rity	and
serving the so	ciety						
Module:2	Social	Issues 1				4 ho	urs
Harassment –	Types - P	revention of harassment, Violence and Terrorism					
Module:3	Social	Issues 2				4 ho	urs
Corruption: E	thical valu	nes, causes, impact, laws, prevention – Electoral malpractices; W	White	col	lar o	rim	es -
Tax evasions -	– Unfair tr	ade practices					
	A .1.1' -	tion and Health				5 ho	11#6
Module:4		tion and ricatin					
Module:4		lism: Ethical values causes impact laws prevention III et	ffects	of	้.cm	okin	Cr.
Peer pressure	- Alcoho	lism: Ethical values, causes, impact, laws, prevention – Ill ef					0
Peer pressure Prevention of	- Alcoho f Suicides	lism: Ethical values, causes, impact, laws, prevention – Ill ef ; Sexual Health: Prevention and impact of pre-marital preg					0
Peer pressure	- Alcoho f Suicides						0
Peer pressure Prevention of	- Alcoho f Suicides Diseases				nd S		ally
Peer pressure Prevention of Transmitted I Module:5	- Alcoho f Suicides Diseases <b>Drug</b>	; Sexual Health: Prevention and impact of pre-marital preg	manc	y ar	nd S	Sexu 3 ho	ally
Peer pressure Prevention of Transmitted I Module:5 Abuse of diffe	- Alcoho f Suicides Diseases Drug erent types	; Sexual Health: Prevention and impact of pre-marital preg <b>Abuse</b> s of legal and illegal drugs: Ethical values, causes, impact, laws an	manc	y ar	nd S	Sexu 3 ho	ally
Peer pressure Prevention of Transmitted I Module:5 Abuse of diffe	<ul> <li>Alcoho</li> <li>Suicides</li> <li>Diseases</li> <li>Drug</li> <li>erent types</li> <li>Person</li> </ul>	; Sexual Health: Prevention and impact of pre-marital preg Abuse s of legal and illegal drugs: Ethical values, causes, impact, laws an nal and Professional Ethics	manc	y ar	nd S	Sexu 3 ho	ally
Peer pressure Prevention of Transmitted I Module:5 Abuse of diffe	<ul> <li>Alcoho</li> <li>Suicides</li> <li>Diseases</li> <li>Drug</li> <li>erent types</li> <li>Person</li> </ul>	; Sexual Health: Prevention and impact of pre-marital preg <b>Abuse</b> s of legal and illegal drugs: Ethical values, causes, impact, laws an	manc	y ar	nd S	Sexu 3 ho	ally





Hac	king and ot	her cyber crimes, Addiction	to mobile phone	usage, Vid	leo games and Social networkir	ng
web	osites					
Mo	dule:8	<b>Contemporary issues:</b> G	uest lectures by Ex	aperts	2 hou	rs
		Total ]	Lecture hours:		30 hours	
				·		
Ref	erence Boo	ks				
1.	Dhaliwal, I	K.K , "Gandhian Philoso	ophy of Ethics:	A Study	of Relationship between h	nis
	Presupposi	ition and Precepts, 2016, Wr	iters Choice, New	Delhi, Indi	ia.	
2.	Vittal, N, "	Ending Corruption? - How	to Clean up India?'	", 2012, Pe	enguin Publishers, UK. Pagliaro,	
3.	L.A. and	Pagliaro, A.M, "Handboo	k of Child and	Adolescen	nt Drug and Substance Abus	se:
	Pharmacol	ogical, Developmental and C	Clinical Consideration	ons", 2012	, Wiley Publishers, U.S.A.	
	Pandey, P.	K(2012), "Sexual Harassmen	nt and Law in India	a", 2012, L	ambert Publishers, Germany.	
Mo	de of Evalu	ation: CAT, Assignment, O	Quiz, FAT and Se	eminar		
Rec	commended	l by Board of Studies	26-07-2017			
App	proved by A	cademic Council	No. 46	Date	24-08-2017	





Course code	Course Title	L	Т	Р	I C
MAT 1017	Probability and Statistics	3	0	0	0 3
Pre-requisite	NIL	Syl	labu	s vei	rsion
			v	. 1.0	
Course Objectives					
	dents with a framework that will help them choose the appropria	ite desc	riptiv	re m	ethods
	analysis situations.				
5	ributions and relationships of real-time data.	1.	c	1	
115	nation and testing methods to make inference and modeling to	echniqu	les fo	or de	ecision
making.					
Expected Course	<b>Outcome:</b> At the end of this course the students are expected to				
-	standing of the probability concepts.				
	oblems connected with statistics.				
<i>y</i> 1	w to make the transition from a real problem to a probability mo	del for	that	prot	olem.
	ts to practical applications.				
	Probability:				hours
	iments, sample space, event. Definition of combinatorial pr	robabili	ty. (	Cond	litional
probability, Bayes T	heorem.				
					-
	Random Variables:	.1 .	• 1		hours
	Probability distributions: Discrete & continuous distributions, Ma				
function.	Moments (including variance) and their properties, interpretatio	n, Mor	nent	gen	erating
Module:3	Distributions:			8	hours
	and Geometric distributions, Uniform, Exponential, Norr	nal. Cl	ni-sa		
distributions.	, , , , , , , , , , , , , , , , , , ,		- 1	,	, -,
	Statistics:				hours
	ics, Basic objectives, Applications in various branches of science	with ex	ampl	es.	
	Internal and external data, Primary and secondary data.				
Population and sam	ple, Representative sample.				
					1
	<b>Data Analysis:</b> bulation of univariate data, graphical representation, Frequency c			5	hours
Classification and ta	buildion of univariate data, graphical representation, Frequency c	urves.			
M - 1 1 - (	Description Management				1
	Descriptive Measures: res - central tendency and dispersion. Bivariate data. Summa	rization			hours
conditional frequent	· ·	nzauon	, 1112	.1gm	ai and
1					
Module:7	Calculus:			7	hours
Basic concepts of D	ifferential and integral calculus, application of double and triple i	ntegral.			
	· · · · · · · · · · · · · · · · · · ·				
Module:8	Expert Lecture				hours
	Total Lecture h	iours:		45	hours



### Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

### CURRICULUM (2022 - 2023)

Te	xt Books			
1.	Introduction of Probability Models, S. M. R	oss, Academic Pre	ess, N.Y.	
2.	Fundamentals of Statistics, vol. I & II, A. G	oon, M. Gupta an	d B. Dasgu	ipta, World Press.
3	Higher Engineering Mathematics, B. S. Gre	wal, Khanna Publi	cation, De	lhi.
Ref	erence Books			
1.	A first course in Probability, S. M. Ross, Pr	entice Hall.		
2.	Probability and Statistics for Engineers, (I	Fourth Edition), I.	R. Miller,	J.E. Freund and R. Johnson,
	PHI.			
3	Introduction to the Theory of Statistics,	A. M. Mood, F.A	. Graybill	and D.C. Boes, McGraw Hill
	Education.			
4	Advanced Engineering Mathematics, (Sever	nth Edition), Peter	V. O'Neil	, Thomson Learning.
5	Advanced Engineering Mathematics, (Second	nd Edition) M. D.	Greenberg	, Pearson Education.
6	Applied Mathematics, Vol. I & II, P. N. Wa	artikar and J. N. W	artikar, Vio	lyarthiPrakashan.
Mo	de of Evaluation: Assignments, Quiz, Contin	uous assessments,	, Seminar a	nd Final assessment test
Rec	commended by Board of Studies	16-02-2019		
App	proved by Academic Council	No.56	Date	24-09-2019



### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

	ode	Course Title	L	Τ	Р	J	С
MGT200	01	Introduction To Innovation, Ip Management &	3	0	0	0	3
		Entrepreneurship					
Pre-requisite	e	NIL	1	Sylla	bus	versi	ion
					v. 1	.0	
Course Obje	ctives:						
1. Appreciate	innovat	ion as core business process, and ability to apply it to the grow	wth o	of an	orga	nizat	ion.
2. Recognize	the role	of entrepreneurship in giving the organization a sustainable co	omp	etitiv	re ad	vanta	ge.
3. Awareness	of the c	oncept and types of Intellectual Property Rights and their pro	tecti	on			
Expected Co							
1. Understand	d the con	cept and need for innovation in an organization.					
2. Appreciate	how en	trepreneurs can add value to an organization, and give it a	sus	taina	ble o	comp	etitiv
advantage.							
3. Know the o	concept	of IPR, their different types, and how to protect them.					
Module:1	Introd	uction on Innovation				6	hour
Innovation as	a core l	ousiness process, Sources of innovation, Knowledge push vs.	need	l pul	l inne	ovatio	ons.
Module:2	Buildi	ng an Innovative Organization				9	hour
Creating new	produc	ts and services, exploiting open innovation and collaboratio	n, us	se of	inne	ovatio	on fo
starting a new	venture						
e		e ovation: Co-operating across networks vs. 'go-it-alone' appro	ach				
e			ach				
Class Discuss	ion- Inn		hach			5	hour
Class Discuss Module:3	ion- Inn Entrep	ovation: Co-operating across networks vs. 'go-it-alone' appro		Igem	ent-N		
Class Discuss Module:3 Opportunity	ion- Inn Entrep recogni	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship		lgem	ent-N		
Class Discuss Module:3 Opportunity	ion- Inn Entrep recogni	ovation: Co-operating across networks vs. 'go-it-alone' appro oreneurship ion and entry strategies-Entrepreneurship as a Style of M		Igem	ent-N		<b>hour</b> aininį
Class Discuss Module:3 Opportunity Competitive 1	ion- Inn Entrep recognit Advanta	ovation: Co-operating across networks vs. 'go-it-alone' appro oreneurship ion and entry strategies-Entrepreneurship as a Style of M		ıgem	ent-N	Maint	
Class Discuss Module:3 Opportunity Competitive 4 Module:4	Entrej recogni Advanta Entrej	ovation: Co-operating across networks vs. 'go-it-alone' appro oreneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation	Mana			Maint 5	ainin hour
Class Discuss Module:3 Opportunity Competitive 4 Module:4	Entrej recogni Advanta Entrej	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning	Mana			Maint 5	ainin hour
Class Discuss Module:3 Opportunity Competitive A Module:4 Financial Pro	Entrej recogni Advanta Entrej	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning	Mana			Maint 5	ainin hour
Class Discuss Module:3 Opportunity Competitive 4 Module:4 Financial Pro Financing	Entrep recognit Advanta Entrep	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning and Valuation-Stages of financing - Debt, Venture Capi	Mana			Maint 5 for	ainin hour ms o
Class Discuss Module:3 Opportunity Competitive 4 Module:4 Financial Pro Financing Module:5	Entrep recognit Advanta Entrep ojections Essen	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning	Mana	und o	other	Maint 5 for 4	ainin hour ms o hour
Class Discuss Module:3 Opportunity Competitive 4 Module:4 Financial Pro Financing Module:5 Introduction	Entrep recognic Advanta Entrep ojections Essen and the	ovation: Co-operating across networks vs. 'go-it-alone' appro oreneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation oreneurship- Financial Planning and Valuation-Stages of financing - Debt, Venture Capi	Mana ital <i>a</i> ectiv	e - 1	other	Maint 5 f for 4 in Ir	ainin hour ms o hour
Class Discuss Module:3 Opportunity Competitive 4 Module:4 Financial Pro Financing Module:5 Introduction	Entrep recognic Advanta Entrep ojections Essen and the	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning and Valuation-Stages of financing - Debt, Venture Capi tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Perspective the state of the state of t	Mana ital <i>a</i> ectiv	e - 1	other	Maint 5 f for 4 in Ir	ainin hour ms o hour
Class Discuss Module:3 Opportunity Competitive 4 Module:4 Financial Pro Financing Module:5 Introduction Genesis and I	Entrep recognic Advanta Entrep ojections Essen and the Develop	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning and Valuation-Stages of financing - Debt, Venture Capi tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Perspective the state of the state of t	Mana ital <i>a</i> ectiv	e - 1	other	Maint 5 f for 4 in Ir ng.	ainin hour ms c hour
Class Discuss Module:3 Opportunity Competitive 4 Module:4 Financial Pro Financing Module:5 Introduction Genesis and I Module:6	Entrep recognit Advanta Entrep ojections Essen and the Develop	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning and Valuation-Stages of financing - Debt, Venture Capi tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Perspe- ment - International Context - Concept of IP Management, U s of Intellectual Property	Mana Mana ital <i>e</i> ectiv Jse in	e - 1 n ma	other IPR rketin	form form form form form form form form	hour hour hour ndia hour
Class Discuss Module:3 Opportunity Competitive 4 Module:4 Financial Pro Financing Module:5 Introduction Genesis and I Module:6 Patent- Proce	Entrep recognic Advanta Entrep ojections Essen and the Develop Type edure, L	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning and Valuation-Stages of financing - Debt, Venture Capi tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Persper ment - International Context - Concept of IP Management, U s of Intellectual Property icensing and Assignment, Infringement and Penalty- Trader	Mana Mana Ital <i>a</i> ectiv Use in mark	e - 1 n ma	IPR rketin	Maint 5 f for 4 in Ir ng. 4 mark	hour hour hour ndia hour
Class Discuss Module:3 Opportunity Competitive 4 Module:4 Financial Pro Financing Module:5 Introduction Genesis and I Module:6 Patent- Proce	Entrep recognic Advanta Entrep ojections Essen and the Develop Type edure, L	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning and Valuation-Stages of financing - Debt, Venture Capi tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Perspe- ment - International Context - Concept of IP Management, U s of Intellectual Property	Mana Mana Ital <i>a</i> ectiv Use in mark	e - 1 n ma	IPR rketin	Maint 5 f for 4 in Ir ng. 4 mark	hour ms o hour ndia - hour
Class Discuss Module:3 Opportunity Competitive A Module:4 Financial Pro Financing Module:5 Introduction Genesis and I Module:6 Patent- Proce example of t	Entrep recognic Advanta Entrep ojections Essen and the Develop Type edure, L	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning and Valuation-Stages of financing - Debt, Venture Capi tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Persper ment - International Context - Concept of IP Management, U s of Intellectual Property icensing and Assignment, Infringement and Penalty- Trader	Mana Mana Ital <i>a</i> ectiv Use in mark	e - 1 n ma	IPR rketin	Maint 5 f for 4 in Ir ng. 4 mark	hour hour hour ndia hour
Class Discuss Module:3 Opportunity Competitive A Module:4 Financial Pro Financing Module:5 Introduction Genesis and I Module:6 Patent- Proce example of t	Entrep recognit Advanta Entrep ojections Essen and the Develop Type edure, L rademar	ovation: Co-operating across networks vs. 'go-it-alone' appro preneurship ion and entry strategies-Entrepreneurship as a Style of M ge- Use of IPR to protect Innovation preneurship- Financial Planning and Valuation-Stages of financing - Debt, Venture Capi tials of Intellectual Property Rights (IPR) e economics behind development of IPR: Business Persper ment - International Context - Concept of IP Management, U s of Intellectual Property icensing and Assignment, Infringement and Penalty- Trader	Mana Mana Ital <i>a</i> ectiv Use in mark	e - 1 n ma	IPR rketin	Vaint 5 for 4 in Ir ng. 4 marl prot	hour ms o hour ndia - hour



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### CURRICULUM (2022 - 2023)

Cop	yright- In	troduction, Industrial Desig	ns- What is design	n? How to	protect? Class Dis	scussion- Major
Cou	rt battles 1	egarding violation of patents	between corporat	e companie	es.	
Mo	dule:8	Contemporary Issues				2 hours
Gue	est lecture	by Industry Experts or R&D	organization			
				Total Le	cture hours:	45 hours
Tex	t Book(s)					
1.	Busines	s Transformations in the Era	of Digitalization (2	2019), Alou	ılou, W, IGI Global	l.
2.	Innovat	ive science teaching (2019), N	Iohan, R. (2019). I	PHI Learni	ng Pvt. Ltd.	
Ref	erence Bo	ooks				
1.	Research	h on Entrepreneurship, Inno	vation, and Interna	itionalizatio	on, Pereira, E. T. IC	GI Global.
2.	Creative	e marginality: Innovation at th	ne intersections of	social scier	nces (2019), Dogan,	M Routledge.
3.	Internat	ional intellectual property in	an integrated world	d economy	(2019), Abbott, F. I	M., Cottier, T.,
	& Gurry	y, F. (2019), Aspen Publisher	5.			
Mo	de of Eva	luation: CAT / Assignmen	t / Quiz / FAT			
Rec	ommend	ed by Board of Studies	29-01-2021			
App	proved by	Academic Council	No. 61	Date	18-02-2021	



Course Code	COURSE TITLE	L	T	P	С
PHY1005	Modern Physics	3	0	2	4
Pre requisites		Syl	labus		ion
			<b>v.</b> 1	1.0	
Course Objective					
-	pply mathematics and physics in engineering applications				
-	ear understanding of the physics related concepts and of contra-	-	ry issu	les	
3. To inculcate r	realistic skills of creating unique insight from what is being obs	erved.			
Course Outcome	20				
	course the student will be able to				
	edge of thermodynamics to realistic problems				
	erstanding of the oscillatory motion of various objects and sys	tems			
	l wave nature of light and its applications				
-	ots of electromagnetic waves and their propagation				
-	im mechanical ideas to subatomic domain.				
11,7,1	ne fundamental principles of a laser and its types and their app	lication	in fib	er on	tics
	te funciamental principles of a faser and its types and their app	incation	111 110	er op	ues.
Module:1 The	rmodynamics			7 ho	)]]f(
Thermodynamics	Terminology- system & surroundings, types of systems	, Diffe	erent	types	
=	Terminology- system & surroundings, types of systems Concept of Heat Capacity and work (analytic treatment). Ze				0
processes in TD,	Concept of Heat Capacity and work (analytic treatment), Ze	roth an	d Firs	st law	5 O
processes in TD, thermodynamics	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion.	roth an Concept	d Firs	st law Entre	s o s o opy
processes in TD, thermodynamics spontaneous and	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion. O driven processes, Carnot's cycle, Second Law of thermody	roth an Concept mamics	nd Firs : of :- Clau	st law Entre usius	s o s o opy and
processes in TD, thermodynamics spontaneous and Kelvin's statemen	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion. O driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop	roth an Concept mamics by from	nd Firs of - Clau Carno	st law Entre usius	s o s o opy and
processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Change i	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion. O driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop n reversible and Irreversible processes. Third law of Thermody	roth an Concept mamics by from	nd Firs of - Clau Carno	st law Entre usius ot's c	s o opy- and ycle
processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Change i Module:2 Osc	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion. O driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop n reversible and Irreversible processes. Third law of Thermod illations	roth an Concept ynamics by from ynamics	id Firs of - Clau Carno s.	st law Entro Isius Dt's c 7 ho	s o opy and ycle
processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Change i <b>Module:2</b> Osc Periodic motion,	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion. Of driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop n reversible and Irreversible processes. Third law of Thermody illations simple harmonic motion, characteristics of simple harmonic	roth an Concept ynamics by from ynamics c motio	id Firs of - Clau Carno s.	st law Entre Isius ot's c 7 he oratio	s o opy and ycle
processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Change i <b>Module:2</b> Osc Periodic motion, simple spring mass	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion. Of driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop n reversible and Irreversible processes. Third law of Thermody illations simple harmonic motion, characteristics of simple harmonic ss system. Damped harmonic oscillator – heavy, critical and	roth an Concept ynamics by from ynamics c motio light da	d Firs of - Clau Carno s. n, vib ampin	st law Entro Isius Dt's c 7 ho oration g, en	s o opy and ycle <b>our</b> s n o erg
processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Change i <b>Module:2</b> Osc Periodic motion, simple spring mass	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion. Of driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop n reversible and Irreversible processes. Third law of Thermody illations simple harmonic motion, characteristics of simple harmonic	roth an Concept ynamics by from ynamics c motio light da	d Firs of - Clau Carno s. n, vib ampin	st law Entro Isius Dt's c 7 ho oration g, en	s o s o opy and ycle <b>ours</b> n o ergy
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processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Change i Module:2 Osc Periodic motion, simple spring mass decay in a dampe Resonance. Module:3 Eler	Concept of Heat Capacity and work (analytic treatment), Zee Work done in Isothermal and adiabatic expansion. Of driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop n reversible and Irreversible processes. Third law of Thermod illations simple harmonic motion, characteristics of simple harmonic es system. Damped harmonic oscillator – heavy, critical and ed harmonic oscillator, quality factor, forced mechanical an ments of wave optics	roth an Concept ynamics by from ynamics c motio light da d electr	d Firs of Carno s. on, vib ampin rical o	t law Entro Isius ot's c <b>7 ho</b> g, en g, en scilla <b>6 ho</b>	i o s o opy and ycle <b>ours</b> n o ergy tors
processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Charge i Module:2 Osc Periodic motion, simple spring mas decay in a dampe Resonance. Module:3 Eler Interference-Supe	Concept of Heat Capacity and work (analytic treatment), Zee Work done in Isothermal and adiabatic expansion. Of driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entropy n reversible and Irreversible processes. Third law of Thermod illations simple harmonic motion, characteristics of simple harmonic es system. Damped harmonic oscillator – heavy, critical and ed harmonic oscillator, quality factor, forced mechanical an ments of wave optics reposition principle and Young's double slit experiment- T	roth an Concept ynamics by from ynamics c motio light da d electr heory o	d Firs of Carno s. on, vib ampin rical o	t law Entro Isius Dt's c 7 ho oration g, en scilla 6 ho erfere	ours opy and ycle ours n o ergy tors
processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Charge i Module:2 Osc Periodic motion, simple spring mass decay in a dampe Resonance. Module:3 Eler Interference-Supe fringes, Types of	Concept of Heat Capacity and work (analytic treatment), Zee Work done in Isothermal and adiabatic expansion. Of driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop n reversible and Irreversible processes. Third law of Thermod illations simple harmonic motion, characteristics of simple harmonic es system. Damped harmonic oscillator – heavy, critical and ed harmonic oscillator, quality factor, forced mechanical an ments of wave optics	roth an Concept ynamics by from ynamics c motio light da d electr heory o ide, Fre	d Firs of Carno s. on, vib ampin rical o of Int	t law Entro Isius ot's c <b>7 ho</b> oration g, en scilla <b>6 ho</b> Bipr	s o s o ppy and ycle ours n o ergy tors
processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Charge i Module:2 Osc Periodic motion, simple spring mass decay in a dampe Resonance. Module:3 Eler Interference-Supe fringes, Types of Newton's rings, I	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion. Of driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop n reversible and Irreversible processes. Third law of Thermod <b>illations</b> simple harmonic motion, characteristics of simple harmonic es system. Damped harmonic oscillator – heavy, critical and ed harmonic oscillator, quality factor, forced mechanical an <b>ments of wave optics</b> reposition principle and Young's double slit experiment- T interference- division of wave front and division of amplitu	roth an Concept ynamics by from ynamics c motio light da d electr heory o ide, Fre Diffracti	d Firs of Carno s. on, vib ampin cical o of Int esnel's ion fro	t law Entro Isius ot's c <b>7 ho</b> oration g, en scilla <b>6 ho</b> Bipr	s o s o ppy and ycle ours n o ergy tors
processes in TD, thermodynamics spontaneous and Kelvin's statemen Entropy Change i Module:2 Osc Periodic motion, simple spring mass decay in a dampe Resonance. Module:3 Eler Interference-Supe fringes, Types of Newton's rings, I slit, Diffraction free	Concept of Heat Capacity and work (analytic treatment), Ze Work done in Isothermal and adiabatic expansion. Of driven processes, Carnot's cycle, Second Law of thermody ts, Concept of Heat and work Engines, Derivation of Entrop n reversible and Irreversible processes. Third law of Thermod illations simple harmonic motion, characteristics of simple harmonic es system. Damped harmonic oscillator – heavy, critical and ed harmonic oscillator, quality factor, forced mechanical an ments of wave optics erposition principle and Young's double slit experiment- T interference- division of wave front and division of amplitu Diffraction, Difference between interference and diffraction, I	roth an Concept ynamics by from ynamics c motio light da d electr heory o ide, Fre Diffracti	d Firs of Carno s. on, vib ampin cical o of Int esnel's ion fro	t law Entro Isius ot's c <b>7 ho</b> oration g, en scilla <b>6 ho</b> Bipr	s o s o opy and ycle ours n o erg tors ours ence
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### VIIC® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

### CURRICULUM (2022 - 2023)

Module:6	Crystallography 5 hours					
Conductor,	emiconductor and Insulator; Basic concept of Band theory. Basic terms, types of crystal					
systems, Br	vais lattices, miller indices, d spacing.					
Module: 7	Laser and Fiber Optics6 hours					
Properties of	laser beams: mono-chromaticity, coherence, directionality and brightness, Einstein's					
theory of matter radiation interaction and A and B coefficients; amplification of light by population						
inversion, different types of lasers: Ruby Laser, CO2 and Nd:YAG lasers; applications of lasers in						
engineering	Light propagation through fibers, Acceptance angle, Numerical Aperture, Types of fibers					
- step index	graded index, single mode & multimode fibers. Detector- PIN photodiode .					
Module: 8	Contemporary issues 2 hours					
Guest Lect	es by Industry and R&D Organizations.					
	Total Lecture hours: 45 hours					
Textbook(						
,	hkar, Fundamentals of Physics: Mechanics, Relativity, and Thermodynamics, (2014), Yale					
	university Press, USA.					
	H. D. Young and R. A. Freedman, University Physics with Modern Physics, 2020, 15th Edition,					
	Pearson, USA.					
	R. A. Serway, J. W. Jewett Jr., Physics for Scientists and Engineers with Modern Physics, 2019,					
	dition, Cengage Learning, USA.					
	D. K. Mynbaev and Lowell L. Scheiner, Fiber Optic Communication Technology, 2011, 1st					
	Edition, Pearson, USA M.N.O. Sadiku, Principles of Electromagnetics, 2015, 6th Edition, Oxford University Press,					
	W. Silfvast, Laser Fundamentals, 2012, 2nd Edition, Cambridge University Press, India.					
Reference						
1. H.J.	H. J. Pain, The Physics of vibrations and waves, 2013, 6th Edition, Wiley Publications, India.					
-	K. Krane, Modern Physics, 2020, 4th Edition, Wiley Edition, India.					
2	Lasers: Principles and Applications, J. Wilson and J.F.B. Hawkes (2003)					
	aluation: CAT / Assignment / Quiz / FAT / Project / Seminar					
	ist of Challenging Experiments (Indicative) Clean Energy- Solar Cell					
	Integrated Optics- Angle of Prism					
_	Quality Check for soft drinks- Refractive Index of liquid					
· ·						
	Advanced Material Analysis through Quantum Physics- Photoelectric Effect					
	Engineering Application of Nanomaterials					
	Electron Diffraction					
	Monochromators in Sophisticated Instrument – Laser Grating					
_	Integrated Optics- Angle of Minimum Deviation					
-	Acceptance Angle and Numerical Aperture – Optical Fiber					
10 Phase	nd Group Velocity of EM waves					
Total Laboratory Hours 30 hours						
Mode of Assessment: Assessments/ Mid Term Lab/ FAT / Project						
	ed by Board of Studies 07.06.2019					
Approved b	Academic Council55Date13.6.2019					



## UNIVERSITY CORE

B. Tech. Computer Science and Engineering and Business Systems (in collaboration with TCS)

## FLC4097 - Foreign Language Course Basket

Sl. No.	Course Code	Course Title	Page No.
1.	ESP1001	ESPANOL FUNDAMENTAL	152
2.	ESP2001	ESPANOL INTERMEDIO	154
3.	FRE2001	Francais progressif	156
4.	GER1001	Grundstufe Deutsch	158
5.	GER2001	Mittelstufe Deutsch	160
6.	GRE1001	Modern Greek	162
7.	JAP1001	Japanese for Beginners	164
8.	RUS1001	Russian for Beginners	166





B. Tech Computer Science and Engineering and Business Systems

Course Code	Course Title	L	Т	Р	J	С
ESP1001	ESPAÑOL FUNDAMENTAL	2	0	0	0	2
Pre-requisite	NIL	9	Sylla	bus v	versio	n
i ie-iequisite				v. 1.0	)	

#### Course Objectives:

The course gives students the necessary background to:

- 1. Demonstrate Proficiency in reading, writing, and speaking in basic Spanish. Learning vocabulary related to profession, education centres, day today activities, food, culture, sports and hobby, family set up, workplace, market and classroom activities is essential.
- 2. Demonstrate the ability to describe things and will be able to translate into English and vice versa.
- 3. Describe in simple terms (both in written and oral form) aspects of their background, immediate environment and matters in areas of immediate need.

#### Expected Course Outcome:

The students will be able to

- 1. Remember greetings, giving personal details and Identify genders by using correct articles
- 2. Apply the correct use of SER, ESTAR and TENER verb for describing people, place and things
- 3. Create opinion about time and weather conditions by knowing months, days and seasons in Spanish
- 4. Create opinion about people and places by using regular verbs
- 5. Apply reflexive verbs for writing about daily routine and create small paragraphs about hometown, best friend and family

#### Module: 1 Abecedario, Saludos y Datos personales: Origen, Nacionalidad, Profesión 3 hours

Competencia Gramática: Vocales y Consonantes. Artículos definidos e indefinidos (Numero y Genero).

Competencia Escrita: Saludos y Datos personales

#### Module: 2 | Edad y posesión. Números (1-20)

Competencia Gramática: Pronombres personales. Adjetivos. Los verbos SER y TENER. Competencia Escrita: Escribe sobre mismo/a y los compañeros de la clase

3 hours

s

Module: 3Vocabulario de Mi habitación. Colores. Descripción de lugares y cosas5 hoursCompetencia Gramática: Adjetivos posesivos. El uso del verbo ESTAR. Diferencia entre SER y ESTAR.<br/>Competencia Escrita: Mi habitación5 hours

M - 1 1- 4	Mi familia. Números (21-100). Direcciones. Expresar la hora. Los meses	5 hour
Module: 4	del año.	5 hours

Competencia Gramática: Frases preposicionales. Uso del HAY. La diferencia entre MUY y MUCHO. Uso del verbo GUSTAR

Competencia Escrita: Mi familia. Dar opiniones sobre tiempo

#### Module: 5Expresar fechas y el tiempo. Dar opiniones sobre personas y lugares.5 hours

Competencia Gramática: Los verbos regulares (-AR, -ER, -IR) en el presente. Adjetivosdemostrativos. Competencia Escrita: Mi mejor amigo/a. Expresar fechas. Traducción ingles a español y Español a Ingles.





Mo	dule: 6	Describir el diario. Las activio	dades cotidianas.			3 hours
Con	npetenci	a Gramática: Los Verbos y pronc	ombres reflexivos. I	Los verbo	os pronominales co	n e/ie,o/ue,
e/i,	u/ue.					
Con	npetenci	a Escrita: El horario. Traducción	ingles a español y H	Español a	Ingles.	
Mod	1110' /	Dar opiniones sobre comidas y Describir mi ciudad y Ubicar lo		-	á haciendo.	4 hours
Con		a Gramática: Los verbos irregula			der + Infinitivo. (	Competencia
	-	nversación en un restaurante. Trac	-			-
Mi U	Universi	dad. La clase.Mi fiesta favorita.				
Mod	ule: 8	Guest Lectures / Native Spe	akers			2 hours
		Total Lec	cture hours			30 hours
Text	Book(s	)				
1.		ook: "Aula Internacional 1", Ja		1 Garcia,	Agustin Garmen	dia, Carmen
		Goyal Publication; reprinted Edit	tion, (2010)			
Refe	rence B	ooks				
1.	"¡Acció	n Gramática!" Phil Turk and Mi	ke Zollo, Hodder	Murray, 1	London 2006. "Pra	ictice makes
	perfect:	Spanish Vocabulary", Dorothy R	ichmond, McGraw	Hill Con	temporary, USA, 2	012.
2.	"Practic	ce makes perfect: Basic Spanish'	', Dorothy Richm	ond, McC	Graw Hill Contem	porary, USA
	2009.					
3.	"Pasapo	orte A1 Foundation", Matilde (	Cerrolaza Aragón,	Óscar (	Cerrolaza Gili, Beg	goña Llovet
	Barque	ro, Edelsa Grupo, España, 2010.				
Reco	mmend	led by Board of Studies	22.02.2016			
Appr	oved by	Academic Council	No. 41	Date	17.06.2016	



## VIT® Vellore Institute of Technology

#### CURRICULUM (2022 - 2023)

Cou	rse Code	Course Title	L	Т	Р	J	C
E	SP2001	ESPAÑOL INTERMEDIO	2	0	2	0	3
Pre-requisite			Sy	yllabus	s vers	ion	
				v.	1.0		
Course Obj							
		ecessary background to:					
1. Enable s	students to read, l	listen and communicate in Spanish in their day	y-to-day lif	e.			
2. Enable s	students to descri	be situations by using present, past and future	e tenses in S	Spanisł	1.		
3. Enable t	to develop the con	mprehension skill in Spanish language.					
-	ourse Outcome:						
The students v							
1. Create s PARA	entences in near f	future and future tenses and correctly using th	e prepositi	ons lik	e PO	R an	d
2. Create s	entences in preter	rito perfecto and correctly use the direct and i	ndirect obj	ect pro	noun	15	
	1	o likes and dislikes and also give commands in	,	1			
		ense by using imperfecto and idefinido forms				-	
		panish at places like restaurants, hotels, Shops					
		nt Spanish speaking countries and its culture a					
0. 0		in spanish speaking countries and its culture a	and traditio	ons.			
		in spanish speaking countries and its culture a	and traditio	ons.			
Module:1	-	1 – 1 millón). Expresar los planes <b>ftrs</b> Los		ons.	7	hou	's
	-			ons.	7	hou	:s
Module:1	Números (101 ordinales.		números				
<b>Module:1</b> Competencia Uso del POF	<b>Números (10</b> <b>ordinales.</b> a Gramática: Futu X y PARA.	<b>1 – 1 millón). Expresar los planesfirs Los</b> uros cercanos (Ir+a+Infinitivo). Futuros (Ve	<b>números</b> erbos regu				
<b>Module:1</b> Competencia Uso del POF Competencia	Números (102 ordinales. a Gramática: Futa A y PARA. a Escrita: Traduc	<b>1 – 1 millón). Expresar los planesftrs Los</b> uros cercanos (Ir+a+Infinitivo). Futuros (Ve cción ingles a español y español a Ingles.	<b>números</b> erbos regu				
<b>Module:1</b> Competencia Uso del POF Competencia	<b>Números (10</b> <b>ordinales.</b> a Gramática: Futu X y PARA.	<b>1 – 1 millón). Expresar los planesftrs Los</b> uros cercanos (Ir+a+Infinitivo). Futuros (Ve cción ingles a español y español a Ingles.	<b>números</b> erbos regu				
Module:1 Competencia Uso del POF Competencia Comprensión	Números (101 ordinales. a Gramática: Futu & y PARA. a Escrita: Traduc n - Los textos y V	<b>1 – 1 millón). Expresar los planesftrs Los</b> uros cercanos (Ir+a+Infinitivo). Futuros (Ve cción ingles a español y español a Ingles. <sup>7</sup> ideos	números erbos regu		irregu	ılares	5).
Module:1 Competencia Uso del POF Competencia Comprensión Module:2	Números (101 ordinales. a Gramática: Futa y PARA. a Escrita: Traduc n - Los textos y V Las ropas, col	<b>1 – 1 millón). Expresar los planesftrs Los</b> uros cercanos (Ir+a+Infinitivo). Futuros (Ve cción ingles a español y español a Ingles. <sup>7</sup> ideos <b>lores y tamaños. Costar, valer,descuentos</b>	números erbos regu y rebajas	lares e	irregu		5).
Module:1 Competencia Uso del POF Competencia Comprensión Module:2 Competencia	Números (101 ordinales. a Gramática: Futu a PARA. a Escrita: Traduc a - Los textos y V Las ropas, col Gramática: Prone	1 – 1 millón). Expresar los planes <b>ftrs Los</b> uros cercanos (Ir+a+Infinitivo). Futuros (Ve cción ingles a español y español a Ingles. Videos <b>lores y tamaños. Costar, valer,descuentos</b> combres objetivos directos e indirectos. El ver	números erbos regu y rebajas bo Gustar	lares e y Disg	irregu	ılares 8 ho	s).
Module:1 Competencia Uso del POF Competencia Comprensión Module:2 Competencia	Números (101 ordinales. a Gramática: Futu a PARA. a Escrita: Traduc a - Los textos y V Las ropas, col Gramática: Prone	<b>1 – 1 millón). Expresar los planesftrs Los</b> uros cercanos (Ir+a+Infinitivo). Futuros (Ve cción ingles a español y español a Ingles. <sup>7</sup> ideos <b>lores y tamaños. Costar, valer,descuentos</b>	números erbos regu y rebajas bo Gustar	lares e y Disg	irregu	ılares 8 ho	5). ur
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B. Tech Computer Science and Engineering and Business Systems

Comprensión oral: Introducción personal, Expresar los planes futuros. ¿Qué vas a hacer en laspróximas vacaciones?

Comprensión auditiva: Las preguntas sobre un cuento auditivo. Relacionar el audio con lasimágenes. Las preguntas basadas en canciones.

Medio de transporte: Comprar y Reservar billetes.

#### Module:6 Diálogos entre dos

5 hours

Comprensión oral: Diálogos entre dos (cliente y tendero de ropas, pasajero y empleado, en unrestaurante, Reservación de habitación en un hotel). Presentación en una entrevista.

Comprensión auditiva: Las preguntas basadas en canciones. Las preguntas basadas en diálogos.

#### Presentación de los países hispánicos. Module:7

5 hours Comprensión oral: Dialogo entre un médico y paciente. Presentación de los países hispánicos

Describir su infancia. Describir vacaciones últimas o las actividades de último fin de semana. Comprensión auditiva: Rellenar los blancos del cuento en pasado. Las preguntas basadas en elcuento.

Las preguntas basadas en un anuncio

Module:8	Guest Lectures/ Native Speakers		2 hours	
	Total Lecture hours:			

#### Text Book(s)

"Aula Internacional 1", Jaime Corpas, Eva Garcia, Agustin Garmendia, Carmen Soriano Goyal 1. Publication; reprinted Edition, Delhi (2010).

#### **Reference Books**

1.	"¡AcciónGramática!", Phil Turk and Mike Zollo, Hodder Murray, London 2006.
2.	"Practice makes perfect: Spanish Vocabulary", Dorothy Richmond, McGraw Hill Contemporary,
	USA, 2012.

- "Pasaporte A1 Foundation", Matilde Cerrolaza Aragón, Óscar Cerrolaza Gili, Begoña Llovet 3. Barquero, Edelsa Grupo, España, 2010.
- 4. "Practice makes perfect: Basic Spanish", Dorothy Richmond, McGraw Hill Contemporary, USA 2009.

Recommended by Board of Studies			
Approved by Academic Council	No.41	Date	17.06.2016



## VIT<sup>®</sup> Vellore Institute of Technology

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Course Code	Course Title	L	Τ	Р	J	С
FRE2001	Français Progressif	2	0	1	0	3
Pre-requisite	Français quotidien	Syllabus version			n	
				v. 1.0		

#### **Course Objectives:**

The course gives students the necessary background to:

- 1. Understand isolated sentences and frequently used expressions in relation to immediate priorityareas (personal or family information, shopping, close environment, work).
- 2. Communicate in simple and routine tasks requiring only a simple and direct exchange of information on familiar and habitual topics.
- 3. Enable students to describe with simply means his training, his immediate environment and evoke familiar and habitual subjects, evoke subjects that correspond to immediate needs.

#### Expected Course Outcome:

The students will be able to :

- **1**. Understand expressions in French.
- 2. Create senteces by using frequent lexicon related to himself, his family, his close environment (family, shopping, work, school, etc).
- 3. Understand simple, clear messages on internet, authentic documents.
- 4. Analyse predictable information in common documents, such as advertisements, flyers, menus, schedules, simple personal letters.
- 5. Create simple and routine tasks.
- 6. Create simple and direct exchange of information on familiar activities and topics.

#### Module:1 Expressions simples

La vie quotidiennes - Le verbe pronominal - Le passé composé avec l'auxiliaire - avoir et être- le passérécent : venir de + infinitif - Le comparatif - Le superlatif - Les mots interrogatifs (les trois formes) Savoir-faire pour: Faire des achats, faire des commandes dans un restaurant, poser des questions.

#### Module:2 Les activitiés quotidiennes

La vie privée et publique (Les achats, Les voyages, les transports-La nourriture, etc.) - Les lieux de la ville - Les mots du savoir-vivre - Les pronoms indéfinis - Les pronoms démonstratifs - Les pronoms complémentsobjets directs/ indirects - La formation du future simple et future proche Savoir-faire pour: Réserver les billets pour le voyage, réserver les chambres dans un hôtel, S'informer surles lieux de la ville, indiquer la direction à un étranger.

Les loisirs (sports/spectacles/activités) - Les moments de la journée, de l'année- La fête indienne et française – Les goûts - L'impératif - La négation de l'impératif-La place du pronom à l'impératif avec un verbe pronominal.

Savoir-faire pour: Parler de ses goûts, raconter les vacances, formuler des phrases plus compliquées, Raconter les souvenirs de l'enfance, parler sur la tradition de son pays natal.

8 hours

6 hours

7 hours



# (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Module:4	La Francophonie			7 hours
L'espace fra	ancophone - Première appr	oche de la sociét	é française	- La consommation alimentaire -
	un objet – décrire une tenue	-		
				e-Cartes et messages d'invitation,
d'acceptatio	n ou de refus -Article de p	resse - rédaction o	d'un événem	ient.
Module:5	La culture française			5 hours
	-	les fêtes en Fran	nce – Parler	de sa famille – réserver un billet
à l'agence -	la gastronomie française			
Module:6	La description			5 hours
				server une chambre dans un hôtel
– les plus gi	ands français - raconter des	évènements pass	és	
Module:7	S'exprimer			5 hours
		ne – placer une co	ommande a	u restaurant la mode - parler de
son projet c	l'avenir.			
Module:8	Guest lecures : Guest lecu	man / Nativa ap cal	1040	2 hours
Module.o	Guest lecules . Guest lecu	±	Lecture h	
		101a		5011S. 45 Hours
Text Book	(s)			
	go 1, Méthode de français,	Annie Berthet, H	achette. Pari	s 2010.
	Ego 1, Cahier d'exercices, Ar			
Reference	0			
		ancais, Régine Mé	érieux, Yves	Loiseau, Les Éditions Didier, 2010.
				Loiseau, Les Éditions Didier, 2010
	nce jeunes-1, Méthode de fr	8		
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Mode of E	valuation: CAT / Assignn	nent / Quiz / F	AT / Projec	ct / Seminar
	nded by Board of Studies		- /	
	by Academic Council	No.41	Date	17.06.2016
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#### VIID<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course Code	Course Title	L	Τ	Р	J	С
GER1001	GRUNDSTUFE DEUTSCH	2	0	0	0	2
Pre-requisite	NIL		Sylla	bus	versi	on
110 10 10 10 10				v. 1.(	)	
<b>Course Objectives</b>	:					
The course gives st	udents the necessary background to:					
1. Demonstrate Pr	roficiency in reading, writing, and speaking in basic Gerr	nan. I	earni	ng v	ocabı	ılary
related to profes	ssion, education centres, day-to-day activities, food, culture	e, spor	tsand	hob	by, fa	mily
set up, workplac	ce, market and classroom activities are essential.					
2. Make the studer	nts industry oriented and make them adapt in the German	culture	2.			
Expected Course						
The students will be				· 6		
e	ting people, introducing oneself and understanding basic	expre	ssions	s inG	ferma	n.
	ic grammar skills to use these in a meaning way.					
0	nner's level vocabulary	_				
	s in German on a variety of topics with significant precisio		in dei	taıl.		
5. Apply good con	nprehension of written discourse in areas of special interes	ts.				
Madula 1					2 1	
Module: 1		1		1		our
	skunde, Alphabet, Personalpronomen, Verben- heissen,	komm	.en, w	vohn		
Begrüssung, Lande Zahlen (1-100), W	7-Fragen, Aussagesätze, Nomen- Singular und Plural,				en, le	rne
Begrüssung, Lande Zahlen (1-100), W Unbestimmter Artil	7-Fragen, Aussagesätze, Nomen- Singular und Plural, kel)	der A	Artike	1 -Be	en, le	rne
Begrüssung, Lande Zahlen (1-100), W Unbestimmter Artil	7-Fragen, Aussagesätze, Nomen- Singular und Plural,	der A	Artike	1 -Be	en, le	rne
Begrüssung, Lande Zahlen (1-100), W Unbestimmter Artil	7-Fragen, Aussagesätze, Nomen- Singular und Plural, kel)	der A	Artike	1 -Be	en, le estim	mte
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Begrüssung, Lande Zahlen (1-100), W Unbestimmter Artil Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronomer Modalverben, Uhrz Lernziel : Sätze mi Module: 4 Übersetzung: (Deut	7-Fragen, Aussagesätze, Nomen- Singular und Plural, kel) stellen, Grundlegendes Verständnis von Deutsch, Deutsch erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- F reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A eit, Präpositionen, Lebensmittel, Getränkeund Essen, Farh t Modalverben, Verwendung von Artikel, Adjektiv beim V rsch – Englisch / Englisch – Deutsch)	der A land ir preszei frage, Artikel pen, Ti	Artike n Euro ten u Impe ) Tree	opa nd derativ	en, le estim 3 h lie W mit 5 h reverb	nou och ,Sie
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Begrüssung, Lande Zahlen (1-100), W Unbestimmter Artil Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronomer Modalverben, Uhrz Lernziel : Sätze mi Module: 4 Übersetzung: (Deut Lernziel : Die Übu	7-Fragen, Aussagesätze, Nomen- Singular und Plural, kel) stellen, Grundlegendes Verständnis von Deutsch, Deutsch erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- F reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A eit, Präpositionen, Lebensmittel, Getränkeund Essen, Farh t Modalverben, Verwendung von Artikel, Adjektiv beim V rsch – Englisch / Englisch – Deutsch)	der A land ir preszei frage, Artikel pen, Ti	Artike n Euro ten u Impe ) Tree	opa nd derativ	en, le estim 3 h lie W mit 5 h reverb	rme mte nou: och "Sid
Begrüssung, Lande Zahlen (1-100), W Unbestimmter Artil Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronomer Modalverben, Uhrz Lernziel : Sätze mi Module: 4 Übersetzung: (Deut Lernziel : Die Übu	7-Fragen, Aussagesätze, Nomen- Singular und Plural, kel) stellen, Grundlegendes Verständnis von Deutsch, Deutsch erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- F reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A eit, Präpositionen, Lebensmittel, Getränkeund Essen, Fark t Modalverben, Verwendung von Artikel, Adjektiv beim V rsch – Englisch / Englisch – Deutsch) ng von Grammatik und Wortschatz	der A land ir preszei frage, Artikel pen, Ti	Artike n Euro ten u Impe ) Tree	opa nd derativ	en, le estim 3 h lie W mit 5 h reverb	nou och ,Sie
Begrüssung, Lande Zahlen (1-100), W Unbestimmter Artii Lernziel : Sich vor Module: 2 Konjugation der V Hobbys, Berufe, A Lernziel: Sätze sch Module: 3 Possessivpronomer Modalverben, Uhrz Lernziel : Sätze mi Ubersetzung: (Deut Lernziel : Die Übu	7-Fragen, Aussagesätze, Nomen- Singular und Plural, kel) stellen, Grundlegendes Verständnis von Deutsch, Deutsch erben (regelmässig /unregelmässig),das Jahr- Monate, Jah Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- F reiben, über Hobbys, Berufe erzählen, usw n, Negation, Kasus (Bestimmter- Unbestimmter A eit, Präpositionen, Lebensmittel, Getränkeund Essen, Farh t Modalverben, Verwendung von Artikel, Adjektiv beim V rsch – Englisch / Englisch – Deutsch)	der A land ir preszei frage, Artikel pen, Ti	Artike n Euro ten u Impe ) Tree	opa nd derativ	en, le estim 3 h lie W mit 5 h reverb	rme mte noun och "Sie noun Den,



## Villore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	1 (					
Mod			D 11 1 D' 1		1.1 1	3 hours
		e Familie, Bundesländer in	· · · · ·	fest in Dei	utschland,	
Lernz	ziel : Ak	tiver, selbständiger Gebrau	ich der Sprache			
Mod	ulo. 7					4 hours
Dialog						4 nours
a)	-	äche mit einem/einer Freu	nd /Freundin			
•	1	äche beim Einkaufen ; in e		in since P	uabhandlung	
b)	-		1		ucilianciung,	
(c)		em Hotel - an der Rezeptio		n Arzt.		
d)	ule: 8	elefongespräch ; Einladung	g-Abendessen			21
				IZ 1	1.D. 1''1	2 hours
Guest	Lecture	es / Native Speakers Einlei	0		nd Politik	
			Total Lecture ho	ours		30 hours
	Book(s)					
		k Deutsch als Fremdsprach		ngler, Paul	Rusch, Helen Schn	ntiz, Tanja
		lett-Langenscheidt Verlag,	München : 2013			
	ence B					
	0 ,	Hartmut Aufderstrasse, Jut		-		
		e Sprachlehre für Auslände				
		A1, Hermann Funk, Chris		U,		
	<u> </u>	Aktuell-I, Maria-Rosa, Sch	noenherrTil, Max H	Iueber Ver	lag, Muenchen: 20	12
	www.goe					
		tsdeutsch.dehueber.de				
k	dett-spra	chen.de <u>www.deutschtran</u>	ing.org			
	•=					
		luation: CAT / Assignmen	-	: / FAT		
		ed by Board of Studies	04-03-2016		1	
Appro	oved by	Academic Council	No. 41	Date	17-06-2016	





Course Code	Course Title	L	Τ	Р	J	С
GER2001	Mittelstufe Deutsch	2	0	1	0	3
Pre-requisite	Grundstufe Deutsch	S	yllab	ous ve	ersio	on
			v	. 1.0		
<b>Course Objectives:</b>	· · · · · ·					
The course gives stud	lents the necessary background to:					
1. Improve the co	mmunication skills in German language					
2. Improve the li	stening and understanding capability of German FM Radio	o, and	TV I	Progr	amr	nes,
Films						
3. Build the confi	dence of the usage of German language and better understar	nding of	f the	cultu	re	
Expected Course C	utcome:					
The students will be	ible to					
1. Create proficien	cy in advanced grammar and rules					
2. Understand the	exts including scientific subjects.					
3. Create the ability	of listening and speaking in real time situations.					
4. Create the vocab	ulary in different context-based situations.					
5. Create written co	ommunication in profession life, like replying or sending E-n	nails an	d lett	ters in	1 a	
company.						
6. Cre#ate commu	nication related to simple and routine tasks.					
Module:1 Prof	iciency in Advanced Grammar				9 h	ours
Grammatik : Temp	us- Perfekt, Präteritum, Plusquamperfekt, Futur-I, Futur-II, V	Wiederl	holur	ng de	r	
Grundstufen gramr	natik					
Lernziel: Sätzeschre	iben in verschiedenen Zeiten.					
Module:2 Und						
Grammatik : Passiv	erstanding of Technical Texts				9 h	ours
1	erstanding of Technical Texts , Personalpronomen (Nominativ, Akkusativ, Dativ)				9 h	ours
Lernziel: Passiv, Fo	6				9 h	ours
	, Personalpronomen (Nominativ, Akkusativ, Dativ)				9 h	ours
	, Personalpronomen (Nominativ, Akkusativ, Dativ)					ours
Module:3 Und Adjektivdeklination	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv	v Sätze				
Module:3 Und Adjektivdeklination	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts	v Sätze				
Module:3 Und Adjektivdeklination	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv	v Sätze				
Module:3UndAdjektivdeklinationLernziel: VerbindurModule:4Con	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitir g zwischen Adjektiv beim Nomen				9 h 8 h	
Module:3UndAdjektivdeklinationLernziel: VerbindurModule:4ComÜbersetzung :Techn	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infiniti ag zwischen Adjektiv beim Nomen municating in Real Time Situations nische Terminologie, wissenschaftliche, literarische Texte aus			cheni	9 h 8 h	ours
Module:3UndAdjektivdeklinationLernziel: VerbindurModule:4Con	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infiniti ag zwischen Adjektiv beim Nomen municating in Real Time Situations nische Terminologie, wissenschaftliche, literarische Texte aus			cheni	9 h 8 h	ours
Module:3UndAdjektivdeklinationLernziel: VerbindurModule:4ConÜbersetzung :TechnEnglische und umg	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infiniti ag zwischen Adjektiv beim Nomen municating in Real Time Situations nische Terminologie, wissenschaftliche, literarische Texte aus			cheni	9 h 8 h	ours
Module:3UndAdjektivdeklinationLernziel: VerbindurModule:4ConÜbersetzung :TechnEnglische und umg	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations hische Terminologie, wissenschaftliche, literarische Texte aus ekehrt,			cheni	9 h 8 h	ours
Module:3UndAdjektivdeklinationLernziel: VerbindurModule:4ConÜbersetzung :TechnEnglische und umgLernziel : Übung vo	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations hische Terminologie, wissenschaftliche, literarische Texte aus ekehrt,			cheni	<b>9</b> h <b>8</b> h	ours
Module:3UndAdjektivdeklinationLernziel: VerbindurModule:4ComÜbersetzung : TechrEnglische und umgLernziel : Übung voModule:5Acq	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitiv g zwischen Adjektiv beim Nomen municating in Real Time Situations hische Terminologie, wissenschaftliche, literarische Texte aus ekehrt, on Grammatik und Wortschatz	dem D		cheni	<b>9</b> h <b>8</b> h	ours
Module:3UndAdjektivdeklinationLernziel: VerbindurModule:4ConÜbersetzung :TechnEnglische und umgLernziel : Übung voModule:5AcqHörverständnis dur	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitir g zwischen Adjektiv beim Nomen municating in Real Time Situations hische Terminologie, wissenschaftliche, literarische Texte aus ekehrt, en Grammatik und Wortschatz	dem D		cheni	<b>9</b> h <b>8</b> h	ours
Module:3UndAdjektivdeklinationLernziel: VerbindurModule:4ConÜbersetzung :TechnEnglische und umgLernziel : Übung voModule:5AcqHörverständnis dur	, Personalpronomen (Nominativ, Akkusativ, Dativ) rmen des Personalpronomens erstanding of Scientific texts , Nebensatz, Präpositionen mit Akkusativ und Dativ,Infinitir g zwischen Adjektiv beim Nomen municating in Real Time Situations hische Terminologie, wissenschaftliche, literarische Texte aus ekehrt, en Grammatik und Wortschatz uisition of the Vocabulary of the advanced Level ch Audioübung : Familie, Leben in Deutschland, Am Bahnh etorie, Tagesablauf in eineranderen Stadt,	dem D		cheni	<b>9</b> h <b>8</b> h	ours



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Module:6	Ability to Communicate	in Professional L	ife		9 hours
Hörverständ	nis durch Audioübung: Über	berühmte Persönli	chkeiten, F	este in Deutschland,	
Videos :Wett	er, An der Universität,ein Zi	mmer buchen, Stu	dentenlebe	n,Städteund Landesk	unde
Lernziel : Hö	prverständnis, Landeskunde				
Module:7	Ability to Communicate	in Task-based Si	tuations		7 hours
Hörverständ	nis durch Audioübung: FM F	Radio aus Deutschl	anddVideos	: Fernseher aus Deu	itschland
Lernziel : LS	RW Fähigkeiten				
	Total Lecture hours:		60	hours	
	·				
Text Book(	5)				
1. Tangram	nAktuell II, Rosa Maria Da	llapizza, Beate Bli	iggel, Max	Hueber Verlag ,Mür	nchen : 2010
Reference B	ooks				
1. Themen	Aktuell, Heiko Bock, Muelle	r Jutta, MaxHuebe	r Verla, Mı	uenchen : 2010	
2. Deutsch	Sprachlehre fuer Auslaender	r, Schulz Griesbach	, Max Hue	ber Verlag, Muench	en : 2012
3. Lagune,	Deutsch als Fremdsprache, J	utta Müller, Storz	Гhomas, H	ueber Verlag, Ismani	ng:2013
4. Studio d	A1, Hermann Funk, Christin	na Kuhn, Max Hue	rberVerlag	, München : 2011	
Mode of Eval	uation: CAT / Assignmen	t / Quiz / FAT			
Recommende	ed by Board of Studies				
Approved by	Academic Council	No.41	Date	17.06.2016	



#### VIID<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	ode	(	Course Title	2	I	.   T	Р	J	С
GRE1001	1	Μ	odern Gree	k	2	0	0	0	2
Pre-requis	site	NIL				Sylla	abus	versi	on
							v. 1	.0	
Course Obje									
1. To maste	r the Gr	ek terminology wide	ely used in th	eir subjects of	specializati	on			
2. To comm	nunicate	n Modern Greek in	their day to d	lay life					
3. To provid	de gener	l information about	Greece (e.g.	geography, we	eather, food	etc.)			
Expected Co		tcomes							
4. Students									
		ounce Greek symbol	s and words	being more c	onecione an	d confi	dent	n the	116000
	• •	cabulary derived fro		being more e	JIISCIOUS all	u com		II the	usage
		odern Greek langua		worden con	oration				
		itents from scientific	-			and w	orde	baco	mina
		amental linguistic asp					-		
-	-	formulate hypothese		-					
		about the evolution			uages, unde	rstandi	ng th	eimp	ortant
		en English and Gre		0 0	E 1	1 ·	.1	. ,	• 1
		portant socio-econor	mic issues in	contemporary	Europe, de	evelopii	ng the	eir apt	itude
for critica	il thinkir	·							
Module:1	Greek	Alphabet: Correct	t usage and	Pronunciat	ion of Gr	eek		4	hour
module:1	symbo	S							
		s rules of diphthon	gs: alpha-iota	a / epsilon-io	ta / omici	on-iota	/ ar	nd up	silon
Vowels and	phoneti								
Vowels and epsilon-upsilo	phoneti on; cons	rules of diphthong	rect pronunc	iation; double	consonant	s and d	igrapl	ns. Gi	ramma
Vowels and epsilon-upsile skills: correct	phoneti on; cons pronun	rules of diphthong onants and their cor- iation of the 24 Gre	rect pronunc ek letters; co	iation; double rrect pronunci	consonant ation of dip	s and d hthong	igrapl	ns. Gr raphs.	ramma
Vowels and epsilon-upsilo	phoneti on; cons pronun <b>Greeti</b>	rules of diphthong	rect pronunc ek letters; co	iation; double rrect pronunci	consonant ation of dip	s and d hthong	igrapl	ns. Gr raphs.	ramma
Vowels and epsilon-upsile skills: correct Module:2	phoneti on; cons pronun Greeti Greek	rules of diphthongonants and their corritation of the 24 Gre	rect pronunc ek letters; co oneself; Pr	iation; double rrect pronunci oper Nouns	consonant ation of dip and Pro	s and d hthong <b>per</b>	igrapl 55 dig:	ns. Gr raphs. <b>3</b>	hour
Vowels and epsilon-upsile skills: correct Module:2	phoneti on; cons pronun Greeti Greek	rules of diphthongonants and their cor- nants of the 24 Gre ngs, introducing Names	rect pronunc ek letters; co oneself; Pr	iation; double rrect pronunci oper Nouns	consonant ation of dip and Pro	s and d hthong <b>per</b>	igrapl 55 dig:	ns. Gr raphs. <b>3</b>	hour
Vowels and epsilon-upsile skills: correct Module:2 Communicativ form.	phoneti on; cons pronun Greeti Greek 7e funct	rules of diphthongonants and their cor- nants of the 24 Gre ngs, introducing Names	rect pronunc ek letters; co oneself; Pr nd informal	iation; double rrect pronunci oper Nouns greetings; int	consonant ation of dip and Pro roducing o	s and d ohthong per neself u	igrapl 55 dig 1sing	ns. Graphs. raphs. 3 affirr	hour
Vowels and epsilon-upsile skills: correct Module:2 Communicativ form.	phoneti on; cons pronun Greeti Greek Ze funct s: nomin	rules of diphthongonants and their cor- iation of the 24 Gre <b>ngs, introducing</b> <b>Names</b> ons: using formal a	rect pronunc ek letters; co oneself; Pr nd informal	iation; double rrect pronunci oper Nouns greetings; int	consonant ation of dip and Pro roducing o	s and d ohthong per neself u	igrapl 55 dig 1sing	ns. Graphs. raphs. 3 affirr	hour
Vowels and epsilon-upsile skills: correct Module:2 Communicativ form. Grammar skill μελένε (to be	phoneti on; cons pronun Greeti Greek ve funct s: nomin called).	rules of diphthongonants and their cor- iation of the 24 Gre <b>ngs, introducing</b> <b>Names</b> ons: using formal a	rect pronunc ek letters; co oneself; Pr nd informal we case (sing	iation; double rrect pronunci oper Nouns greetings; int ular), persona	consonant ation of dip and Pro roducing o l pronouns	s and d ohthong per neself u , verbs	igrapl 55 dig 1sing	ns. Graphs. raphs. 3 affirr	hour
Vowels and epsilon-upsile skills: correct Module:2 Communicativ form. Grammar skill μελένε (to be	phoneti on; cons pronun Greeti Greek ve funct s: nomin called).	rules of diphthongonants and their cor- iation of the 24 Gre <b>ngs, introducing</b> <b>Names</b> ons: using formal a ative case and vocati	rect pronunc ek letters; co oneself; Pr nd informal we case (sing	iation; double rrect pronunci oper Nouns greetings; int ular), persona	consonant ation of dip and Pro roducing o l pronouns	s and d ohthong per neself u , verbs	igrapl 55 dig 1sing	ns. Graphs. raphs. 3 affirr	hour
Vowels and epsilon-upsile skills: correct Module:2 Communicativ form. Grammar skill μελένε (to be Written comm	phoneti on; cons pronun Greeti Greek 7e funct s: nomin called). nunication	rules of diphthongonants and their cor- iation of the 24 Gre <b>ngs, introducing</b> <b>Names</b> ons: using formal a ative case and vocati n skills: introducing <b>ality and Proven</b>	rect pronunc ek letters; co oneself; Pr nd informal ve case (sing oneself usin nance	iation; double rrect pronunci oper Nouns greetings; int ular), persona	consonant ation of dip and Pro roducing o l pronouns	s and d hthong per neself u , verbs ls.	igrapl s dig sing είμαι	ns. Gr raphs. 3 affirr (to b	hour hour e) and
Vowels and epsilon-upsilo skills: correct <b>Module:2</b> Communicativ form. Grammar skill μελένε (to be Written comm <b>Module:3</b> Communicativ	phoneti on; cons pronun Greeti Greek ve funct s: nomin called). nunication Nation ve funct	rules of diphthongonants and their cor- iation of the 24 Gre <b>ags, introducing</b> <b>Names</b> ons: using formal a ative case and vocati n skills: introducing <b>ality and Proven</b> ions: providing pe	rect pronunc ek letters; co oneself; Pr nd informal we case (sing oneself usin nance rsonal detai	iation; double rrect pronunci oper Nouns greetings; int ular), persona g Greek letter ls such as na	consonant ation of dip and Pro roducing o l pronouns	s and d hthong per neself u , verbs ls.	igrapl s dig sing είμαι	ns. Gr raphs. 3 affirr (to b	hour hour e) and
Vowels and epsilon-upsilo skills: correct <b>Module:2</b> Communicativ form. Grammar skill μελένε (to be Written comm <b>Module:3</b> Communicativ	phoneti on; cons pronun Greeti Greek ve funct s: nomin called). nunication Nation ve funct	rules of diphthongonants and their cor- iation of the 24 Gre <b>ngs, introducing</b> <b>Names</b> ons: using formal a ative case and vocati n skills: introducing <b>ality and Proven</b>	rect pronunc ek letters; co oneself; Pr nd informal we case (sing oneself usin nance rsonal detai	iation; double rrect pronunci oper Nouns greetings; int ular), persona g Greek letter ls such as na	consonant ation of dip and Pro roducing o l pronouns	s and d hthong per neself u , verbs ls.	igrapl s dig sing είμαι	ns. Gr raphs. 3 affirr (to b	hour hour e) and hour
Vowels and epsilon-upsile skills: correct <b>Module:2</b> Communicativ form. Grammar skill μελένε (to be Written comm <b>Module:3</b> Communicatir number; Bein	phoneti on; cons pronun Greeti Greek ve funct s: nomin called). nunication Nation ve func g able to	rules of diphthongonants and their cor- iation of the 24 Gre <b>ags, introducing</b> <b>Names</b> ons: using formal a ative case and vocati n skills: introducing <b>ality and Proven</b> ions: providing pe	rect pronunc ek letters; co oneself; Pr nd informal we case (sing coneself using ance rsonal detai t landmarks	iation; double rrect pronunci oper Nouns greetings; int ular), persona g Greek letter ls such as na in a city.	consonant ation of dip and Pro roducing o l pronouns ationality, s	s and d phthong per neself u , verbs ls. address	igrapl s dig s dig sing είμαι and	ns. Graphs. 3 affirr (to b 5 telep	hour hour e) and hour bhone
Vowels and epsilon-upsilo skills: correct <b>Module:2</b> Communicativ form. Grammar skill μελένε (to be Written comm <b>Module:3</b> Communicativ number; Bein Grammar skill	phoneti on; cons pronun Greeti Greek ze funct s: nomin called). nunication Nation ve func g able to ls: Com	rules of diphthongonants and their cor- biation of the 24 Gre <b>ngs, introducing</b> <b>Names</b> ons: using formal a ative case and vocation n skills: introducing <b>ality and Proven</b> ions: providing pe name a few relevan	rect pronunc ek letters; co oneself; Pr nd informal we case (sing coneself usin coneself usin nance rsonal detai t landmarks ne in -oç/-ne	iation; double rrect pronunci oper Nouns greetings; int ular), persona g Greek letter ls such as na in a city. ;/-ας; feminin	consonant ation of dig and Pro roducing o l pronouns cs and word ationality, s e in -α/-η;	s and d phthong per neself u , verbs ls. address	igrapl s dig s dig sing είμαι and	ns. Graphs. 3 affirr (to b 5 telep	hour hour e) and hour bhone
Vowels and epsilon-upsile skills: correct <b>Module:2</b> Communicativ form. Grammar skill μελένε (to be Written comm <b>Module:3</b> Communicatir number; Bein Grammar skil + accusative c	phoneti on; cons pronun Greeti Greek ve funct s: nomin called). nunication ve funct g able to ls: Comi case; care	rules of diphthongonants and their cor- iation of the 24 Gre <b>ags, introducing</b> <b>Names</b> ons: using formal a ative case and vocati n skills: introducing <b>ality and Proven</b> ions: providing pe name a few relevan non nouns (masculit	rect pronunc ek letters; co oneself; Pr nd informal we case (sing coneself usin nance rsonal detai t landmarks ne in -oç/-ŋe 1 to 10; verb	iation; double rrect pronunci oper Nouns greetings; int ular), persona g Greek letter ls such as na in a city. ;/-ας; feminin o μένω (simple	consonant ation of dig and Pro roducing o l pronouns rs and word ationality, a e in $-\alpha/-\eta$ ; present).	s and d phthong per neself u , verbs ls. address neuter :	igrapl s dig using είμαι and	ns. Gr raphs. 3 affirr (to b 5 telep '-ι); α	ramma <b>hour</b> native e) and bhone $\pi \dot{o} / c$



## VIT<sup>®</sup> Vellore Institute of Technology

CURRICULUM (2022 - 2023)

Module:4	Family						5 hours
Communicat	ive functions: describing	one's family	and des	cribing	elementary	y physica	al traits
(μικρός/μεγά	άλος – μελαχρινός/ξανθός – α	ψηλός/κοντός)					
	lls: possessive pronouns (sin			nt			
	munication skills: describing	e 1 /					
	0	,	5				
Module:5	In the classroom: in nationality adjectives	troducing	others,	langua	ges and		4 hours
Ccommunica	tive functions: introducing	others by pr	oviding in	formatio	on on thei	r nationa	lity and
spoken langu	age(s); naming the objects in	n a classroom.					
Grammar sk	ills: verb μιλώ (simple presen	nt); nationality	adjectives.				
Written com	munication skills: introducin	ng friends and	relatives p	roviding	g specific in	nformatio	on about
the language	they speak.						
Module:6	Months and seasons of	of the year.	days of t	he wee	k. time		4 hours
module.0	and weather	fi the year,	uays of t	ine wee	x, time		4 nours
Communicat	ive functions: defining time :	and date: talkit	ng about w	reather c	onditions		
	ive railedons. demning time	and date, tailin					
t frammar si	sills cardinal numerals f	rom 11 to	-			$n (\pi \alpha)$	$c_{-\pi \alpha \alpha}$
	xills: cardinal numerals f		100; inte	rrogativ	ve pronou		
ποιο/τι); ti	me adverbials (τώρα, σι	ήμεοα, χθες,	100; inte: αύριο, α	rrogativ φέτος 1	ve pronou τέρσι, του	οχοόνου,	πότε);
ποιο/τι); tii syntax: υπ	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί	ήμεοα, χθες,	100; inte: αύριο, α	rrogativ φέτος 1	ve pronou τέρσι, του	οχοόνου,	πότε);
ποιο/τι); tii syntax: υπ	me adverbials (τώρα, σι	ήμεοα, χθες,	100; inte: αύριο, α	rrogativ φέτος 1	ve pronou τέρσι, του	οχοόνου,	πότε);
ποιο/τι); tii syntax: υπ	me adverbials (τώρα, σι οκείμενο/άμεσο αντικεί efining time and date.	ήμεοα, χθες,	100; inte: αύοιο, α communio	rrogativ φέτος 1	ve pronou τέρσι, του	οχοόνου,	πότε); weather
ποιο/τι); ti syntax: υπ conditions, d Module:7	me adverbials (τώρα, σι οκείμενο/άμεσο αντικεί efining time and date.	ήμεοα, χθες, μενοWritten Daily routin	100; inte αύριο, α communio e	rrogativ φέτος τ cation	ve pronou τέοσι, τοι skills: des	οχοόνου, scribing	πότε); weather <b>3 hours</b>
ποιο/τι); ti syntax: υπ conditions, d Module:7 Module cont	me adverbials (τώρα, ση οκείμενο/άμεσο αντικεί efining time and date. ] ent: communicative function	ήμεοα, χθες, μενοWritten Daily routin as: describing o	100; inte αύοιο, α communio e one's daily	rrogativ φέτος τ cation	ve pronou τέρσι, του skills: des	οχοόνου, scribing es/hobbid	πότε); weather <b>3 hours</b> es.
ποιο/τι); ti syntax: υπ conditions, d <b>Module:7</b> Module cont Grammar sk	ne adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. 1 ent: communicative function ills: verbs πάω, ακούω, λέω	ήμερα, χθες, μενοWritten Daily routin as: describing c ο, τρώω, μπορ	100; inte αύ ειο, α communio e one's daily ώ (simple	rrogativ φέτος τ cation routine τ	ve pronou τέοσι, του skills: des and activitie ); plural no	oχϱόνου, acribing es/hobbid ouns (nor	πότε); weather <b>3 hours</b> es.
ποιο/τι); ti syntax: υπ conditions, d <b>Module:7</b> Module cont Grammar sk	me adverbials (τώρα, ση οκείμενο/άμεσο αντικεί efining time and date. ] ent: communicative function	ήμερα, χθες, μενοWritten Daily routin as: describing c ο, τρώω, μπορ	100; inte αύ ειο, α communio e one's daily ώ (simple	rrogativ φέτος τ cation routine τ	ve pronou τέοσι, του skills: des and activitie ); plural no	oχϱόνου, acribing es/hobbid ouns (nor	πότε); weather <b>3 hours</b> es.
ποιο/τι); ti syntax: υπ conditions, d <b>Module:7</b> Module cont Grammar sk	ne adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. 1 ent: communicative function ills: verbs πάω, ακούω, λέω	ήμερα, χθες, μενοWritten Daily routin as: describing o , τρώω, μπορ ing a simple let	100; inte αύ ειο, α communio e one's daily ώ (simple	rrogativ φέτος τ cation routine τ	ve pronou τέοσι, του skills: des and activitie ); plural no	oχϱόνου, acribing es/hobbid ouns (nor	πότε); weather <b>3 hours</b> es. minative
ποιο/τι); ti syntax: υπ conditions, d Module:7 Module cont Grammar sk case). Writte: Module:8	ne adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. 1 ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi	ήμερα, χθες, μενοWritten Daily routin hs: describing o h, τρώω, μπορ ing a simple let ary issues:	100; inte αύφιο, α communio e one's daily ώ (simple cter describ	rrogativ φέτος τ cation routine a present ping a da	re pronou τέοσι, του skills: des and activitie ); plural no ily routine.	oχϱόνου, acribing es/hobbid ouns (nor	πότε); weather <b>3 hours</b> es. minative <b>2 hours</b>
ποιο/τι); ti syntax: υπ conditions, d Module:7 Module cont Grammar sk case). Writte: Module:8	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi Contempora conomic aspects of the 2009-	ήμερα, χθες, μενοWritten Daily routin hs: describing o h, τρώω, μπορ ing a simple let ary issues:	100; inte αύφιο, α communio e one's daily ώ (simple cter describ	rrogativ φέτος τ cation routine a present ping a da	re pronou τέοσι, του skills: des and activitie ); plural no ily routine.	oχϱόνου, acribing es/hobbid ouns (nor	πότε); weather <b>3 hours</b> es. minative <b>2 hours</b>
ποιο/τι); ti syntax: υπ conditions, d Module:7 Module cont Grammar sk case). Writte Module:8 Social and Ed	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi Contempora conomic aspects of the 2009-	ήμερα, χθες, μενοWritten Daily routin hs: describing o h, τρώω, μπορ ing a simple let ary issues:	100; inter αύ οιο, α communio e one's daily r ώ (simple ter describ	rrogativ φέτος τ cation routine τ present bing a da t-debt cr	re pronou τέοσι, του skills: des and activitie ); plural no ily routine.	oχϱόνου, acribing es/hobbid ouns (nor	πότε); weather <b>3 hour</b> es. minative <b>2 hour</b> 2018
ποιο/τι); ti syntax: υπ conditions, d Module:7 Module cont Grammar sk case). Writte Module:8 Social and Ed	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi <b>Contempora</b> conomic aspects of the 2009- efugee Crisis.	ήμερα, χθες, μενοWritten Daily routin hs: describing o h, τρώω, μπορ ing a simple let ary issues:	100; inter αύ οιο, α communio e one's daily r ώ (simple ter describ	rrogativ φέτος τ cation routine τ present bing a da t-debt cr	re pronou τέοσι, του skills: des and activitie ); plural no ily routine. isis and of	oχϱόνου, acribing es/hobbid ouns (nor	πότε); weather <b>3 hour</b> es. minative <b>2 hour</b> 2018
ποιο/τι); ti syntax: υπ conditions, d Module:7 Module cont Grammar sk case). Writte: Module:8 Social and Ed European Ro Text Book(	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi Contempora conomic aspects of the 2009- efugee Crisis.	ήμερα, χθες, μενοWritten Daily routin hs: describing of the simple lef ary issues: -2017 Greek g	100; inter αύ οιο, α communio e one's daily r ώ (simple ter describ overnment Tot	rrogativ φέτος τ cation routine a present) bing a da t-debt cr	ve pronou τέφσι, του skills: des and activitie ily routine. isis and of <b>ure hours:</b>	es/hobbie buns (nor the 2015-	πότε); weather <b>3 hours</b> es. minative <b>2 hours</b> 2018 <b>30 hours</b>
ποιο/τι); tin syntax: υπ conditions, d Module:7 Module cont Grammar sk case). Writte: Module:8 Social and Ed European Ro Text Book( 1. Maria K	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi <b>Contempora</b> conomic aspects of the 2009- efugee Crisis.	ήμεοα, χθες, μενοWritten Daily routin ns: describing of o, τοώω, μποο ing a simple let ary issues: -2017 Greek g	100; inter αύφιο, φ communio e one's daily f ώ (simple cter describ overnment Tot z, Kliksta H	rrogativ φέτος τ cation routine a present) bing a da t-debt cr	ve pronou τέφσι, του skills: des and activitie ily routine. isis and of <b>ure hours:</b>	es/hobbie buns (nor the 2015-	πότε); weather <b>3 hours</b> es. minative <b>2 hours</b> 2018 <b>30 hours</b>
ποιο/τι); tin syntax: υπ conditions, d Module:7 Module cont Grammar sk case). Writte: Module:8 Social and Ed European Ro Text Book( 1. Maria K	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. I ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi Contempora conomic aspects of the 2009- efugee Crisis. s): arakirgiou, V. Panagiotidou e Publishing, Thessaloniki &	ήμεοα, χθες, μενοWritten Daily routin ns: describing of o, τοώω, μποο ing a simple let ary issues: -2017 Greek g	100; inter αύφιο, φ communio e one's daily f ώ (simple cter describ overnment Tot z, Kliksta H	rrogativ φέτος τ cation routine a present) bing a da t-debt cr	ve pronou τέφσι, του skills: des and activitie ily routine. isis and of <b>ure hours:</b>	es/hobbie buns (nor the 2015-	πότε); weather <b>3 hour</b> es. minative <b>2 hour</b> 2018 <b>30 hour</b>
ποιο/τι); ti syntax: υπ conditions, d Module:7 Module cont Grammar sk case). Writte: Module:8 Social and Ed European Re Text Book( 1. Maria K Languag Reference F	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. I ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi Contempora conomic aspects of the 2009- efugee Crisis. s): arakirgiou, V. Panagiotidou e Publishing, Thessaloniki &	ήμεοα, χθες, μενοWritten Daily routin hs: describing of o, τοώω, μποο ing a simple let ary issues: -2017 Greek g , Jay Schwartz c Athens, 2014	100; inter αύφιο, φ communio e one's daily r ώ (simple cter describ overnment Tot c, Kliksta I	rrogativ φέτος π cation routine a present) bing a da t-debt cr tal Lectu	ve pronou τέφσι, του skills: des and activitie ); plural no ily routine. isis and of <b>ure hours:</b> (A1), Cent	er for the	πότε); weather 3 hour es. minative 2 hour 2018 30 hour e Greek
ποιο/τι); tin syntax: υπ conditions, d Module cont Grammar sk case). Writte: Module:8 Social and Ed European Re Text Book( 1. Maria K Languag Reference E 1. Maria K 2. E. Geor	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. I ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi Contempora conomic aspects of the 2009- efugee Crisis. S): arakirgiou, V. Panagiotidou e Publishing, Thessaloniki & cook(s): aliambou (Yale University, U gantzi, E. Raftopoulou, Gr	ήμερα, χθες, μενοWritten Daily routin hs: describing of the scribing of the scribing of the scribing of the scribing of the scribble of the s	100; inter αύφιο, φ communio e one's daily f ώ (simple tter describ overnment Tot tledge Mod	rrogativ φέτος τ cation routine τ present) bing a da t-debt cr tal Lectu Ellinika	re pronou τέφσι, του skills: des and activitie ); plural no ily routine. isis and of <b>ure hours:</b> (A1), Cent	es/hobbie buns (nor the 2015- er for the Routledg	πότε); weather <b>3 hours</b> es. minative <b>2 hours</b> 2018 <b>30 hours</b> e Greek ge 2015.
ποιο/τι); tin syntax: υπ conditions, d Module:7 Module cont Grammar sk case). Writter Module:8 Social and Ed European Reference E 1. Maria K Languag Reference E 1. Maria K 2. E. Geon Athens,	me adverbials (τώρα, στ οκείμενο/άμεσο αντικεί efining time and date. I ent: communicative function ills: verbs πάω, ακούω, λέω n communication skills: writi Contempora conomic aspects of the 2009- efugee Crisis. S): arakirgiou, V. Panagiotidou e Publishing, Thessaloniki & cook(s): aliambou (Yale University, U gantzi, E. Raftopoulou, Gr	ήμερα, χθες, μενοWritten Daily routin hs: describing of the scribing of the scribing of the scribing of the scribing of the scribble of the s	100; inter αύφιο, φ communio e one's daily r ώ (simple tter describ overnment Tot tledge Mod	rrogativ φέτος τ cation routine τ present) bing a da t-debt cr tal Lectu Ellinika	re pronou τέφσι, του skills: des and activitie ); plural no ily routine. isis and of <b>ure hours:</b> (A1), Cent	es/hobbie buns (nor the 2015- er for the Routledg	πότε); weather <b>3 hours</b> es. minative <b>2 hours</b> 2018 <b>30 hours</b> e Greek ge 2015.



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course Code	Course Title	L	Т	Р	J	С
JAP1001	JAPANESE FOR BEGINNERS	2	0	0	0	2
Pre-requisite	NIL		Sylla	abus	vers	sion
			V	. 1.0		
Course Objective	es:					
he course gives st	tudents the necessary background to:					
1. Develop fou	r basic skills related to reading, listening, speaking and writing Japa	anese	e lanş	guage	<b>e</b> .	
2. Instill in lear	mers an interest in Japanese language by teaching them culture an	nd ge	nera	letiqu	ıette	s.
3. Recognize, r	ead and write Hiragana and Katakana.					
Expected Course	Quitcomes:					
tudents will be ab						
	panese alphabets and greet in Japanese.					
5 1	ronouns, verbs form, adjectives and conjunctions in Japanese.					
1	ne and dates related vocabularies and express them in Japanese.					
	questions and its answers in Japanese.					
1	ne Japanese culture and etiquettes.					
	ie japanese culture and enquettes.					
Module: 1	Introduction to Japanese syllables and Greetings			41	hour	s
Introduction of	Japanese language, alphabets; Hiragana, katakana, and Kanji 1	Pron				
			unci	111011	. VO	
and consonants.						wei
and consonants.	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro					w c1
and consonants. Module: 2				reeti		
Module: 2	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns	nour	ns, G	reeti	ngs. hour	
<b>Module: 2</b> Grammar: N1 wa	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro	onour	ns, G Are a	4 Ind I	ngs. hour Dore	'S
Module: 2 Grammar: N1 wa (This, That, Ove	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro <b>Demonstrative Pronouns</b> a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So	onour	ns, G Are a , wh	4 I nd I ich)	ngs. hour Dore	'S
<b>Module: 2</b> Grammar: N1 wa (This, That, Ove	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro <b>Demonstrative Pronouns</b> a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So er there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There	onour	ns, G Are a , wh	4 I nd I ich)	ngs. hour Dore	'S
<b>Module: 2</b> Grammar: N1 wa (This, That, Ove	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro <b>Demonstrative Pronouns</b> a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Se er there, which) Kono, sono, Ano and Dono (this, that, over t	onour	ns, G Are a , wh	4 I nd I ich)	ngs. hour Dore	r <b>s</b> hira
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro <b>Demonstrative Pronouns</b> a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So er there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There	onour ore, <i>A</i> here,	Are a , wh locat	4 1 nd D ich) ion)	hour hour Nore Koc	s hir:
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro <b>Demonstrative Pronouns</b> a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So er there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There <b>Verbs and Sentence formation</b>	onour ore, <i>A</i> here,	Are a , wh locat	4 1 nd D ich) ion)	hour hour Nore Koc	s hir:
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So er there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure	onour ore, <i>A</i> here,	Are a , wh locat	4 1 nd I ich) ion) 4 1 nce (i	hour hour Nore Koc	rs hir: s ect
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) F Module: 4	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro <b>Demonstrative Pronouns</b> a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So er there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There <b>Verbs and Sentence formation</b> verbs Be verb desu Present and Present negative Basic structure Katakana-reading and writing	onour ore, <i>A</i> there, e l	Are a , wh locat	4       nd       ich)       ion)       4       1       nace       4       4	hour Nore Koc hour Subje	s hir: s ect
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) F Module: 4 Conjunction-Ya.	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro <b>Demonstrative Pronouns</b> a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So er there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There <b>Verbs and Sentence formation</b> verbs Be verb desu Present and Present negative Basic structure Katakana-reading and writing <b>Conjunction and Adjectives</b>	onour ore, A here, e1 of so	Are a Are a , wh locat enter	41       nd I       ich)       ion)       41       nce (i       41       shim	hour Nore Koc hour Subjo	rs hir: s s -
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) F Module: 4 Conjunction-Ya. Sumimasen, waka	<ul> <li>Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro</li> <li>Demonstrative Pronouns <ul> <li>a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So</li> <li>er there, which) Kono, sono, Ano and Dono (this, that, over t</li> <li>nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There</li> </ul> </li> <li>Verbs and Sentence formation <ul> <li>verbs Be verb desu Present and Present negative Basic structure</li> <li>Katakana-reading and writing</li> </ul> </li> <li>Conjunction and Adjectives <ul> <li>nado Classification of Adjectives 'T' and 'na'-ending Set phrase</li> </ul> </li> </ul>	onour ore, A here, e1 of so	Are a Are a , wh locat enter	41       nd I       ich)       ion)       41       nce (i       41       shim	hour Nore Koc hour Subjo	rs hir: s s -
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) F Module: 4 Conjunction-Ya. Sumimasen, waka	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So er there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure Katakana-reading and writing Conjunction and Adjectivesnado Classification of Adjectives 'T' and 'na'-ending Set phrase arimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Ga arimasu' for	onour ore, A here, e1 of so	Are a Are a , wh locat enter	41       nd I       ich)       ion)       41       acce (i       41       shim       ce of	hour Nore Koc hour Subjo	hira s ect-
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) H Module: 4 Conjunction-Ya. Sumimasen, waka things and non-li Module: 5	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Seer there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure Katakana-reading and writing Conjunction and Adjectivesnado Classification of Adjectives 'T' and 'na'-ending Set phrase arimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Ga arimasu' for ving things Particle- Ka, Ni, Ga	onour ore, <i>A</i> here, e l of so – Or r Exi	Are a Are a , wh locat enter negai	4 1         nd I         ich)         ion)         4 1         nnce (i         4 1         shim         cce of         4 1	hour Nore Koc hour Subjo hour iasu	s s s s s s s s s
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) H Module: 4 Conjunction-Ya. Sumimasen, waka things and non-li Module: 5 Days/ Months	Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro Demonstrative Pronouns a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, So er there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There Verbs and Sentence formation verbs Be verb desu Present and Present negative Basic structure Katakana-reading and writing Conjunction and Adjectivesnado Classification of Adjectives 'T' and 'na'-ending Set phrase arimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Ga arimasu' for ving things Particle- Ka, Ni, Ga Vocabulary and its Meaning	onour ore, <i>A</i> here, e l of so – Or r Exi	Are a Are a , wh locat enter negai	4 1         nd I         ich)         ion)         4 1         nnce (i         4 1         shim         cce of         4 1	hour Nore Koc hour Subjo hour iasu	hir: s ect s - ng
Module: 2 Grammar: N1 wa (This, That, Ove Sochira, Achira a Module: 3 Classification of Object + Verb) H Module: 4 Conjunction-Ya. Sumimasen, waka things and non-li Module: 5 Days/ Months	<ul> <li>Hiragana – writing and reading; Vocabulary: 50 Nouns and 20 pro</li> <li>Demonstrative Pronouns <ul> <li>a N2 desu, Japanese Numerals, Demonstrative pronoun - Kore, Scer there, which) Kono, sono, Ano and Dono (this, that, over t nd Dochira. this way) Koko, Soko, Asoko and Doko (Here, There</li> <li>Verbs and Sentence formation</li> <li>verbs Be verb desu Present and Present negative Basic structure Katakana-reading and writing</li> <li>Conjunction and Adjectives</li> <li>nado Classification of Adjectives T' and 'na'-ending Set phrase arimasen Particle –Wa, Particle-Ni 'Ga imasu' and 'Ga arimasu' for ving things Particle- Ka, Ni, Ga</li> </ul> </li> <li>Vocabulary and its Meaning <ul> <li>/Year/Week (Current, Previous, Next, Next to Next) ;</li> </ul> </li> </ul>	onour ore, <i>A</i> here, e l of so – Or r Exi	Are a Are a , wh locat enter negai	4       nd       ich)       ion)       4       nnce       4       shim       ce of       4       Peco	hour Nore Koc hour Subjo hour iasu	rs hira rs ect- ng rs and



Chemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Te forms, Polite form of verbs

Μ	lodule: 7	Expressing time, p	osition and di	rections		4 hours
Clas	sification of	question words (Do	ko, Dore, Don	o, Dochira); Time	expressions (Jikan),	, Number of
hou	rs, Number	of months, calendar of	of a month; Vis	it the departmental	store, railway statio	ons, Hospital
(Byo	oki), office a	nd University		-		-
N	Iodule: 8	Guest Lecture by H	Experts			2 hours
		Total Lectu	are hours			30 hours
Text	Book(s):					
1.	The Japan	Foundation (2017), M	arugoto Japanes	se Language and Cu	lture Starter A1 Co	ursebook
	For Comm	nunicative Language C	ompetences, Ne	ew Delhi: Goyal Pul	olishers (978818307	(8047)
2.	Banno, Er	i et al (2011), Genki: A	In Integrated Co	ourse in Elementary	Japanese I [Second	Edition],
2.	Japan: The	e Japan Times.				
Refe	ence Book	(s):				
1.	Japanese f	for Busy people (2011)	video CD, AJA	LT, Japan.		
2.	Carol and	Nobuo Akiyama (201	0), The Fast and	d Fun Way, New De	elhi: Barron's Public	cation
	•					
Mode	e of Evaluat	tion: CAT, Quiz and	Digital Assign	iments		
Reco	mmended l	by Board of Studies	24-10-2018			
1	and by Aa	ademic Council	No. 53	Date	13-12-2018	



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

industry-rea Expected Outco I. The students life. Module 1 Greetings and inte The Students lear Introduce someon Module 2 Basic phrases (ye week, Months of	e: the students to read and communicate in Russian in their da dy	y-to-da uage in 3 H Cyrillic ng of the 3 h	their c nours alpha e time ours	1.0 to be day-to abet.	ecome		
Course Objectiv 1. To enable industry-rea Expected Outco 1. The students life. Module 1 Greetings and inter The Students lear Introduce someon Module 2 Basic phrases (ye week, Months of	e: the students to read and communicate in Russian in their da dy me: vill be able to read and communicate the basics of Russian langu Topics roductions in Russian; Russian alphabet, writing and reading the n to: Greet each other in Russian (formal vs. informal; depending the in Russian. Read and write Cyrillic alphabet Topics s/no, gratitude, apologies, saying hello/goodbye, etc.); Number	y-to-da uage in 3 H Cyrillic ng of the 3 h	v. 2 y life their c nours alpha e time ours	1.0 to be day-to abet.	ecome		
1. To enable industry-reading industry-reading structure         Expected Outco         1. The students value         life.         Module 1         Greetings and intra         The Students lear         Introduce someon         Module 2         Basic phrases (ye week, Months of	the students to read and communicate in Russian in their datedy me: vill be able to read and communicate the basics of Russian langu Topics roductions in Russian; Russian alphabet, writing and reading the n to: Greet each other in Russian (formal vs. informal; depending the in Russian. Read and write Cyrillic alphabet Topics s/no, gratitude, apologies, saying hello/goodbye, etc.); Number	age in 3 H Cyrillic ng of the 3 h	y life their c nours alpha e time ours	to be lay-to abet.	o-day		
1. To enable industry-reading industry-reading structure         Expected Outco         1. The students value         life.         Module 1         Greetings and intra         The Students lear         Introduce someon         Module 2         Basic phrases (ye week, Months of	the students to read and communicate in Russian in their datedy me: vill be able to read and communicate the basics of Russian langu Topics roductions in Russian; Russian alphabet, writing and reading the n to: Greet each other in Russian (formal vs. informal; depending the in Russian. Read and write Cyrillic alphabet Topics s/no, gratitude, apologies, saying hello/goodbye, etc.); Number	age in 3 H Cyrillic ng of the 3 h	their c nours alpha e time ours	lay-to abet.	o-day		
1. The students v life. Module 1 Greetings and int: The Students lear Introduce someon Module 2 Basic phrases (ye week, Months of	Topics         roductions in Russian; Russian alphabet, writing and reading the         n to: Greet each other in Russian (formal vs. informal; depending         ne in Russian. Read and write Cyrillic alphabet         Topics         s/no, gratitude, apologies, saying hello/goodbye, etc.); Number	3 h	oours alpha e time ours	abet.			
Greetings and interaction of the Students lear Introduce someon Module 2 Basic phrases (ye week, Months of	roductions in Russian; Russian alphabet, writing and reading the n to: Greet each other in Russian (formal vs. informal; dependin ne in Russian. Read and write Cyrillic alphabet <b>Topics</b> s/no, gratitude, apologies, saying hello/goodbye, etc.); Numbe	Cyrillic ng of the <b>3 h</b>	alpha e time ours		ne day)		
The Students lear Introduce someon Module 2 Basic phrases (ye week, Months of	roductions in Russian; Russian alphabet, writing and reading the n to: Greet each other in Russian (formal vs. informal; dependin ne in Russian. Read and write Cyrillic alphabet <b>Topics</b> s/no, gratitude, apologies, saying hello/goodbye, etc.); Numbe	ng of the	e time		ne day)		
Introduce someon Module 2 Basic phrases (ye week, Months of	ne in Russian. Read and write Cyrillic alphabet Topics s/no, gratitude, apologies, saying hello/goodbye, etc.); Numbe	3 h	ours	e of th	ne day)		
Basic phrases (ye week, Months of	s/no, gratitude, apologies, saying hello/goodbye, etc.); Numbe						
week, Months of	s/no, gratitude, apologies, saying hello/goodbye, etc.); Numbe	ers (1-10					
	mple conversation. Know numbers, days of the week, months a						
and apartment. P The Possessive Prepositional cas	<b>Topics</b> embers and pets). Learn Russian names: last name, first name, arts of the body and health. Personal pronouns; ты vs. вы. Ask pronouns. Asking What and Who in Russian? Nominative e. The Country and Nationality. Prepositions (in/at/on/wit arance, etc.). The Students learn to: Ask questions and demo ussian.	and pat king Wl case. h etc.).	nose in Askin The	n Rus 1g W adjeo	ssian? 'here? ctives		
Module 4	Topics	4 h	ours				
Module 4Topics4 hoursShopping. Food. Clothes. Demonstrative pronouns этот and тот. Dative case of personal pronouns, impersonal constructions. Simple translation (Russian-English-Russian). The Students learn to: Do shopping. Understand a short text in Russian.							
Module 5	Topics	5 h	ours				
Module 5Topics5 hoursTravelling. At the airport. Public transportation. Directions. Weather. Form a sentence with the given word. Place the sentences into plural form. Formulate questions. The Students learn to: Formulate and answer general questions in Russian. Express sentences given in Male or Female, Ask about and find a destination.							
Module 6	Topics	3 h	011#0				



Studying and Teaching. Profession. About myself. The Students learn to: Be able to tell about themselves						
(family, univ	ersity, house, leisure, etc.)					
Module 7		Topics			4 hours	
Dialogues: a	) At the airport. b) In a caf	eteria, grocery s	tore, farmer's m	arket, etc.		
About famil	y - Between friends.					
Module 8	Guest Lectures / native	e speakers			2 hours	
			Total Lec	ture Hours	30	
Mode of Ex	valuation: CAT , Quiz an	d Digital Assig	gnments			
Approved b	y Academic Council:	No.:41	Date:	17-06-2016		



# **Specialization Elective**

# (AY 2021 - 2022)

B. Tech. Computer Science and Engineering and Business Systems

(in collaboration with TCS)

Sl.No.	Course Code	Course Title	Page No.
1.	HUM1046	Behavioral Economics	159
2.	HUM1047	Engineering Economics	161
3.	HUM1048	Industrial Psychology	163
4.	MGT3001	Business Strategy	165
5.	MGT3002	Advanced Finance	167
6.	MGT4004	Human Resource Management	169
7.	MGT4005	Computational Finance and Modelling	171



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course code	Course Title	L	T	Р	J	С
HUM1046	Behavioral Economics	3	0	0	0	3
Pre-requisite	NIL	S	Syllal	ous v	version	n
-				v.1.(	)	
<b>Course Objective</b>						
1. To impart kno	owledge on current ideas and concepts regarding decision	ı mal	king	in E	Econor	nics,
Particularly from	n a behavioral science perspective.					
2. The course will explore key departures and the consequences of behavior of firms, households and						and
other economics entities						
3. To provide an o	overview of how behavioral principles have been applied to eco	onomi	c pro	oblen	ns.	
Expected Course						
1. Identify and ev	aluate evidence for systematic departures of economic behavior	or from	m th	e Pre	diction	ns of
the neoclassical	model, and psychological explanations for these anomalies.					
2. Incorporate p	sychologically motivated assumptions into economic me	odels	and	int	erpret	the
implications of	these assumptions.					
3. Explain how t	nese models change the predictions for equilibrium behavior	and	welfa	are a	nalysis	and
assess the impl	cations for optimal policy.					
4. Compare the	predictions of neoclassical and behavioral models and evalu	iate tl	he b	est n	nethod	l for
approaching a g	given topic.					
5. Apply Behavior	ral principles in economic problems.					
Module:1 Intr	oduction				6 h	ours
The neoclassical/s	tandard model and behavioral economics in contrast; historic	al bac	kgro	und;	behav	rioral
economics and or	her social sciences; theory and evidence in the social sc	iences	and	l in	behav	rioral
economics; applica	tions – gains and losses, money illusion, charitable donation.					
Module:2 Bas	ics of Choice Theory				6 h	ours
Revisiting the neod	classical model; utility in economics and psychology; models	of rati	onal	ity; c	onnec	tions
with evolutionary	biology and cognitive neuroscience; policy analysis - cor	isump	tion	and	addic	tion,
environmental pro-	ection, retail therapy; applications – pricing, valuation, public §	goods,	, cho	ice ai	nomali	es.
Module:3 Beli	efs, Heuristics and Biases				6 h	ours
Revisiting rationali	y; causal aspects of irrationality; different kinds of biases and	beliefs	s; self	eval	luation	and
self-projection; inc	consistent and biased beliefs; probability estimation; trading	g app	licati	ons	– trac	le in
	financial trading behavior, trade in memorabilia.					
Module:4 Cho	ice under Uncertainty				6 h	ours
	pected utility theory; prospect theory and other theories; refer	ence	ooint	s; los		
	ecision and probability weighting; applications - ownership					
consumption, perfe						
	-					
Module:5 Inte	rtemporal Choice				6 h	ours
Geometric discou	nting; preferences over time; anomalies of inter-tempor	ral de	ecisic	ons;	hyper	bolic
						_
					159	
					100	



### VIT® Vellore Institute of Technology

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Total Lecture hours:

discounting; instantaneous utility; alternative concepts – future projection, mental accounts, heterogeneous selves, procedural choice; policy analysis – mobile calls, credit cards, organization of government; applications – consumption and savings, clubs and membership, consumption planning.

#### Module:6 Game and Strategy Behavior

Review of game theory and Nash equilibrium – strategies, information, equilibrium in pure and mixed strategies, iterated games, bargaining, signaling, learning; applications – competitive sports, bargaining and negotiation, monopoly and market entry.

#### Module:7 Social Preference

Individual preferences; choice anomalies and inconsistencies; social preferences; altruism; fairness; reciprocity; trust; learning; communication; intention; demographic and cultural aspects; social norms; compliance and punishment; inequity aversion; policy analysis – norms and markets, labor markets, market clearing, public goods; applications – logic and knowledge, voluntary contribution, compensation design.

Module:8	Contemporary Issues	2 hours
Guest lecture	s by Industrial Experts.	

#### Text Book(s)

1. N. Wilkinson and M. Klaes, "An Introduction to Behavioral Economics", 2017, 3rd Edition, Red Globe Press.

#### **Reference Books**

1.	Bazerman, Max and Don Moore. Judgment in Managerial Decision Making, 2012. 8th Edition, John
	Wiley & Sons.

2. Kahneman, Daniel. Thinking, Fast and Slow, 2011, New York: Farrar, Straus and Giroux.

## Mode of Evaluation: CAT / Written assignment / Quiz / FAT

<b>Recommended by Board of Studies</b>	22-05-2021		
Approved by Academic Council	No. 62	Date	15-07-2021

6 hours

7 hours

45 hours



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# Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

B. Tech Computer Science and Engineering and Business Systems

Course code	Course title	L	T	P J	С
HUM1047	Engineering Economics	3	0	0 0	3
Pre-requisite	NIL	Sylla	abus	versi	on
			V.	1.0	
Course Objectives:					
1. To enable students to	identify and explain economic concepts and theories related	to th	e be	haviou	ar of
0 .	kets, industry and firm structures.				
	identify the determinants of various macroeconomic aggreg				-
unemployment, inflat	ion, productivity and the major challenges associated with t	the m	leasu	remer	nt of
these aggregates.					
3. To analyse cost/rever	nue data and carry out economic analyses to justify or reject a	altern	ative	es/pro	jects
on an economic basis.					
Expected Course Outco	omes:				
0					
	•				
_	neral principles of consumption function and how an econ	lomy	funo	ctions	in a
0					
	_	ne eco	onon	ny an <mark>c</mark>	1 the
e					
		f cash	n flor	ws.	
6. Evaluate projects using	g project appraisal techniques.				
		·			
Module:1 Introd	uction to Microeconomics			6 h	ours
<ul> <li>unemployment, inflation, productivity and the major challenges associated withese aggregates.</li> <li>To analyse cost/revenue data and carry out economic analyses to justify or reon an economic basis.</li> <li>Expected Course Outcomes:         <ul> <li>Understand the general principles of how the market economy functions</li> <li>Analyse how consumers and producers make decisions and learn about differer</li> <li>To understand the general principles of consumption function and how an global environment.</li> <li>Comprehend the ways in which the government and central bank can influer markets through fiscal and monetary policies.</li> <li>Evaluate the methods of cost estimation and to estimate present and future val.</li> <li>Evaluate projects using project appraisal techniques.</li> </ul> </li> <li>Module:1         <ul> <li>Introduction to Microeconomics</li> <li>Demand and Supply- Consumers' Behavior – Indifference Curve Analysis- Appupply Model- Taxes and Subsidies- Effects of changes in income and price.</li> </ul> </li> </ul>	g the	e De	mand	and	
Supply Model- Taxes and	Subsidies- Effects of changes in income and price.				
•					ours
	Iso-quants-Cost Minimization; Cost Curves -Total, Average a	ind M	largi	nal Co	osts -
Long Run and Short Run	Costs.				
	t Structure			6 h	ours
Equilibrium of a Firm Un	der Perfect Competition; Monopoly and Monopolistic Compe	etitior	1.		
		-			ours
	uction to Macroeconomics			6 h	
National Income and its	Components- GNP, NNP, GDP, NDP; Consumption Fu			nvestn	
National Income and its Simple Keynesian Model	Components- GNP, NNP, GDP, NDP; Consumption Fu of Income Determination and the Keynesian Multiplier; G			nvestn	
National Income and its Simple Keynesian Model	Components- GNP, NNP, GDP, NDP; Consumption Fu			nvestn	
National Income and its Simple Keynesian Model Taxes and Subsidies; Exte	Components- GNP, NNP, GDP, NDP; Consumption Fu of Income Determination and the Keynesian Multiplier; G rnal Sector -Exports and Imports;			nvestn nt Sec	tor -
National Income and itsSimple Keynesian ModelTaxes and Subsidies; ExterModule:5IS-LM	Components- GNP, NNP, GDP, NDP; Consumption Fu of Income Determination and the Keynesian Multiplier; G rnal Sector -Exports and Imports; Model and Business Cycles	overn	nmer	nvestn nt Sec 7 h	tor - ours
National Income and itsSimple Keynesian ModelTaxes and Subsidies; ExterModule:5IS-LMMoney - Definitions; Definitions; Definitions	Components- GNP, NNP, GDP, NDP; Consumption Fu of Income Determination and the Keynesian Multiplier; G rnal Sector -Exports and Imports; Model and Business Cycles mand for Money -Supply of Money - Bank's Credit Creatio	overr n Mu	lltipl	nvestn nt Sec 7 h ier; IS	tor - ours LM
National Income and itsSimple Keynesian ModelTaxes and Subsidies; ExterModule:5IS-LMMoney - Definitions; DeModel; Business Cycles and	Components- GNP, NNP, GDP, NDP; Consumption Fu of Income Determination and the Keynesian Multiplier; G rnal Sector -Exports and Imports; Model and Business Cycles	overr n Mu nd the	nmer Iltipl e Go	nvestn nt Sec 7 h ier; IS	tor - ours LM



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#### CURRICULUM (2022 - 2023)

M	odule:6	Engineering Economics	and Cost Estima	tion		6 hours
En	gineering Eco	onomics and Decision Maki	ng- Cost Concept	s- Life Cy	cle Costing - C	ost Estimation
Те	chniques - Pai	ametric and Non-Parametric	techniques.		C	
M	odule:7	Foreign Exchange Rates				6 hours
De	termination –	effects- exchange rate regim	e: fixed, flexible, fl	oating rate	s– methods of fo	oreign payments
— i:	ssues in Foreig	gn exchange reserves. Interna	tional Competitive	Bidding- I	ssues.	
Me	odule:8	Contemporary issues				2 hours
Gu	est lectures by	y Industrial Experts.				
				Total Le	cture hours:	45 hours
Te	xt Book(s)					
1.	.,	Paul.A and William Nordhau	s, "Economics", 2	$019, 20^{\text{th}}$ E	dition, McGraw	Hill Publishers,
	New Delhi.		, , ,	,		ŕ
Po	ference Bool	70				
1.		-	C Detriely Veel	ing "Eng	nooning Eastern	ar?' 2019 17th
1.		William, Elin M Wicks and	C. Patrick Koell	ing, Engi	neering Econom	iy, 2018, 17th
	,	rson Education.		T 1		
2.	Perlott, Jett	rey M, "Microeconomics", 20	19, / <sup>an</sup> Edition, Pe	arson Educ	cation.	
	ode of Evalua	ation: CAT / Assignment /	-	roject / Se	eminar	
			<b>AA AF AAAA</b>			
	commended	by Board of Studies	22-05-2021			



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

	ode		Course Title		L	T P	J C
HUM104	18	I	ndustrial Psychology	,	3	0 0	0 3
Pre-requisite		NIL			S	yllabus <sup>•</sup>	version
						v.1.	0
Course Objectiv							
			of industrial psycholog				
	-	-	sues. Acquiring knowle				
analysis, recru	iitment and	selection, trainir	ng, performance appra	isal and discipli	ne, er	nployee r	notivation,
and workplace	-						
3. Using an app	olied approa	ach, this course	will help prepare stu	dents for their	roles	as emp	loyees and
managers.							
Expected Cours				1 1 5 1		<i>/:</i>	
			content areas of Ind	-			-
		employment law	, training, performan	ce managemen	t, and	health/	well-being
issues in the v	1 ,						
			cepts in the context of	01	nel de	ecisions to	o reintorce
		1	ent introductory statisti				
-	-		a series of hands-on j	projects involvi	ng jo	b analysis	s, selection
	01 0	ams, and employ	0				- ·
		-	d measurements so th	at you can coll	ect a	ccurate in	nformation
and make sou							
-		used seminar co	ourses in Industrial/	Organizational	Psyc	hology o	or Human
Resource Mar	nagement.						
Module:1 I	Introductio	n					8 hours
			ods, Statistics, and Ev	vidence-based	Practi	ce. Intro	
, 0,			ob Analysis & Com				
			l-Being, Recruitment.	1 5	0,	5	nuauon a
	0						inuation Q
	Evaluating			res			7 hours
Module:2 I		the Quality of	Performance Measures, Screening Me		e Met	hods.	
Module:2		the Quality of	Performance Measur		e Met	hods.	
Module:2 I Identifying Criter	ia & Valida	ting Tests and M	<b>Performance Measur</b> leasures, Screening Me		e Met	hods.	7 hours
Module:2IIdentifying CriterModule:3	ia & Valida Employees	ting Tests and M	Performance Measures, Screening Me Ieasures, Screening Me and Evaluation	thods, Intensiv			7 hours 5 hours
Module:2IIdentifying CriterModule:3PerformanceGotting	ia & Valida Employees	ting Tests and M	<b>Performance Measur</b> leasures, Screening Me	thods, Intensiv			7 hours 5 hours
Module:2IIdentifying CriterModule:3	ia & Valida Employees	ting Tests and M	Performance Measures, Screening Me Ieasures, Screening Me and Evaluation	thods, Intensiv			7 hours 5 hours
Module:2IIdentifying CriterModule:3PerformancePerformance.	ia & Validat E <b>mployees</b> Dals and I	ting Tests and M <b>Performance a</b> Feedback, Perfo	Performance Measur leasures, Screening Me and Evaluation ormance Coaching a	thods, Intensiv			7 hours 5 hours Employee
Module:2IIdentifying CriterModule:3PerformancePerformance.Module:4	ia & Valida Employees Dals and H	ting Tests and M Sector Performance a Feedback, Perfo Onal Fairness a	Performance Measure leasures, Screening Me and Evaluation ormance Coaching a nd Diversity Manage	nd Evaluation			7 hours 5 hours
Module:2IIdentifying CriterModule:3PerformancePerformance.Module:4	ia & Valida Employees Dals and H	ting Tests and M <b>Performance a</b> Feedback, Perfo <b>onal Fairness a</b>	Performance Measur leasures, Screening Me and Evaluation ormance Coaching a	nd Evaluation			7 hours 5 hours Employee
Module:2IIdentifying CriterModule:3PerformancePerformance.Module:4CEmployee Motivation	ia & Validat Employees Dals and F Drganisation	ting Tests and M Tests and M Performance a Feedback, Perfo onal Fairness an faction and Comm	Performance Measure leasures, Screening Me and Evaluation ormance Coaching a nd Diversity Manage mitment, Fairness and	nd Evaluation			7 hours 5 hours Employee 6 hours
Module:2IIdentifying CriterModule:3PerformancePerformance.Module:4CEmployee MotivationModule:5I	ia & Validat Employees Dals and H Drganisation Ation, Satisfa	ting Tests and M s Performance a Feedback, Perfo onal Fairness an faction and Comm	Performance Measure leasures, Screening Me and Evaluation ormance Coaching a nd Diversity Manage mitment, Fairness and cional Development	nd Evaluation			7 hours 5 hours Employee
Module:2IIdentifying CriterModule:3PerformancePerformance.Module:4CEmployee MotivationModule:5I	ia & Validat Employees Dals and H Drganisation Ation, Satisfa	ting Tests and M s Performance a Feedback, Perfo onal Fairness an faction and Comm	Performance Measure leasures, Screening Me and Evaluation ormance Coaching a nd Diversity Manage mitment, Fairness and	nd Evaluation			7 hours 5 hours Employee 6 hours
Module:2       H         Identifying Criter         Module:3       H         Performance       G         Performance.       H         Module:4       G         Employee Motivation       H         Module:5       I         Leadership, Organ       H	ia & Validat Employees Dals and H Drganisation Ation, Satisfa Leadership nizational C	ting Tests and M s Performance a Feedback, Perfo onal Fairness an faction and Comm	Performance Measure leasures, Screening Me and Evaluation ormance Coaching a nd Diversity Manage mitment, Fairness and ional Development and Development.	nd Evaluation			7 hours 5 hours Employee 6 hours





Tear	ns in Oror	anizations, The Organization	of Work Rehaviou	*		
I Cal		anizations, The Organization	of work Denaviou	1		
Mod	lule:7	Stress Management				5 hours
Stres	ss Manage	ment: Demands of Life and W	Vork			
Mod	lule:8	Contemporary issues				2 hours
		by Industry experts				
		· · ·				
			To	tal Lectur	re hours:	45 hours
Text	t Book(s)					
1.	Landy,	F. J. and Conte, J. M. Wo	rk in the 21st C	entury,201	3, 4 <sup>th</sup> Edition. (	Oxford: Blackwell
	Publishi	ng.				
2.	Aamodt	, M. Industrial/Organizatio	nal Psychology:	An Appl	ied Approach,20	015, 8 <sup>th</sup> Edition,
	Wadswo	orth Publishing Co.				
Refe	erence Bo	ooks				
1.	Miner.B	, J. Industrial-Organizational I	Psychology. 1992,	McGraw H	Hill Inc., US.	
2.	Ashwath	nappa, K. Human Resource	Management: Te	ext & Cas	es,2017,8th Editio	on, McGraw Hill
	Education	on.	_			
Mod	le of Eva	luation:CAT / Assignment	/ Quiz / FAT /	Project /	Seminar	
Rec	ommend	ed by Board of Studies	22-05-2021			
App	roved by	Academic Council	No. 62	Date	15-07-2021	



MGT300	de	Course title	L	Т	Р	J	С
1101300	1	Business Strategy	3	0	0	0	3
Pre-requisite		NIL		Syllat	ous ve	ersic	n
					v. 1.0		
Course Objec				•			
		concepts of strategic management and understand its nat	ure	in co	mpet	itive	and
institutional							
-		tic approach to see business issues comprehensively and	l us	ing o	ther	core	and
	,	nowledge for decision-making.					
3. To identify	and inte	rpret the critical challenges and opportunities before an orga	niza	ation.			
Expected Cou					1	1	1
		tal concepts of strategic management to analyze business sin	tuati	ions a	nd ap	ply	these
1		isiness problems.		-			
		damental principles of and interrelationships among busi-	ness	func	tions	suc	h as:
· 1		narketing, finance, HR and information technology					
3. Understand	the int	er-relationships of business to individuals, other organiza	ation	ns, go	vernn	nent	and
society.							
		of strategic analysis thoroughly, how they are used, and	l wł	nere t	hey f	it ir	the
managerial <sub>l</sub>	process t	o frame and implement strategies.					
	1						
Module:1		uction to Strategic Management	0				ours
-	_	: Management, Vision and Objectives, Schools of thought ir		-		-	
0.	ent, Pro	ocess, and Practice, Fit Concept and Configuration P	ersp	ective	e in	Stra	tegıc
Management							
Module:2	Tradama						
		al Englisher and of Elma Dessentining a Elmada Intellege	4	A	4.0	7 1	
Core Compete		al Environment of Firm- Recognizing a Firm's Intellect					ours
1	nce as t	he Root of Competitive Advantage, Sources of Sustained (					
1	nce as t						
Business Proce	nce as t sses and	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy				dvan	tage,
Business Proce Module:3	nce as t sses and Extern	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy	Con	npetiti	ve A	dvan 6 h	tage, ours
Business Proce Module:3 Five Forces of	nce as t sses and Extern	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy	Con	npetiti	ve A	dvan 6 h	tage, ours
Business Proce Module:3	nce as t sses and Extern	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy	Con	npetiti	ve A	dvan 6 h	tage, ours
Business Proce Module:3 Five Forces of Life Cycle	nce as t sses and Extern Industry	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Strategy	Con	npetiti	ve A	dvan <u>6 h</u> Ind	tage, ours ustry
Business Proce Module:3 Five Forces of Life Cycle Module:4	nce as t sses and Exten Industry Gener	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Strategy ic strategies	Con	npetiti	ve A	dvan <u>6 h</u> Ind	tage, ours
Business Proce Module:3 Five Forces of Life Cycle Module:4	nce as t sses and Exten Industry Gener	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Strategy	Con	npetiti	ve A	dvan <u>6 h</u> Ind	tage, ours ustry
Business Proce Module:3 Five Forces of Life Cycle Module:4	nce as t sses and Extern Industry Gener gies, Ger	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Strategy ic strategies	Con	npetiti	ve A	dvan <u>6 h</u> Ind 5 h	tage, ours ustry
Business Proce Module:3 Five Forces of Life Cycle Module:4 Generic Strates Module:5	nce as t sses and Extern Industry des, Ger Corpo	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Strategy ic strategies heric Strategies and the Value Chain	Com	roups	ve Ad	dvan 6 h Ind 5 h	ours ours ustry ours
Business Proce Module:3 Five Forces of Life Cycle Module:4 Generic Strates Module:5	nce as t sses and Extern Industry des, Ger Corpo	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Strateg ic strategies eric Strategies and the Value Chain rate Strategy, and Growth Strategies	Com	roups	ve Ad	dvan 6 h Ind 5 h	ours ours ustry ours
Business Proce Module:3 Five Forces of Life Cycle Module:4 Generic Strates Module:5 The Motive fo Module:6	nce as t sses and Extern Industry Gener gies, Ger Corpo r Divers	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Stratege ic strategies heric Strategies and the Value Chain rate Strategy, and Growth Strategies lification, Related and Unrelated Diversification, Business Po sting with competitors in overseas markets	ic G	roups lio Ar	ve Ao	dvan 6 h Ind 5 h 6 h	ours ours ours ours ours
Business Proce Module:3 Five Forces of Life Cycle Module:4 Generic Strates Module:5 The Motive fo Module:6 Expansion, Ir	nce as t sses and Extern Industry Gener gies, Ger Corpo r Divers	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Strateg ic strategies eric Strategies and the Value Chain rate Strategy, and Growth Strategies efication, Related and Unrelated Diversification, Business Po	ic G	roups lio Ar	ve Ao	dvan 6 h Ind 5 h 6 h	ours ours ours ours ours
Business Proce Module:3 Five Forces of Life Cycle Module:4 Generic Strates Module:5 The Motive fo Module:6	nce as t sses and Extern Industry Gener gies, Ger Corpo r Divers	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Stratege ic strategies heric Strategies and the Value Chain rate Strategy, and Growth Strategies lification, Related and Unrelated Diversification, Business Po sting with competitors in overseas markets	ic G	roups lio Ar	ve Ao	dvan 6 h Ind 5 h 6 h	ours ours ours ours ours
Business Proce Module:3 Five Forces of Life Cycle Module:4 Generic Strates Module:5 The Motive fo Module:6 Expansion, Ir	Industry Gener Gen	he Root of Competitive Advantage, Sources of Sustained Capabilities-based Approach to Strategy nal Environments of Firm- Competitive Strategy Attractiveness that Shape Strategy, The concept of Stratege ic strategies heric Strategies and the Value Chain rate Strategy, and Growth Strategies lification, Related and Unrelated Diversification, Business Po sting with competitors in overseas markets	ic G	roups lio Ar	ve Ao	dvan 6 h Ind 5 h 6 h	ours ours ours ours ours





The	e 7S Framev	vork, Strategic Control and C	Corporate Governa	nce		
Mo	odule:8	Contemporary issues				2 hours
Gu	est lecture b	y Industry Experts or R&D	organization		·	
				To	tal Lecture hours:	45 hours
Te	xt Book(s)					
1.	Strategic n	nanagement of technological	innovation (2019)	, Schilling,	M. A., & Shankar, R,N	McGraw-Hill
	Education					
2.	The busin	ess of platforms: Strategy in	the age of digital	competitio	on, innovation, and p	ower (2019),
	Cusumano	, M. A., Gawer, A., & Yoffie	, D. B.,New York:	Harper Bu	isiness.	
Ret	ference Boo	oks				
1.	Dislodging	g multinationals: India's strate	egy in comparative	e perspectiv	ve (2019), Encarnation	n, D.Cornell,
	University	Press.				
2.	Dynamics	of knowledge intensive entre	preneurship: Busin	ness strateg	y and public policy (20	018),
	Malerba, F	., Caloghirou, Y., McKelvey,	M., & Radoševic,	S. (Eds.), R	loutledge.	
Mo	de of Eval	ation: CAT / Assignment	/ Quiz / FAT /	Lab		
Re	commende	d by Board of Studies	29-01-2021			
Ap	proved by A	Academic Council	No. 61	Date	18-02-2021	





ode	Course Title	L	T	Р	J	(
		-	-	-	0	
	NIL		*		rsion	
			V	7. 1.0		
	hout the decisions and decision variables involved with	th fin	ancial	ctivit	ies of	+ŀ
owieuge ai	bout the decisions and decision variables involved with					u
	tour uptation business information and application of f		al theor			
			ai theo	1y 111 (	torpo	Ľa
		π.				
rse Outco	ome:					
the studer	its about the various financial instruments and make th	nem u	ndersta	and at	oout t	ne
Dividend	decisions, is the main objective.					
ng and deci	isions involving Leasing shall make the students achiev	ve the	Organ	izatio	nal go	)a!
ium invest	ment.					
ng the stuc	lents with the corporate and financial restructuring.					
skills for i	interpretation of business information and applicat	ion o	of finar	ncial	theory	7
investment	t decisions, with special emphasis on working capital n	nanag	ement.			
basic know	wledge about the Derivatives.					
		0	1			
Divide	nd Decisions:				6 hc	u
proach, Di	ividend Relevance Model, Miller and Modigliani Mo	del, S	tability	of D	ivide	ıc
ends, Issue	e of bonus shares, Stock Split					
firm. Develop skills for interpretation business information and application of fin investment decisions, with special emphasis on working capital management Familiarizing the students with the corporate and financial restructuring.  ected Course Outcome: Informing the students about the various financial instruments and make the Corporate Dividend decisions, is the main objective. The Leasing and decisions involving Leasing shall make the students achieve with optimum investment. Familiarizing the students with the corporate and financial restructuring. Develop skills for interpretation of business information and applicatio corporate investment decisions, with special emphasis on working capital ma Giving the basic knowledge about the Derivatives.  Hule:1 Introduction ces of Funds (including regulatory framework)-Types of securities-Issuir ng of issue-Valuation of Stocks and bonds  Hule:2 Dividend Decisions:				6 hc	11	
	6				6 hc	u
ease Contr	racts				6 ho	<u>u</u>
ease Contr	racts rate Restructuring				6 hc	ou
ease Control Corpor cquisitions	racts rate Restructuring s- Types of Mergers, Evaluation of Merger Proposal	-Take	e-over-A	Amalg	6 hc	u
ease Control Corpor cquisitions	racts rate Restructuring	-Take	e-over-	Amalg	6 hc	u
cquisitions ut-Manage	racts rate Restructuring s- Types of Mergers, Evaluation of Merger Proposal	-Take	e-over-	Amalg	6 hc	0
Corpor cquisitions ut-Manage	racts rate Restructuring s- Types of Mergers, Evaluation of Merger Proposal ement buy-out-Corporate Failure and Liquidation cial Restructuring	-Take	e-over-4	Amalg	<b>6 ho</b> gamat	0
Corpor cquisitions ut-Manage	racts rate <b>Restructuring</b> s- Types of Mergers, Evaluation of Merger Proposal ement buy-out-Corporate Failure and Liquidation	-Take	e-over-4	Amalg	<b>6 ho</b> gamat	0
Corpor cquisitions ut-Manage Financ isolidation-	racts rate Restructuring s- Types of Mergers, Evaluation of Merger Proposal ement buy-out-Corporate Failure and Liquidation cial Restructuring -Cancellation of Paid-up Capital-Other Mechanisms ng Capital Management:				6 hc gamat 4 hc 11 hc	
ease Contr Corpor cquisitions ut-Manage Financ isolidation- isolidation- workir cal Plannir	racts rate Restructuring s- Types of Mergers, Evaluation of Merger Proposal ement buy-out-Corporate Failure and Liquidation cial Restructuring -Cancellation of Paid-up Capital-Other Mechanisms ng Capital Management: ng-Monitoring and Control of Working Capital-W	orkin	g Capi	ital F	6 hc gamat 4 hc 11 hc	
ease Contr Corpor cquisitions ut-Manage Financ isolidation- isolidation- workir cal Plannir	racts rate Restructuring s- Types of Mergers, Evaluation of Merger Proposal ement buy-out-Corporate Failure and Liquidation cial Restructuring -Cancellation of Paid-up Capital-Other Mechanisms ng Capital Management:	orkin	g Capi	ital F	6 hc gamat 4 hc 11 hc	
ease Contr Corpor cquisitions ut-Manage Financ isolidation- isolidation- workir cal Plannir	racts rate Restructuring s- Types of Mergers, Evaluation of Merger Proposal ement buy-out-Corporate Failure and Liquidation cial Restructuring -Cancellation of Paid-up Capital-Other Mechanisms ng Capital Management: ng-Monitoring and Control of Working Capital-W	orkin	g Capi	ital F	6 hc gamat 4 hc 11 hc	
	ives: owledge a kills for int t decisions ng the stude <b>rse Outco</b> the studer Dividend ng and dec num invest ng the stude skills for i investment basic kno <b>Introd</b> nds (inclu- Valuation	D2         Advanced Finance           NIL	D2         Advanced Finance         3           NIL	12         Advanced Finance         3         0           NIL         Syllability           ives:	12         Advanced Finance         3         0         0           NIL         Syllabus ver         v. 1.0           ives:         v. 1.0         v. 1.0           owledge about the decisions and decision variables involved with financial activit         kills for interpretation business information and application of financial theory in oral decisions, with special emphasis on working capital management.           ng the students with the corporate and financial restructuring.         rse Outcome:           the students about the various financial instruments and make them understand at Dividend decisions, is the main objective.         ng and decisions involving Leasing shall make the students achieve the Organizatio num investment.           ng the students with the corporate and financial restructuring.         skills for interpretation of business information and application of financial restructuring.           skills for interpretation of business information and application of financial restructuring.         skills for interpretation of business information and application of financial restructuring.           skills for interpretation of business.         Introduction         n           hasic knowledge about the Derivatives.         Introduction         n           Valuation of Stocks and bonds         Dividend Decisions:         proach, Dividend Relevance Model, Miller and Modigliani Model, Stability of D	12       Advanced Finance       3       0       0       0         NIL       Syllabus version         ives:       v. 1.0         owledge about the decisions and decision variables involved with financial activities of         kills for interpretation business information and application of financial theory in corport         t decisions, with special emphasis on working capital management.         ng the students with the corporate and financial restructuring.         rse Outcome:         the students about the various financial instruments and make them understand about th         Dividend decisions, is the main objective.         ng and decisions involving Leasing shall make the students achieve the Organizational genum investment.         ng the students with the corporate and financial restructuring.         skills for interpretation of business information and application of financial theory investment decisions, with special emphasis on working capital management.         basic knowledge about the Derivatives.         Introduction       4 ho         nds (including regulatory framework)-Types of securities-Issuing the capital in marf-Valuation of Stocks and bonds         Dividend Decisions:       6 ho         proach, Dividend Relevance Model, Miller and Modigliani Model, Stability of Divider





Mo	odule 7	Introduction to derivative	es			6 hours
Bas	sics of Futures	, Forwards, Options, Swaps	s-Interest rate Pay	off Diagram	ms, Pricing of	Futures, Put Call
Par	ity, Option Pr	icing using Binomial Model	and Black Scholes	Model-Us	e of Derivative	es for Risk-Return
Ma	nagement- Cre	edit Default Swaps				
Mo	odule 8	Recent Trends				2 hours
Co	ntemporary Is	sues in Finance				
				Total Le	cture Hours	45 Hours
Te	xt Books:					
1.	Brealey, Mye	rs and Allen, Principles of C	orporate Finance,	McGraw H	Iill Education (	(2018)
2.	I.M. Pandey,	Corporate Finance, Vikas P	ublishing House (2	2015)		
Mo	de of Evalua	tion: CAT / Assignment /	' Quiz / FAT			
Re	commended	by Board of Studies	29-01-2021			
Ap	proved by Ac	ademic Council	No. 61	Date	18-02-2021	



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

MGT4004	Course Title	L	T	P J	C
	Human Resource Management	3	0	0 0	-
Pre-requisite	NIL		Sylla	abus ve	ersion
				v.1.0	
Course Objective					
	basic concepts functional areas and activities of Human Resource	Man	agen	nent	
	apply HRM concepts in organisational context				
3. Understand how	V HRM activities lead to performance and sustainability of the org	anisa	tion	•	
Expected Course	Quitaomo				
<u>.</u>	basic concepts of HRM				
	HR functions and activities in organisations				
	vities with real time organisational environment.				
	oss-cultural work dynamics and HR activities.				
-	impact of HR activities on different career outcomes				
	1				
Module:1 Hu	nan Resource Management				8 hou
Human Resource	Management: Concept and Challenges, HR Philosophy, P	olicie	es, I	Procedu	ires ar
Practices.					
Module:2 Hu	nan Resource System Design				6 hou
HR Profession, a	nd HR Department, Line Management Responsibility in HRM,	Mea	isurii	ng HR,	Huma
resources account	ng and audit; Human resource information system				
	ctional Areas of HRM	1.			6 hou
	staffing, benefits, compensation, employee relations, HR co				uzation
design, training an	d development, human resource information systems (H.R.I.S.) and	nd pa	yrol	1.	
	nan Resource Planning				6 hou
Module:4   Hu	6	Succ	essi	on Plan	
	ng. Action Plans– Refention. Training. Redebloyment & Statting.				
	ng, Action Plans– Retention, Training, Redeployment & Staffing,	Succ			0
Demand Forecast		Succ			
Demand Forecast Module:5 Stra	tegic Management of Human Resources				6 hou
Demand Forecast Module:5 Stra	tegic Management of Human Resources				6 hou
Demand Forecast Module:5 Stra SHRM, relationsl	tegic Management of Human Resources				6 hou
Demand Forecast Module:5 Stra SHRM, relationsl Advantage Module:6 Ma	tegic Management of Human Resources ip between HR strategy and overall corporate strategy, HR as maging Diverse and inclusive workforce	a Fa	ctor	of Cor	6 hou npetitiv 6 hou
Demand Forecast Module:5 Stra SHRM, relationsl Advantage Module:6 Ma	tegic Management of Human Resources ip between HR strategy and overall corporate strategy, HR as	a Fa	ctor	of Cor	6 hou npetitiv 6 hou
Demand Forecast Module:5 Stra SHRM, relationsl Advantage Module:6 Ma Demographic and	tegic Management of Human Resources ip between HR strategy and overall corporate strategy, HR as maging Diverse and inclusive workforce	a Fa	ctor	of Cor	6 hou npetitiv 6 hou
Demand Forecast Module:5 Stra SHRM, relationsl Advantage Module:6 Ma Demographic and Perspectives of W	tegic Management of Human Resources         ip between HR strategy and overall corporate strategy, HR as         maging Diverse and inclusive workforce         Cultural Diversity, Global Context for Diversity Management orkforce Diversity	a Fa	ctor	of Cor	6 hou npetitir 6 hou ologicz
Demand Forecast Module:5 Stra SHRM, relationsl Advantage Module:6 Ma Demographic and Perspectives of W Module:7 Hu	tegic Management of Human Resources         ip between HR strategy and overall corporate strategy, HR as         maging Diverse and inclusive workforce         Cultural Diversity, Global Context for Diversity Management         porkforce Diversity         man Resource Management in Service Sector	a Fa nt, S	ocial	of Cor	6 hou npetitir 6 hou ologicz 5 hou
Demand Forecast Module:5 Stra SHRM, relationsl Advantage Module:6 Ma Demographic and Perspectives of W Module:7 Hu Managing the Cu	tegic Management of Human Resources         ip between HR strategy and overall corporate strategy, HR as         maging Diverse and inclusive workforce         Cultural Diversity, Global Context for Diversity Management orkforce Diversity	a Fa nt, S	ocial	of Cor Psych	6 hou npetiti 6 hou ologica 5 hou





HR I	Practices	Stressing Mainly on Performan	nce, Flexible W	Vorking Pr	actices – Imp	plications for HR
Mod	ule:8	Contemporary issues				2 hours
Expe	ert lectur	e on Recent trends				
			Tota	l Lecture	hours:	45 hours
Text	Book(s	3)				
1.	Dessle	er G, Varrkey B. Human Resou	rce Manageme	ent, 2020, 1	16 <sup>th</sup> edition. 1	Pearson Education India
Refe	rence B	ooks				
1.	Joseph	n J. Martocchio, Human Re	source Manag	gement, 20	019, 15th e	dition, Pearson Education
	Cham	paign.				
2.	Mathi	s RL, Jackson JH. Human reso	urce managem	ent, 2021,1	15th edition,	Jakarta: SalembaEmpat.
Mod	e of Eva	aluation: CAT / Assignment	/ Quiz / FA	T / Lab		
Reco	ommen	led by Board of Studies	22-05-2021			
Арри	roved by	y Academic Council	No. 62	Date	15-07-2021	



#### VIT<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Course Code	5	Course Title	L	Τ	Р	J	C
MGT4005		Computational Finance & Modeling	3	0	2	0	4
Pre-requisite	N	1IL		Syll	abus	vers	sion
					v.1	0.1	
Course Objecti	ves:						
1. To study finar	ncial dat	ta analysis and modelling					
1 1		ve finance skills, application of tools and techniques					
3. To advance kr	nowledg	ge in designing, developing and testing of computational fir	nanc	e mo	dels		
Expected Cour	se Out	come:					
1. Ability to anal	lyse fina	incial data					
2. Understand th	ie math	ematical foundations of finance					
3. Knowledge of	f financi	ial markets and instruments					
4. Understand op	ption pr	ricing models and its applications					
0	-	ging various types of financial risks					
6. Design and te	st comp	putational finance models					
Module:1	Financ	cial Markets and Instruments					7 hour
Financial Produc	cts and	Markets: Introduction to the financial markets and the pro-	oduc	ts wl	hich	are ti	raded i
them: Equities, i	ndices,	foreign exchange, and commodities. Options contracts and	d str	ategi	es fo	r spe	culatio
and hedging-an i	• . 1	ction					
und neuging un	introduc						
0 0		inancial Returns: Fat-tailed and skewed distributions, outlie	ers, s	tylize	d fac	ts.	
Statistical Analys Module:2	sis of Fi <b>Mather</b>	inancial Returns: Fat-tailed and skewed distributions, outlie matical Finance				,	
Statistical Analys Module:2	sis of Fi <b>Mather</b>	inancial Returns: Fat-tailed and skewed distributions, outlie				,	<b>7 hour</b> tions o
Statistical Analys Module:2	sis of Fin <b>Mather</b> nods rele	inancial Returns: Fat-tailed and skewed distributions, outlie matical Finance	al di	fferei	ntial	equa	tions c
Statistical Analys Module:2	sis of Fi Mather nods rele nance: et	inancial Returns: Fat-tailed and skewed distributions, outlie matical Finance evant to integration, differentiation and solving the partia	al di 5 rela	fferen	ntial , fini	equa te dif	tions o fferenc
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Mad	els- ARCH-GARCH-other advanced models. CBOE VIX and India VIX indices. Volatili ule:6 Options and applications	4 hours
	1 11	
	ication areas include the pricing of American options, pricing interest rate dependent claim	
	The use of importance sampling for Monte Carlo simulation of VaR for portfolios of opt	
	ule:7 Options and alternative models	5 hours
-	las, Hedging in incomplete markets, American Options, Exotic options, Electronic tradii	80 1
	ision Processes, High-dimensional covariance matrices, Extreme value theory, Statistical	ē
	ule:8 Contemporary Issues	2 hours
Indus	stry expert Lecture on recent trends	45.1
<u> </u>	Total Lecture Hours	45 hours
	Book(s)	.1
1.	Paul Wilmott, Paul Wilmott on Quantitative Finance, 3 Volume Set, 2013, 2 <sup>nd</sup> edition,	•
2.	JoergKienitz and Daniel Wetterau, Financial Modelling: Theory, Implementation and H	ractice with
	MATLAB, 2012, 1 <sup>st</sup> edition, Wiley Finance Series.	
	rence Books	·
1.	Dan Stefanica., A Primer for the Mathematics Of Financial Engineering, 2011, 2 <sup>nd</sup> Edit	tion FE Press,
2	New York.	. D
2.	John C. Hull and Sankarshan Basu, Options, futures & other derivatives, 2018, 10 <sup>th</sup> edit	tion, Pearson
2	India.	
3.	Tsay, Ruey S. Analysis of Financial Time Series, 2011, 3 <sup>rd</sup> edition, John Wiley & Sons.	
4.	R. Seydel: Tools for Computational Finance, 2017, 6 <sup>th</sup> edition, Springer.	
5.	David Ruppert, Statistics and Data Analysis for Financial Engineering, 2011, Springer.	
M. 1	$= \frac{2 \mathbf{E}}{2} = \frac{1}{2}	
	e of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar	
	of Experiments	
	following lab experiments could be planned on MATLAB-Computational Finance suite.	2 1
1.	Working with financial market data: data import, charting and basic analysis	2 hours
2.	Financial data: statistical analysis and simulation	2 hours
3.	Time series analysis	4 hours
4.	Volatility estimation	4 hours
5.	Option pricing models and analysis	3 hours
6.	Interest rate modelling and sensitivity analysis	3 hours
	Portfolio analysis and optimization	3 hours
7.	Risk estimation and hedging	3 hours
8.	Value at Risk (VaR) models	3 hours
8. 9.		
8.	High frequency data analysis	3 hours
8. 9.		3 hours <b>30 hours</b>
8. 9. 10.	High frequency data analysis Total Laboratory hours	
8. 9. 10.	High frequency data analysis Total Laboratory hours e of Assessments: Assessments/Midterm exam/FAT	
8. 9. 10. <b>Mod</b> Reco	High frequency data analysis Total Laboratory hours	



B. Tech Computer Science and Engineering and Business Systems

## NON-CREDIT COURSES

# (AY 2021 - 2022)

B. Tech. Computer Science and Engineering and Business Systems

(in collaboration with TCS)

Sl. No	Course Code	Course Title	Page No.
1.	CHY1002	Environmental Sciences	174
2.	ENG1000	Foundation English - I	176
3.	ENG2000	Foundation English - II	179
4.	EXC4097	Co-Extra Curricular Basket	



# VIT®

#### CURRICULUM (2022 - 2023)

Course Code	Course Title	L	Т	Р	J	C
CHY1002	Environmental Sciences	3	0	0	0	3
Pre-requisite	Chemistry of 12 <sup>th</sup> standard or equivalent	:	Syllab	us ve	ersio	n
			۲	7. 1.1		
Course Objective	es:					
1. To make stu	dents understand and appreciate the unity of life in all in	ts forms	s, their	nplic	ation	ns of
life style on t	he environment.					
2. To understar	nd the various causes for environmental degradation.					
3. To understar	nd in dividuals contribution in the environmental pollutio	n.				
4. To understar	nd the impact of pollution at the global level and also in the	he local	enviro	nme	nt.	
Expected Course	e Outcome:					
Students will be	able to					
1. Students wi	ll recognize the environmental issues in a problem	n orient	ed in	terdi	scipli	nary
perspective					1	5
2. Students will	l understand the key environmental issues, the science	behind	those	prob	lems	and
potential solu	ations.			-		
3. Students will	demonstrate the significance of biodiversity and its prese	ervation				
4. Students will	identify various environmental hazards					
5. Students will	design various methods for the conservation of resource	es				
	ll formulate action plans for sustainable alternatives d social aspects	that i	ncorpo	orate	scie	ence
•	have foundational knowledge enabling them to make so	ound life	e decis	ions	aswe	ell as
	r in an environmental profession or higher education.					
Module:1 E	Environment and Ecosystem				7 h	ours
Key environment	al problems, their basic causes and sustainable solutions.	IPAT e	quatio	n. Ec	cosys	tem
5		C 1	h Er		flou	v ir
-	ort system and ecosystem components; Food chain,	tood we	ер, сп	lergy	nov	v 11.
earth - life supp	ort system and ecosystem components; Food chain, a bgical succession- stages involved, Primary and second					

#### Module:2 Biodiversity

Importance, types, mega-biodiversity; Species interaction - Extinct, endemic, endangered and rare species; Hot-spots; GM crops- Advantages and disadvantages; Terrestrial biodiversity and Aquatic biodiversity - Significance, Threats due to natural and anthropogenic activities and Conservation methods.

Module:3	Sustaining Natural Resources and Environmental Quality	7 hours
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6 hours





B. Tech Computer Science and Engineering and Business Systems

i.	
	Environmental hazards - causes and solutions. Biological hazards - AIDS, Malaria, Chemical hazards-
	BPA, PCB, Phthalates, Mercury, Nuclear hazards- Risk and evaluation of hazards. Water footprint;
	virtual water, blue revolution. Water quality management and its conservation. Solid and hazardous
	waste – types and waste management methods.

Module:4	Energy Resources	6 hours
Renewable - N	Non renewable energy resources- Advantages and disadvantages - oil, Natural g	as,Coal,
Nuclear energ	y. Energy efficiency and renewable energy. Solar energy, Hydroelectric power,	, Ocean
thermal energy	y, Wind and geothermal energy. Energy from biomass, solar- Hydrogen revoluti	on.

#### Module:5 **Environmental Impact Assessment** Introduction to environmental impact analysis. EIA guidelines, Notification of Government ofIndia

(Environmental Protection Act - Air, water, forest and wild life). Impact assessment methodologies. Public awareness. Environmental priorities in India.

Module:6	Human Population Change and Environment	6 hours
Urban enviro	onmental problems; Consumerism and waste products; Promotion of e	economic
development	- Impact of population age structure - Women and child welfare,	Women
empowerment	t. Sustaining human societies: Economics, environment, policies and education.	

#### **Global Climatic Change and Mitigation** 5 hours Module:7 Climate disruption, Green house effect, Ozone layer depletion and Acid rain. Kyoto protocol, Carbon

credits, Carbon sequestration methods and Montreal Protocol. Role of Information technology in environment-Case Studies.

#### Module:8 **Contemporary issues:**

Guest lecture by Industry Experts or R&D organization

	Total Lecture	e hours:		45 hours
Tex	at Books			
1.	G. Tyler Miller and Scott E. Spool learning.	man (2016), Envi	conmental	Science, 15 <sup>th</sup> Edition, Cengage
2.	George Tyler Miller, Jr. and Scott S Connections and Solutions, 17 <sup>th</sup> Edit	1 ,	0	he Environment – Principles,
Ref	erence Books			
1.	David M.Hassenzahl, Mary C Environmental Science, 4thEdition	0		R.Berg (2011), Visualizing
Mo	de of evaluation: Internal Assessme	ent (CAT, Quizzes	s, Digital A	Assignments) & FAT
Rec	commended by Board of Studies	12-08-2017		
App	proved by Academic Council	No. 46	Date	24-08-2017

6 hours

2 hours



#### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

Course code	Course title	L	Т	Р	J	С
ENG1000	Foundation English - I	0	0	4	0	2
Pre-requisite	Less than 50% EPT score		Sylla	bus V	rsic	n
•			•	v. 1.	0	
Course Object	ives:					
1. To equip le	arners with English grammar and its application.					
2. To enable le	earners to comprehend simple text and train them to spea	k and v	vrite f	lawles	sly.	
3. To familiari	ze learners with MTI and ways to overcome them.					
Expected Cou	rse Outcome:					
-	e skills to communicate clearly through effective grammar	nron	inciati	011 211	d writ	ing
1	everyday conversations in English	, prom	*11CIAU	on an	u will	ung.
	ate and respond to simple questions about oneself.					
	cabulary and expressions.					
	I (Mother Tongue Influence) during usual conversation.					
Module:1	Essentials of grammar				31	Iour
	ic grammar-Parts of Speech				• -	20002
	nar worksheets on parts of speech					
Module:2	Vocabulary Building				31	Iour
Vocabulary dev	elopment; One word substitution					
Activity: Eleme	ntary vocabulary exercises					
Module:3	Applied grammar and usage				4 1	Hour
Types of senter						Iour
51	nar worksheets on types of sentences; tenses					
Module:4	Rectifying common errors in everyday conversatio	n			4 I	Iour
Detect and rect	ify common mistakes in everyday conversation		other parts of s			
Activity: Comm Colloquialism	non errors in prepositions, tenses, punctuation, spelling an	d othe	r parts	s of sp	eech;	
Module :5	Jumbled sentences				2 1	Hour
Sentence struct	ure; Jumbled words to form sentences; Jumbled sentences	s to for	m par	agrap	n/ sh	ort
story						
5101y	amble a paragraph / short story					
5						
5	Text-based Analysis				41	Hour
Activity: Unscr Module:6					4 I	Hour



### VIIT® Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Module	7 Corresponden	ce	3 Hours
Letter, I	mail, Application Writing	۲ ۵	
Activity	Compose letters; Emails,	, Leave applications	
Module	8 Listening for Une	derstanding	4 Hours
Listenin	to simple conversations	& gap fill exercises	
Activity	Simple conversations in I	Received Pronunciation using audio-visual material	s.
Module	9 Speaking to Conv	vey	6 Hours
Self-intr	duction; role-plays; Ever	yday conversations	
Activity	Identify and commun	icate characteristic attitudes, values, and talent	s; Working and
interacti	g within groups		
Module	10 Reading for deve	loping pronunciation	6 Hours
Loud re	ding with focus on pronu	unciation by watching relevant video materials	·
Activity	Practice pronunciation b	y reading aloud simple texts; Detecting syllables; V	isually connecting
to the w	ords shown in relevant vi	deos	
Module	11 Reading to Conte	emplate	4 Hours
Reading	short stories and passage	S	1
Activity	Reading and analyzing th	e author's point of view; Identifying the central ide	ea.
Module	12 Writing to Comm	nunicate	6 Hours
Paragrap	n Writing; Essay Writing;	; Short Story Writing	-
Activity	Writing paragraphs, essay	ys and short- stories	
Module			6 Hours
Describe	ng graphical illustrations;	interpreting basic charts, tables, and formats	
		ing simple graphical representations/charts in the f	orm of PPTs
Module	14 Overcoming Mot	ther Tongue Influence (MTI) in Pronunciation	5 Hours
Practicin	g common variants in pr		I
Activity	Identifying and overcom	ing mother tongue influence.	
		Total Laboratory Hours	60 Hours
Text Bo	ok / Workbook		
1. Wr	n, P.C., & Martin, H.	(2018). High School English Grammar & Con	mposition N.D.V.
		: S. Chand & Company Ltd.	I
	~ /	Bunting, J.D. (2010).Vocabulary in Use( High Inte	ermediate students
2	with answers). Cambrid		ennediate students
	,	ige Oniversity Press	
	e Books	and Davalaging Darding Chiller C. 1.1. II. II	o olta for T -
		and Developing Reading Skills: Cambridge Handbo	JOKS TOP Language
tead	ners. Cambridge Universi	ity Press.	
	0 0 15 11 1 1	C. (2014). Communication Skills for Engineers. Pea	E 1 ·



### VIIT<sup>®</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

3	Lewis	s, N. (2011).Word Power Made Ea	sy. Goyal Pub	lisher		
4	https	:/americanliterature.com/short-sho	ort-stories			
-	Tiwa	ri, A., &Kalam, A. (1999).Wings of	Fire - An Au	tobiograp	hy of Abdu	ıl Kalam. Universities
5	Press	(India) Private Limited.				
Mo	de of	Evaluation: Quizzes, Presentation	, Discussion,	Role Play	, Assignme	nts
Lis	t of C	hallenging Experiments (Indica	tive)			
	1.	Rearranging scrambled sentence	es			8 hours
	2.	Identifying errors in oral and wr	itten commur	nication		12 hours
	3.	Critically analyzing the text				8 hours
	4.	Developing passages from hint	words			8 hours
	5.	Role-plays				12 hours
	6.	Listening to a short story and ar	nalyzing it			12 hours
			Total I	Laborato	ry Hours	60 hours
Mo	de of	Evaluation: Quizzes, Presentation	on, Discussi	on, Role	Play, Assig	gnments
Rec	comm	ended by Board of Studies	08-06-2019			
App	proved	1 by Academic Council	No. 55	Date	13-06-201	9



#### VIIT<sup>89</sup> Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

#### CURRICULUM (2022 - 2023)

Course code	Course title	L	Τ	Р	J	С
ENG2000	Foundation English - II	0	0	4	0	2
Pre-requisite	51% - 70% EPT Score / Foundation English I		Sy	labu	is v	ersion
				V	r.1.0	
<b>Course Objectives</b>	S:					
1. To practice gram	mmar and vocabulary effectively					
2. To acquire prof	ficiency levels in LSRW skills in diverse social situations.					
3. To analyze info	rmation and converse effectively in technical communicat	ion.				
Expected Course	Outcome					
-	eliberate reading and writing process with proper gramma	r and y	vocal	oular	V.	
-	entence structures while Listening and Reading.	- unit	our		<i>.</i>	
-	effectively and share ideas in formal and informal situation	S.				
	cialized articles and technical instructions and write clear t		al co	rrest	ากก	dence
-	and analyze with verbal ability.	cennic		iicoj	5011	defice.
5. Ondeany timik						
Module:1	Grammatical Aspects					4 hours
Sentence Pattern, N	Indal Verbs, Concord (SVA), Conditionals, Connectives					
Activity : Workshee						
1 1 1 0			-			
Module:2	Vocabulary Enrichment					4 hour
	Vocabulary Enrichment					4 hour
Active & Passive V	ocabulary, Prefix and Suffix, High Frequency Words					4 hour
	ocabulary, Prefix and Suffix, High Frequency Words					4 hour
Active & Passive V Activity : Workshee	ocabulary, Prefix and Suffix, High Frequency Words ets, Exercises					4 hours
Active & Passive V Activity : Workshee Module:3	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English	sters-	Past	Ten	ISE ]	4 Hour
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V	ocabulary, Prefix and Suffix, High Frequency Words ets, Exercises	sters-	Past	Ten	ise ]	4 Hour
Active & Passive V Activity : Workshee <b>Module:3</b> Speech Sounds – V Plural Marker	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clu	usters-	Past	Ten	ise ]	4 Hour
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clu	usters-	Past	Ten	ise ]	4 Hour
Active & Passive V Activity : Workshee <b>Module:3</b> Speech Sounds – V Plural Marker Activity : Workshee	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clues         ets, Exercises	isters-	Past	Ten	ase ]	<b>4 Hour</b> Marker and
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V Plural Marker Activity : Workshee Module:4	Image: Construction of the second state of the second s		Past	Ten	se ]	<b>4 Hour</b> Marker and
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V Plural Marker Activity : Workshee Module:4 Tenses /SVA/Artie	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clues, Exercises         Syntactic and Semantic Errors         cles/ Prepositions/ Punctuation & Right Choice of Vocab		Past	Ten		<b>4 Hour</b> Marker and
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V Plural Marker Activity : Workshee Module:4	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clues, Exercises         Syntactic and Semantic Errors         cles/ Prepositions/ Punctuation & Right Choice of Vocab		Past	Ten	use ]	4 Hour
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V Plural Marker Activity : Workshee Module:4 Tenses /SVA/Artic Activity : Workshee	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clu         ets, Exercises         Syntactic and Semantic Errors         cles/ Prepositions/ Punctuation & Right Choice of Vocab         ets, Exercises		Past	Ten		4 Hour Marker and 2 Hour
Active & Passive V Activity : Workshee <b>Module:3</b> Speech Sounds – V Plural Marker Activity : Workshee <b>Module:4</b> Tenses /SVA/Artie Activity : Workshee <b>Module:5</b>	Image: Construction of the second state of the second s	ulary		Ten	ise ]	<b>4 Hour</b> Marker and
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V Plural Marker Activity : Workshee Module:4 Tenses /SVA/Artic Activity : Workshee Module:5 Dangling Modifier	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clu         ets, Exercises         Syntactic and Semantic Errors         cles/ Prepositions/ Punctuation & Right Choice of Vocab         ets, Exercises         Stylistic errors         s, Parallelism, Standard English, Ambiguity, Redundancy,	ulary		Ten	se ]	4 Hour Marker and 2 Hour
Active & Passive V Activity : Workshee <b>Module:3</b> Speech Sounds – V Plural Marker Activity : Workshee <b>Module:4</b> Tenses /SVA/Artie Activity : Workshee <b>Module:5</b>	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clu         ets, Exercises         Syntactic and Semantic Errors         cles/ Prepositions/ Punctuation & Right Choice of Vocab         ets, Exercises         Stylistic errors         s, Parallelism, Standard English, Ambiguity, Redundancy,	ulary		Ten	ise ]	4 Hours Marker and 2 Hours
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V Plural Marker Activity : Workshee Module:4 Tenses /SVA/Artie Activity : Workshee Module:5 Dangling Modifier Activity : Workshee	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clu         ets, Exercises         Syntactic and Semantic Errors         cles/ Prepositions/ Punctuation & Right Choice of Vocab         ets, Exercises         Stylistic errors         s, Parallelism, Standard English, Ambiguity, Redundancy,	ulary		Ten	ise ]	4 Hour Marker and 2 Hour 2 Hour
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V Plural Marker Activity : Workshee Module:4 Tenses /SVA/Artie Activity : Workshee Module:5 Dangling Modifier Activity : Workshee Module:6	Occabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clu         ets, Exercises         Syntactic and Semantic Errors         cles/ Prepositions/ Punctuation & Right Choice of Vocab         ets, Exercises         Stylistic errors         s, Parallelism, Standard English, Ambiguity, Redundancy,         ets, Exercises         Listening and Note making	ulary Brevit	y			4 Hour Marker and 2 Hour 2 Hour 6 Hour
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V Plural Marker Activity : Workshee Module:4 Tenses /SVA/Artie Activity : Workshee Module:5 Dangling Modifier Activity : Workshee Module:6 Intensive and Exte	Ocabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clu         ets, Exercises         Syntactic and Semantic Errors         cles/ Prepositions/ Punctuation & Right Choice of Vocab         ets, Exercises         Stylistic errors         s, Parallelism, Standard English, Ambiguity, Redundancy,         ets, Exercises         Listening and Note making         nsive Listening - Scenes from plays of Shakespeare (Eg:	ulary Brevit Court	y scen	e in	The	4 Hour Marker and 2 Hour 2 Hour 6 Hour
Active & Passive V Activity : Workshee Module:3 Speech Sounds – V Plural Marker Activity : Workshee Module:4 Tenses /SVA/Artie Activity : Workshee Module:5 Dangling Modifier Activity : Workshee Module:6 Intensive and Exte	ocabulary, Prefix and Suffix, High Frequency Words         ocabulary, Prefix and Suffix, High Frequency Words         ets, Exercises         Phonics in English         Vowels and Consonants – Minimal Pairs- Consonant Clu         ets, Exercises         Syntactic and Semantic Errors         cles/ Prepositions/ Punctuation & Right Choice of Vocabets, Exercises         Stylistic errors         s, Parallelism, Standard English, Ambiguity, Redundancy, ets, Exercises         Listening and Note making         nsive Listening - Scenes from plays of Shakespeare (Eg: ene in The Twelfth Night, Death of Desdemona in Othello, I	ulary Brevit Court	y scen	e in	The	4 Hour Marker and 2 Hour 2 Hour 6 Hour





Module:7	Art of Public Speaking	6 Hours
	portance of Non-verbal Communication, Technical Talks, Dynamics of I	
	ndividual & Group	Toressional
	aking; Extempore speech; Structured technical talk and Group presenta	tion
Tellvity . Ice Die	aking, Extempore speceri, structured technicai taik and Group presenta	
Module:8	Reading Comprehension Skills	4 Hours
Skimming, scan	ning, comprehensive reading, guessing words from context, u	nderstanding text
0.	ognizing argument and counter-argument; distinguishing between mai	0
-	l, fact and opinion, hypothesis versus evidence; summarizing and n	
	ions – Reading and Discussion	0,
0 4	of Newspapers Articles and Worksheets on Critical Reasoning from we	eb resources
, , , , , , , , , , , , , , , , , , , ,		
Module: 9	Creative Writing	4 Hours
Structure of an e	ssay, Developing ideas on analytical/ abstract topics	
Activity: Movie I	Review, Essay Writing on suggested Topics, Picture Descriptions	
-		
Module: 10	Verbal Aptitude	6 hours
Word Analogy, S	entence Completion using Appropriate words, Sentence Correction	
	ng the use of appropriate words and sentences through web tools.	
Module: 11	Business Correspondence	4 hours
Formal Letters- I	Format and purpose: Business Letters - Sales and complaint letter	
Activity: Letter w	riting- request for Internship, Industrial Visit and Recommendation	
-		
Module: 12	Career Development	6 hours
Telephone Etiqu	ette, Resume Preparation, Video Profile	
Activity: Prepar	ation of Video Profile	
Module: 13	Art of Technical Writing - I	4 hours
Technical Instrue	ctions, Process and Functional Description	
Activity: Writing	Technical Instructions	
Module: 14	Art of Technical Writing – II	4 hours
Format of a Rep	ort and Proposal	
Activity: Techn	ical Report Writing, Technical Proposal	
	Total Lecture hours:	60 hours
Text Book / W	orkbook	
-	umar & Pushp Lata, Communication Skills, 2 <sup>nd</sup> Edition, OUP, 2015	
, ,	Martin, High School English Grammar & Composition, Regular ed., ND	: Blackie ELT



#### VIT Vellore Institute of Technology (Deemed to be University under section 3 of UGC Act, 1956)

CURRICULUM (2022 - 2023)

	erence Books		
1	Peter Watkins, Teaching and Developing Reading Skills: Cambridge Har	ndbooks for Language	
	Teachers, Cambridge, 2018		
2	Aruna Koneru, Professional Speaking Skills, OUP, 2015.		
3	J.C.Nesfield, English Grammar English Grammar Composition and Usage, N	Macmillan. 2019.	
4	Richard Johnson-Sheehan, Technical Communication Today, 6th edition, ND: Pearson, 2017.		
5	Balasubramaniam, Textbook of English Phonetics For Indian Students, 3	Brd Edition , S. Chand	
	Publishers, 2013.		
Web	Resources		
1. <u>ht</u>	ttps://www.hitbullseye.com/Sentence-Correction-Practice.php		
2. <u>ht</u>	ttps://hitbullseye.com/Critical-Reasoning-Practice-Questions.php		
М	<b>de of Ele of i</b> one Deconstation Discoursiens Dele Discourse Assistances (EA/T)		
IVIC	ode of Evaluation: Presentation, Discussion, Role Play, Assignments, FAT		
List	of Challenging Experiments (Indicative)		
	a of Challenging Experiments (Indicative)         1. Reading and Analyzing Critical Reasoning questions	8 hours	
1		8 hours 12 hours	
1	1. Reading and Analyzing Critical Reasoning questions		
1	1. Reading and Analyzing Critical Reasoning questions         2. Listening and Interpretation of Videos	12 hours	
	1. Reading and Analyzing Critical Reasoning questions         2. Listening and Interpretation of Videos         3. Letter to the Editor	12 hours 6 hours	
	1. Reading and Analyzing Critical Reasoning questions         2. Listening and Interpretation of Videos         3. Letter to the Editor         4. Developing structured Technical Talk	12 hours 6 hours 12 hours	
	1. Reading and Analyzing Critical Reasoning questions         2. Listening and Interpretation of Videos         3. Letter to the Editor         4. Developing structured Technical Talk         5. Drafting SOP (Statement of Purpose)	12 hours6 hours12 hours10 hours	
	1. Reading and Analyzing Critical Reasoning questions         2. Listening and Interpretation of Videos         3. Letter to the Editor         4. Developing structured Technical Talk         5. Drafting SOP (Statement of Purpose)         6. Video Profile	12 hours6 hours12 hours10 hours12 hours	
	1. Reading and Analyzing Critical Reasoning questions         2. Listening and Interpretation of Videos         3. Letter to the Editor         4. Developing structured Technical Talk         5. Drafting SOP (Statement of Purpose)         6. Video Profile	12 hours6 hours12 hours10 hours12 hours	
1 2 2 2 ( 0 <b>Moc</b>	1. Reading and Analyzing Critical Reasoning questions         2. Listening and Interpretation of Videos         3. Letter to the Editor         4. Developing structured Technical Talk         5. Drafting SOP (Statement of Purpose)         6. Video Profile         Total Laboratory Hours	12 hours6 hours12 hours10 hours12 hours12 hours	