

## SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE



#### **Department of Computer Science and Engineering**

#### Minutes of 8th Board of Studies Meeting (UG)

The Eighth Board of Studies meeting of Computer Science and Engineering Department was held on 30<sup>th</sup> August 2024 at 10:00 A.M at Seminar Hall, Computer science department, Sri Manakula Vinayagar Engineering College, with Head of the Department in the Chair through online mode.

The following members were present for the BoS meeting

SI.No	Name of the Member with Designation and official Address	Responsibility in the BoS
1.	Dr.K. Premkumar, M.E., Ph.D.,	
	Professor and Head	
	Sri Manakula Vinayagar Engineering College	Chairperson
	Madagadipet, Puducherry	Oriali persori
	hodcse@smvec.ac.in	
	9842127679	
2.	Dr. M. Shanmugam, M.E.,Ph.D.,	1 * iiigaa
	Associate Professor,	
	Sri Manakula Vinayagar Engineering College	Member Secretary
	Madagadipet, Puducherry	Wember dedictary
	shanmugam.mm@smvec.ac.in	
Local Control of the	9444370963	The state of the s
3.	Dr. T. CHITHRALEKHA	* \ \ 1=0 \
	Professor,	Subject Expert
	Department of Computer Science,	(Pondicherry University
	School of Technology,	Nominee)
	Pondicherry University, Puducherry	-c
	tchithralekha.csc@pondiuni.edu.in	
4.	Dr. M. Ramakrishnan	
	Professor and Head,	-0
	School of Information Technology,	Subject Expert
	Department of Computer Applications,	(Academic Council
	Madurai Kamaraja University,	Nominee)
	Madurai.	,
	Ph:8939432261	
	Mail id: ramkrishod@gmail.com	
5.	Dr. A. Kalaivani	
	Professor,	
	Department of Information Technology,	Subject Expert
	Rajalakshmi Engineering College,	(Academic Council
	Chennai.	Nominee)
	7904977893	
	Mail: kalaivanianbarasan@rediffmail.com	
6.	Aroulvel S	Representative
	Technical leader,	from Industry
	Cisco, Bangalore	,

	aroshanm@cisco.com,	
_	9003898387	
7.	Shakin Banu. H	
	Design Engineer Specialist	B ( ) ( )
	British Telecomm	Postgraduate Alumnus
	unication, UK	(nominated by the Principal
	shakin2cse@gmail.com	8 *
	9791854301	
8.	Dr. M. Ganesan, M.E., Ph.D.,	
	Associate Professor	
	Sri Manakula Vinayagar Engineering College	Internal Member
	Madagadipet, Puducherry	1 - 1 5 - 1
	ganesan@smvec.ac.in	
	9486341535	75.00
9.	Dr. R. Ramachandiran, M.Tech., Ph.D.,	i Quantitation
	Associate Professor	
	Sri Manakula Vinayagar Engineering College	Internal Member
	Madagadipet, Puducherry	
	ramachandiran@smvec.ac.in	497
	7639031674	
10.	Dr. T. Megala, M.Tech., Ph.D.,	35 A *
	Associate Professor	62.1 (
	Sri Manakula Vinayagar Engineering College	Internal Member
	Madagadipet, Puducherry	er obta
	Email:Megalag26@gmail.com	A CONTRACTOR OF THE SECOND
	9789722271	S. Carldana, at. 3
11.	Dr. N. Pazhaniraja	Allegated Cast Class
	Associate Professor,	5.463.7096.2
	Computer Science and Engineering,	Internal Member
	Sri Manakula Vinayagar Engineering College	2 T T T T T T T T T T T T T T T T T T T
	Email:pazhaniraja.cse@smvec.ac.in	520
12.	Mr. P. Karthikeyan	' , 11
	Associate Professor,	x24*
	Computer Science and Engineering,	Internal Member
	Sri Manakula Vinayagar Engineering College	THE THE THE STATE OF
	Madagadipet,Puducherry	4 1
	Email:karthikcse@smvec.c.in	te In .
13.	Ŭ.	1 1971
13.	Assistant Professor	Internal Member
	Sri Manakula Vinayagar Engineering College	internal Member
	Email:thiyagarajan@smvec.ac.in	
14.		
1-7.	Assistant Professor	14.34
1	Sri Manakula Vinayagar Engineering College	Internal Member
	Madagadipet, Puducherry	internal Member
	IVIAUAEAUIDEL:FUUUCIIEIIV	
	The state of the s	* T <sub>1</sub>
	Email:Skumarakrishnan@smvec.acin	in the said
15.	Email:Skumarakrishnan@smvec.acin	
15.	Email:Skumarakrishnan@smvec.acin  Mrs.C.Kalpana	
15.	Email:Skumarakrishnan@smvec.acin  Mrs.C.Kalpana Assistant Professor	Internal Member
15.	Email:Skumarakrishnan@smvec.acin  Mrs.C.Kalpana	Internal Member

16. Mrs.P.Bhavani	recordencia in
Assistant Professor	1.10
Sri Manakula Vinayagar Engineering College	Internal Member
Madagadipet, Puducherry	Mer - Colors
Email:Bhavani@ smvec.ac.in	The second secon
17. Mr.D.Rajesh	And the first of
Assistant Professor	4.017
Sri Manakula Vinayagar Engineering College	Internal Member
Madagadipet, Puducherry	
Email:successraju@gmail.com	2 41 21
18. Mr.Arokiaraj Christian Hubert	7 7 7 7 7
Assistant Professor	,9.1
Sri Manakula Vinayagar Engineering College	Internal Member
Madagadipet, Puducherry	
Email:Arokiaraj@smvec.ac.in	
19. Ms.Swathilakshmi.V	
Assistant Professor	1 1 1
Sri Manakula Vinayagar Engineering College	Internal Member
Madagadipet, Puducherry	1*
Email:Swathilakshmi@gmail.com	10.1
20. Mrs.S.Subasree	
Assistant Professor	T == 1,
Sri Manakula Vinayagar Engineering College	Internal Member
Madagadipet, Puducherry	
Email:Subasree@smvec.ac.in	* 2
21. Mrs.S.Deeba	2 3 April 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Assistant Professor	
Sri Manakula Vinayagar Engineering College	Internal Member
Madagadipet, Puducherry	
Email:deebacse@smvec.ac.in	180 687
22. Mrs. R. Deepa	1 P-1 - XA96.1
Assistant Professor	, , , , , , , , , , , , , , , , , , , ,
Sri Manakula Vinayagar Engineering College	Internal Member
Madagadipet, Puducherry	1 1 1 1 1 1
Email:deepa.cse@smvec.ac.in	
23. Mrs.C.Karthika	
Assistant Professor	
Sri Manakula Vinayagar Engineering College	Internal Member
Madagadipet, Puducherry	
Email:karthikacse@smvec.ac.in	. "==1 -
24. Mr.K. Anbuthiruvarangan	
Assistant Professor	
Sri Manakula Vinayagar Engineering College	Internal Member
Madagadipet, Puducherry	
Anbuthiruvarangan.cse@smvec.ac.in	17
25. Mrs.N.Suganya	
Assistant Professor	Internal Marchar
Sri ManakulaVinayagar Engineering College	Internal Member
Madagadipet, Puducherry	ر چی اور دار را
Suganaya.cse@smvec.ac.in	804 4
26. Ms.N.Pavithra	Internal Member
Assistant Professor	

Sri Manakula Vinayagar Engineering College	
	Internal Member
Sri Manakula Vinayagar Engineering College	
hemalatha.cse@smvec.ac.in	under
Mr.S.Santhoshrajan	Internal Member
Assistant Professor	
Sri Manakula Vinayagar Engineering College	
Madagadipet, Puducherry	
santhoshrajan.cse@smvec.ac.in	
	Internal Member
A	
<b>U</b> 1	
	Internal Member
	memai wembei
	Internal Member
	William Wellinger
	Internal Member
	Internal Member
	Albania a
Assistant Trotossor, Department of Mathematics,	and the second of the second
	Mr.S.Santhoshrajan Assistant Professor Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry

Agenda of the Meeting	
Item No. : BoS/ UG/ CSE 8.1	Welcome Address and to confirm the minutes of the seventh meeting of Board of Studies held on 04.03.2024.
Item No. : BoS/ UG / CSE 8.2	To discuss and approve Curriculum for 1 to 8 semesters and syllabi of fifth and Sixth Semesters for the B.Tech Computer Science and Engineering students admitted from the academic year 2023-24 under R-2023 Regulation.  • Credit Distribution

	<ul> <li>Course structure</li> <li>Professional Core Courses</li> <li>Professional Elective Courses</li> <li>Open Elective Courses offered to other departments</li> </ul>
Item No. : BoS/ UG / CSE 8.3	To discuss the uniqueness of the Curriculum (R-2023)  • Theory cum Practical Courses  • Micro and Mini Projects  • Ability Enhancement Courses  • Skill Enhancement Courses  • Certification Courses  • Mandatory courses  • Introduction of Universal Human Values II  Sustainable Development Goals (SDG) – Equivalent courses as per NEP 2020.
Item No. : BoS/ UG / CSE 8.4	To Discuss the Honours Degree and Minor Degree-Courses, Syllabus and Credits
Item No. : BoS/ UG / CSE 8.5	To discuss and approve the Evaluation Systems for regulation R-2023.  • Mark weightage for Continuous Assessment and End Semester Examination  • Question paper pattern  • Mark requirement to pass the course
Item No. : BoS/ UG / CSE 8.6	<ul> <li>To discuss and approve the Academic Calendar for the odd semester 2024.</li> </ul>
Item No. : BoS/ UG / CSE 8.7	To apprise about the Industry Institute Interactions of the department of Computer Science and Engineering  • Guest lectures  • Internship details  • MOUs  • Industrial Visits  • Value Added Courses
Item No. : BoS/ UG / CSE 8.8	To apprise the End Semester Results of the students admitted in the Academic Year 2021-2022 (VI sem), 2022-2023 (IV sem), 2023-2027 (II sem) and to discuss about Extra-Curricular and Co-Curricular activities.
Item No. : BoS/ UG / CSE 8.9	To apprise the schedule of the End Semester Examination to be conducted in the month of May/June 2024 and to discuss and recommend the panel of examiners to the Academic Council
Item No. : BoS/ UG / CSE 8.10	Any other item with the permission of chair

#### Minutes of the Meeting

Dr. K.Premkumar, Chairperson, BoS opened the meeting by welcoming and introducing the external members, to the internal members and the meeting thereafter deliberated on agenda items that had been approved by the Chairperson.

#### Item No.: BoS/ UG/ CSE 8.1

Confirmation of minutes of 7th BoS meeting held on 04.03.2024

Chairperson, BoS, apprised the minutes of 8<sup>th</sup> BoS. Then it is confirmed that suggestion and minor revision stated at 7<sup>th</sup> BoS meeting was incorporated and mentioned below.

S. No	Regulation	Semester	Subject Name with code	Unit	Particulars
1	2023	IV	Cloud and Big Data Theory	-	This paper needs to be splitted into two courses. since the syllabus is too heavy. Therefore, the course is framed has cloud computing and moved to 5th semester as suggested by the experts
2	2023	IV	Distributed Systems	-	Distributed system Course is moved to fourth semester elective from fifth semester as suggested by experts
3	2023	VIII	Cryptography for Cybersecurity	-	This course needs to be removed from elective. since already the curriculum has similar paper Network Security and Cryptography

The above correction was incorporated and approved by BoS members in 7<sup>th</sup> BoS meeting

#### Item No.: BoS/ UG/ CSE 8.2

To discuss and approve Curriculum for 1 to 8 semesters and syllabi of Fifth and Sixth Semesters for the B.Tech Computer Science and Engineering and students admitted from the Academic year 2023-24 under R-2023 Regulation.

The B.Tech. Degree curriculum and syllabus approval of V and VI semesters under Autonomous Regulations 2023 for the B.Tech programme and the students admitted in the 2023-24 were discussed and recommended with the following modifications.

S. No	Regulation	Semester	Subject Name with code	Unit	Particulars
1	2023	V	Research Methodology U23HSTC02	-	Reconsider Syllabus for Research Methodology
2	2023	V	Cloud Computing U23CST504	III,IV	Swap Unit III -Cloud deployment tools to unit IV and Unit-IV AWS Cloud computing basics to Unit III
3	2023	V	Artificial Intelligence U23CSTC06	IV,V	Reframe unit 4 and Unit 5 and suggested to include Typical AI Syllabus
4	2023	V	Web Designing U23CSTC07		CO4, CO5 need to be revised and prerequisite to be changed

5	2023	V,VI	-	-	Text Books and Reference books of all courses need to be updated to recent edition
6	2023	V	Cloud Laboratory U23CSP503		Change exercise number 6 and 7 as to write a procedure instead of find a procedure
7	2023	V	Artificial Intelligence Laboratory U23CSPC05		Reframe Artificial Intelligence Laboratory all exercises
8	2023	V	Programming in C# U23CSE506		Practical exercises need to be added in Syllabus
9	2023	V	Cloud Tools and Techniques U23CSE508		Replace Elective Cloud Tools and Techniques with any other paper(Included Network Security U23CSE507)
10	2023	V	Front-End Development U23CSE510		Replace Elective Front-End Development and Techniques with any other paper(Included Software Project Management U23CSE509)
11	2023	V	Open source Programming for IoT U23CSE508	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Swap the elective paper Open source Programming for IoT from 6 <sup>th</sup> Semester to 5 <sup>th</sup> Semester and IoT challenges and Future from 5 <sup>th</sup> Semester to 6 <sup>th</sup> Semester
13	2023	1 <u>2</u>		-	Include Neural Computation Course in Syllabus-(Included in VII semester)
14	2023	VI	Designing and Building of Bots U23CST605	-	In Course Designing and Building of Bots include Robotic Process Automation alone
15	2023	VI	Animation and Visual Effects U23CST606	V	Reframe Unit 5 Blender
16	2023	VI	Blockchain Concepts and Applications U23CSB602	I,II	Reframe unit I and III in Blockchain Concepts and Applications
17	2023	VI	Game Design and Development U23CSE611	- -	Include unity in the Course Game Design and Development

18	2023	IV	Cyber Security Essentials U23CSH401	-	In Honours degree Swap the course Cyber Security Essentials from 5th Semester to 4th
19	2023	IV	Cryptography and data privacy U23CSH502	-	In Honour degree change the title Cryptography and data privacy to Cryptography

The above correction was incorporated and approved by BoS members in 8<sup>th</sup> BoS meeting, and the details are enclosed in Annexure - I.

#### Item No.: BoS/ UG/ CSE 8.3

To discuss the uniqueness of the Curriculum (R-2023)

- Credit Distribution
- ❖ Course structure
- Professional Core Courses
- Professional Elective Courses
- Open Elective Courses offered to other departments
- Discussed about the approval of Theory cum Practical Courses, Micro and Mini Projects, Syllabus Credits, Ability Enhancement Courses, Mandatory courses Introduction of Universal Human Values II and Sustainable Development Goals (SDG) introduced for B.Tech Computer Science and Engineering under R-2023 regulation from the Academic Year 2023 -2024 and the same is approved by BoS members.

#### Item No.: BoS/ UG/ CSE 8.4

To Discuss the Honours Degree and Minor Degree - Courses, Syllabus and Credits

 Discussed about the Honours and Minor Degree syllabus and the same was approved by BoS members. The Details are attached in Annexure-II

#### Item No.: BoS/ UG/ CSE 8.5

To discuss and approve the Evaluation Systems for regulation R-2023.

- Mark weightage for Continuous Assessment and End Semester Examination
- Question paper pattern
- Mark requirement to pass the course

Discussed about the Evaluation System and Question paper Format under R-2023 for the students admitted from the Academic Year 2023-24 and the same was approved by BoS members

#### Item No.: BoS/ UG/ CSE 8.6

To discuss and approve the Academic Calendar for the odd semester 2024

The Panel of Experts discussed and approved the calendar for the odd semester 2024

#### Item No.: BoS/ UG/ CSE 8.7

To apprise about the Industry Institute Interactions of the department of Computer Science

Department of CSE - 8th BoS Meeting

#### and Engineering

- Guest lectures
- Internship details
- MOUs
- Industrial Visits
- Value Added Courses

The Panel of Experts discussed about the Industry Institute Interactions

#### Item No.: BoS/ UG/ CSE 8.8

To apprise the End Semester Results of the students admitted in the Academic Year 2020-2021 (VI sem), 2021-2022 (IV sem), 2022-2023 (II sem) and to discuss about Extra-Curricular and Co-Curricular activities

The panel discussed about Results of II ,IV and VI semester and encouraged students to participate in Extra-Curricular and Co-Curricular activities

#### Item No.: BoS/ UG/ CSE 8.9

To apprise the schedule of the End Semester Examination to be conducted in the month of NOV / DEC 2024 and to discuss and recommend the panel of examiners to the Academic Council

The list of question paper setters and recommended to include government college faculties. The suggestion is incorporated and details are enclosed in Evaluators (given in Annexure-III)

Item No.: BoS/ UG/ CSE 8.10

Any other item with the permission of chair.

The panel discussed about bringing up new research topic in curriculum

The meeting for the above Agenda regarding B.Tech – Computer Science and Engineering was concluded by 1:00 pm with by **Dr. K.Premkumar**, Chairperson-BoS and Head of Department, Department of Computer Science and Engineering, Sri Manakula Vinayagar Engineering College.

SI.No	Name of the Member with Designation and official Address	Responsibility in the BoS	Signature
1.	Dr.K. Premkumar, M.E., Ph.D., Professor and Head Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry hodcse@smvec.ac.in 9842127679	Chairperson	d
2.	<b>Dr. M. Shanmugam, M.E.,Ph.D</b> Associate Professor, Sri Manakula Vinayagar Engineering College	Member Secretary	Ilshay

Page | 9

	Madagadipet, Puducherry		
	shanmugam.mm@smvec.ac.in 9444370963	,	
3.	Dr. T. CHITHRALEKHA Professor, Department of Computer Science, School of Technology, Pondicherry University, Puducherry tchithralekha.csc@pondiuni.edu.in	Subject Expert (Pondicherry University Nominee)	T. Thibralekha
4.	Dr. M. Ramakrishnan Professor and Head, School of Information Technology, Department of Computer Applications, Madurai Kamaraja University, Madurai. Ph:8939432261 Mail id: ramkrishod@gmail.com	Subject Expert (Academic Council Nominee)	Jan de la companya della companya della companya de la companya della companya de
5.	Dr. A. Kalaivani Professor, Department of Information Technology, Rajalakshmi Engineering College, Chennai. 7904977893 Mail: kalaivanianbarasan@rediffmail.com	Subject Expert (Academic Council Nominee)	A Calaino
6.	Aroulvel S Technical leader, Cisco,Bangalore aroshanm@cisco.com, 9003898387	Representative from Industry	DA 1-1
7.	Shakin Banu. H Design Engineer Specialist British Telecommunication, UK shakin2cse@gmail.com 9791854301	Postgraduate Alumnus (nominated by the Principal)	H. Shi
8.	Dr. M. Ganesan, M.E., Ph.D., Associate Professor Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry ganesan@smvec.ac.in 9486341535	Internal Member	m. Com
9.	Dr. R. Ramachandiran, M.Tech., Ph.D., Associate Professor Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry ramachandiran@smvec.ac.in 7639031674	Internal Member	J. Rudi

40	D. T. M. T. J. DL D	Internal Member	
10.	Dr. T. Megala, M.Tech., Ph.D.,	Internal Member	
	Associate Professor		<b>\</b>
	Sri Manakula Vinayagar Engineering		The same of the sa
	College		Mart
	Madagadipet, Puducherry		
	Email:Megalag26@gmail.com 9789722271		v* 11 .
11	Dr. N. Pazhaniraja	Internal Member	, i
11.	Associate Professor,	THOTTAL MOTIO	
	Computer Science and Engineering,		A - ILA
	Sri Manakula Vinayagar Engineering		The Mosa
	College		N
	Email:pazhaniraja.cse@smvec.ac.in		
12	Mr. P. Karthikeyan	Internal Member	
12.	Associate Professor,		
	Computer Science and Engineering,		
	Sri Manakula Vinayagar Engineering		Poc 2
	College		
	Madagadipet,Puducherry		V
	Email:karthikcse@smvec.c.in		,
13	Mr.B.Thiyagarajan	Internal Member	
13.	Assistant Professor	michial monioc.	000
	Sri Manakula Vinayagar Engineering		J. martin
	College		
	Email:thiyagarajan@smvec.ac.in		Landau de la Companya
14.	Mr.S.Kumarakrishnan	Internal Member	0 444
	Assistant Professor		a Weeks agb da
	Sri Manakula Vinayagar Engineering		Mh.
	College		
	Madagadipet,Puducherry		· · ·
	Email:Skumarakrishnan@smvec.acin		g(t)
	A 27 WILL & J		1 1
15.	Mrs.C.Kalpana	Internal Member	
	Assistant Professor	- *	
	Sri Manakula Vinayagar Engineering	1	a nulpour
	College		C. Kerlpower.
	Madagadipet,Puducherry	1	
10.00	Email:ckalpana@ smvec.ac.in		
16.	Mrs.P.Bhavani	Internal Member	
	Assistant Professor		1 21/2
	Sri Manakula Vinayagar Engineering	+	( )
	College		
	Madagadipet, Puducherry		
	Email:Bhavani@ smvec.ac.in	Internal Member	
17.	Mr.D.Rajesh	Internal Member	
	Assistant Professor		[ macel
	Sri Manakula Vinayagar Engineering	**	0-00
	College Madegadinet Budusherry		
-	Madagadipet, Puducherry	,	• 11 12 11
10	Email:successraju@gmail.com	Internal Member	
18.	Mr.Arokiaraj Christian Hubert Assistant Professor	Internal Member	Ay My
	Assistant Finesson	1	

	Sri Manakula Vinayagar Engineering	h (	
	College		. v
	Madagadipet, Puducherry		
	Email:Arokiaraj@smvec.ac.in		
19.	Ms.Swathilakshmi.V	Internal Member	-
	Assistant Professor		
	Sri Manakula Vinayagar Engineering		tros
	College		
	Madagadipet, Puducherry		,
	Email:Swathilakshmi@gmail.com		if it w
20.	Mrs.S.Subasree	Internal Member	
	Assistant Professor		
	Sri Manakula Vinayagar Engineering		
	College		19/
	Madagadipet,Puducherry		, 1
	Email:Subasree@smvec.ac.in		
21.	Mrs.S.Deeba	Internal Member	
	Assistant Professor		
	Sri Manakula Vinayagar Engineering		812
	College		
	Madagadipet,Puducherry		
•	Email:deebacse@smvec.ac.in		
22.	Mrs. R. Deepa	Internal Member	1
	Assistant Professor		
	Sri Manakula Vinayagar Engineering	,	V /4.X
	College		1
	Madagadipet, Puducherry		V
	Email:deepa.cse@smvec.ac.in		
23.	Mrs.C.Karthika	Internal Member	
	Assistant Professor		D. Ca
	Sri Manakula Vinayagar Engineering		Remund.
	College		Games.
	Madagadipet,Puducherry		
	Email:karthikacse@smvec.ac.in		
24.	Mr.K. Anbuthiruvarangan	Internal Member	
	Assistant Professor		16
	Sri Manakula Vinayagar Engineering		111
	College		
	Madagadipet, Puducherry		*
	Anbuthiruvarangan.cse@smvec.ac.in	Intone al Manakan	
25.		Internal Member	
12	Assistant Professor		
	Sri Manakula Vinayagar Engineering		M
	College		17
	Madagadipet, Puducherry		7.6.5
- 00	Suganaya.cse@smvec.ac.in	Internal Member	
26.	Ms.N.Pavithra	IIIIGITIAI WIGITIDEI	
	Assistant Professor		
	Sri Manakula Vinayagar Engineering		Chi
	College		
,	Madagadipet, Puducherry		Terror to
	Pavithra.cse@smvec.ac.in		

1		Internal Manahaw	
27.	Mrs.M.Hemalatha Assistant Professor Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry hemalatha.cse@smvec.ac.in	Internal Member	M. R.f.
28.	Mr.S.Santhoshrajan Assistant Professor Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry santhoshrajan.cse@smvec.ac.in	Internal Member	Maj
29.	Ms.V.Nivetha Assistant Professor Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry nivetha.cse@smvec.ac.in	Internal Member	Quete.
30.	Ms.A.Mohanapriya Assistant Professor Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry mohanapriya.cse@smvec.ac.in	Internal Member	Moharaprife
31.	Mrs.S.Jayalakshmi Assistant Professor Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry jayalakshmi.cse@smvec.ac.in	Internal Member	Jara
32.	Ms.A.Amala Margret Assistant Professor Sri Manakula Vinayagar Engineering College Madagadipet,Puducherry amalamargret.cse@smvec.ac.in	Internal Member	J. Smell Hargot
33.	<b>Dr.M.A.IshrathJahan</b> Associate Professor, Department of English, SMVEC	Internal Member	MA ZUNJ
34.	Dr.T.Jayavarthanan Professor, Department of Physics, SMVEC	Internal Member	1. Julialen
35.	<b>Dr.S.Savithiri</b> Professor and Head, Department of Chemistry, SMVEC	Internal Member	& Silvim

36.	Dr.K.Raja	Internal Member	1 216
	Assistant Professor, Department of		13. MM
	Mathematics, SMVEC		

Ligary Durch of



## SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

Puducherry

## B.TECH. COMPUTER SCIENCE AND ENGINEERING

ACADEMIC REGULATIONS 2023 (R - 2023)

Dr. K. PROMIKUMAR

Professor & Head

Professor Science and Enge.

Dept. of Computer Science and Enge.

Sri Manakula Vinayagar Enge.

[An Autonomous Institution]

**CURRICULUM** 



#### **COLLEGE VISION AND MISSION**

#### VISION

To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

#### MISSION

M1: Quality Education : To provide comprehensive academic system that amalgamates the cutting edge technologies with best practices.

**M2: Research and Innovation**: To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

M3: Employability and

**Entrepreneurship**: To inculcate the employability and entrepreneurial skills through value and skill based training.

M4: Ethical Values

: **To** instill deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

#### DEPARTMENT VISION AND MISSION

#### VISION

To create a productive learning and research environment for graduates to become highly dynamic, competent, ethically responsible, professionally knowledgeable in the field of computer science and engineering to meet the industrial needs on par with global standards.

#### **MISSION**

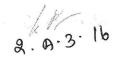
**M1: Quality Education:** Empowering the students with the necessary technical skills through quality education to grow professionally.

**M2: Innovative Research:** Advocating the innovative research ideas by incorporating with industries for developing products and services.

M3: Placement and Entrepreneurship: Advancing the education by strengthening the Industry-academic relationship through hands-on training to seek placement in the top most industries or to develop a start-ups.

**M4:** Ethics and Social Responsibilities: Stimulating professional behaviour and good ethical values to improve the leadership skills and social responsibilities.

B.Tech. Computer Science and Engineering



#### PROGRAMME OUTCOMES (POs)

#### PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

#### PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

#### PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

#### PO4: Conduct investigations of complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

#### PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

#### PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

#### PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.

#### PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

#### PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

#### PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

#### PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

#### PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

#### PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

**PEO1: Competitive Platform:** To create a competitive platform for solving critical problems in a wide variety of fields.

**PEO2: Exploration:** Enthusiastic participation in learning, understanding, designing and applying new innovative research ideas as the field evolves.

**PEO3: Career:** Applying cutting-edge technology that improves knowledge and to commit students for life-long learning to reach the leading positions in the career.

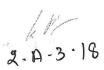
**PEO4: Professional Values:** Simulate the graduates to hold the responsibilities in the context of technology, ethics, society and humanity.

#### PROGRAM SPECIFIC OUTCOMES (PSOs)

**PSO1: Computational Skills:** Graduates with the ability to apply basic knowledge of Computer Science in solving the critical problems.

**PSO2: Studious Research:** Ability to convert innovative ideas into research or society oriented projects through current trending technologies.

**PSO3: Employability:** Acquire placement in highly reputed industries or accomplish new technical business skills with the contemporary trends in the industry.



### STRUCTURE FOR UNDERGRADUATE ENGINEERING PROGRAMME

SI. No.	Course Category	Breakdown of Credits
1	Humanities and Social Sciences including Management courses (HS)	15
2	Basic Science Courses (BS)	20
3	Engineering Science including workshop, drawing, basics of electrical / mechanical / computer etc. (ES)	18
4	Professional Core Courses (PC)	77
5	Professional Electives Courses (PE)	
6	Open Electives Courses (OE)	18
7	Project Work and Internship (PA)	9
8	Ability Enhancement Courses (AEC*)	13
9	Mandatory Courses (MC*)	_
	Total	170

### SCHEME OF CREDIT DISTRIBUTION - SUMMARY

SI. No	AICTE		Credits per Semester								
	Suggested Course Category	I	II	III	IV	V	VI	VII	VIII	Credits	
1	Humanities and Social Sciences (HS)	5	3	1	1	2	-	1	3	15	
2	Basic Sciences (BS)	4	7	5	4	-	<del>-</del>			20	
3	Engineering Sciences (ES)	9	5	_	4	-	_	- 32	_	18	
4	Professional Core (PC)	3	8	17	11	12	15	11		77	
5	Professional Electives (PE)	-	_	-	3	3	3	3	6	18	
6	Open Electives (OE)	_	-	- 1	-	3	3	3		9	
7	Project Work (PA)	-	_	_	_	1	1	2	8	12	
8	Internship (PA)	_	_	_		_		1	_	1	
9	Employability Enhancement Courses (AEC)*	-	-	-	-	-	-	-	-	-	
10	Mandatory Courses (MC)*	-	-	-	-	_	_	_	_	_	
	Total	21	23	23	23	21	22	20	17	170	

<sup>\*</sup> AEC and MC are not included for CGPA calculation

#### HONOURS DEGREE PROGRAMME:

The student is permitted to opt for earning an *honours degree* in the same discipline ofengineeringin addition to the degree in his/her own discipline. To earn an honours degree the student is required to earn an additional 18 - 20 credits (over and above the total 170 credits prescribed in the curriculum) starting from fourth semester onwards by completing 5 additional courses offered in respective semesters. A student is eligible to exercise this option if he/she has passed all the courses offered upto third semester in the first attempt itself and has earned a CGPA / GPA\* (\*for lateral entry) of not less than 8.0.The prescribed courses offered for Honours degree are given in **Annexure IV**.

B.Tech. Computer Science and Engineering

		SE	MESTER - I					Essentia de la		
SI. No. Course Code Course Title Category Periods Credits						N	/lax. Ma	rks		
Theo	)rv	odaloc Hile	Category	L	T	Р	Credits	CAM	ESM	Total
1		F	T							
- '	U23MATC01	Engineering Mathematics - I	BS	3	1	0	4	25	75	100
2	U23ESTC03	Basics of Electrical and Electronics Engineering	ES	3	0	0	3	25	75	100
3	U23CSTC01	Programming in C	ES	3	0	0	3 .	25	75	100
4	U23CSTC02	Problem Solving Approach	PC	3	0	0	3	25	75	100
5	U23HSTC01	Universal Human Values- II	HS	2	0	0	2	25	75	100
Theo	ry Cum Practica	al							10	100
6	U23ENBC01	Communicative English - I	HS	2	0	2	3	50	50	100
Pract	ical							- 00	- 50	100
7	U23ESPC01	Basics of Electrical and Electronics Engineering Laboratory	ES	0	0	2	1	50	50	100
8	U23CSPC01	Programming in C Laboratory	ES	0	0	2	1	50	50	100
9	U23ESPC03	Engineering Graphics using AutoCAD	ES	0	0	2	1	50	50	100
	y Enhancement	Course								
10	U23CSC1XX	Certification Course – I **	AEC	0	0	4	-	100		100
	atory Course									100
11	U23CSM101	Induction Programme	MC	2١	Veek	S	-	- 1	-	_
							21	425	575	1000

01		SE	MESTER - II							
SI. No.	Course Code	Course Title	Category	P	erio	ds	Cuadita	I	Max. Mar	ks
		Tourse Title	Category	L	T	P	Credits	CAM	ESM	Total
Thec		- 1 P E'						el Bita	7-1800	
1	U23MATC02	Engineering Mathematics - II	BS	3	1	0	4	25	75	100
2	U23BSTC01	Physical Science for Engineers	BS	3	0	0	3	25	75	100
3	U23ADTC01	Programming in Python	ES	3	0	0	3	25	75	100
4	U23CSTC03	Data Structures	PC	3	0	0	3	25	75	100
5	U23ITTC01	Digital Design and System Architecture	PC	3	0	0	3	25	75	100
Thec	ory Cum Practica	al								
6	U23ENBC02	Communicative English - II	HS	2	0	2	3	50	50	100
Prac	tical							- 00		100
7	U23ESPC02	Design Thinking and IDEA Lab	ES	0	0	2	1	50	50	100
8	U23ADPC01	Programming in Python Laboratory	ES	0	0	2	1	50	50	100
9	U23CSPC02	Data Structures Laboratory	PC	0	0	2	1	50	50	100
10	U23ITPC01	Digital Design and System Architecture Laboratory	PC	0	0	2	1	50	50	100
Abilit	y Enhancement	Course								
11	U23CSC2XX	Certification Course – II **	AEC	0	0	4	_	100	_	100
Mand	latory Course									
12	U23CSM202	Sports Yoga and NSS	MC	0	0	2	-	100	- 1	100
		es are to he selected from the list	•				23	575	625	1200

\*\* Certification Courses are to be selected from the list given in Annexure III

		SEME	STER - III			SHED WAR				from the state
SI.	Course Code	Course Title	Cotomons	P	erio	ds	O1:4		Max. Ma	rks
No.		Course Title	Category	L	T	Р	Credits	CAM	ESM	Tota
Thec					111		- 5		1	41,765
1	U23MATC03	Probability and Statistics	BS	3	1	0	4	25	75	100
2	U23CST301	Embedded System Architecture and Interfacing	PC	3	0	0	3	25	75	100
3	U23CST302	Software Engineering and Testing	PC	3	0	0	3	25	75	100
4	U23CSDC01	Automata and Compiler Design	PC	3	0	0	3	25	75	100
5	U23CST303	Computer Networks	PC	3	0	0	3	25	75	100
Theo	ry Cum Practical									
6	U23CSBC01	Design and Analysis of Algorithms	PC	2	0	2	3	50	50	100
Pract	ical							96.1	37.7	511
7	U23ENPC01	General Proficiency - I	HS	0	0	2	1	50	50	100
8	U23MAPC01	Engineering Mathematics Laboratory	BS	0	0	2	1	50	50	100
9	U23CSP301	Embedded System Architecture and Interfacing Laboratory	PC	0	0	2	1	50	50	100
10	U23CSP302	Software Engineering and Testing Laboratory	PC	0	0	2	1	50	50	100
Abilit	y Enhancement	Course							84	1017
11	U23CSC3XX	Certification Course – III**	AEC	0	0	4	-	100	-	100
12	U23CSS301	Skill Enhancement Course – I*	AEC	0	0	2	-	100	-	100
Mano	latory Course									
13	U23CSM303	Climate Change	MC	2	0	0	-	100		100
1,011	MEET WAS	that a second of the second of					23	675	625	1300

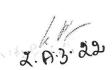
		SEME	STER - IV							
SI.	Course Code	Course Title	Category	F	erio	ds	O114-	N	lax. Mar	ks
No	Course Code	Course Title		L	T	Р	Credits	CAM	ESM	Total
Thec	ory		*						TOTAL	rgi i
1	U23MATC05	Discrete Mathematics and Graph Theory	BS	3	1	0	4	25	75	100
2	U23ITTC02	Programming in Java	ES	3	0	0	3	25	75	100
3	U23CSTC04	Database Management Systems	PC	3	0	0	3	25	75	100
4	U23CSTC05	Operating Systems	PC	3	0	0	3	25	75	100
5	U23CSE4XX	Professional Elective I#	PE	3	0	0	3	25	75	100
Thec	ry Cum Practica									
6	U23CSB401	Android Programming	PC	2	0	2	3	50	50	100
Prac	tical	a straight a					10	G J		
7	U23ENPC02	General Proficiency - II	HS	0	0	2	1	50	50	100
8	U23ITPC02	Programming in Java Laboratory	ES	0	0	2	1	50	50	100
9	U23CSPC03	Database Management Systems Laboratory	PC	0	0	2	1	50	50	100
10	U23CSPC04	Operating Systems Laboratory	PC	0	0	2	1	50	50	100
Abili	ty Enhancement	Course	•							
11	U23CSC4XX	Certification Course – IV **	AEC	0	0	4	-	100	-	100
12	U23CSS402	Skill Enhancement Course -II *	AEC	0	0	2	-	100	-	100
Mand	datory Course		7 11.							
13	U23CSM404	Right to Information and Good Governance	МС	2	0	0	0	100	-	100
		***************************************	1				23	675	625	1300

<sup>#</sup> Professional Electives are to be selected from the list given in Annexure I
\* Skill Enhancement Courses (1and 2) are to be selected from the list given in Annexure III

	A STATE OF	SEMES	STER-V					N/1	ax. Ma	rks
				Pe	rio	ds	Credits			Total
1.	Course	Course Title	Category	L	T	P	Ofculto	CAM	ESM	Total
lo	Code			1 14		19		0.5	75	100
neoi	γ		HS	2	0	0	2	25		
1	U23HSTC02	Research Methodology	PC	3	0	0	3	25	75	100
2	U23CST504	Cloud Computing	PC	3	0	0	3	25	75	100
3	U23CSTC06	Artificial Intelligence		3	0	0	3	25	75	100
	U23CSTC07	Web Designing	PC PE	3	0	0	3	25	75	100
4 5	U23CSE5XX	Professional Elective II #	OE	3	0	0	3	25	75	100
6	U23XXOCXX	Open Elective I \$	OL							
_	tical	Grand Brand Control	PC	0	0	2	1	50	50	100
7	U23CSP503	Cloud Computing Laboratory	PC	0	0	2	1	50	50	100
8	U23CSPC05	Artificial Intelligence Laboratory		0	0	2	1	50	50	100
	U23CSPC06	Web Designing Laboratory	PC	0	10					
9	ect Work		DA	0	Το	2	1	100	-	100
_	U23CSW501	Micro Project	PA	0						
10	ity Enhancemer		150	0		4	_	100	-	100
	U23CSC5XX	Certification Course –V **	AEC	0	-	7				
11		Oct unoducing			$\overline{}$	1		100		10
Mar	datory Course	Essence of Indian Traditional	МС	2	(	) 0		100	te Mister	
12	U23CSM505	Knowledge	,,,,0		1	je	21	600	60	0 120

	1000	SEMESTER	₹ – VI					M	ax. Mai	rks
			Category	Pei	100		Credits	CAM	ESM	Total
SI.	Course	Course Title	Category	L	1	P		OAW		
No	Code	The second secon						25	75	100
Theor	у	contact of account	PC	3	0	0	3			100
1	U23ITTC03	Machine Learning	PC	3	0	0	3	25	75	
2	U23CST605	Designing and Building of Bots		3	0	0	3	25	75	100
	U23CST606	Animation and Visual Effects	PC	3	0	0	3	25	75	100
3		Professional Elective III #	PE	3	0	0	3	25	75	100
4	U23CSE6XX		HS	3	-	0		7. 11	kl I	
5	U23XXOCXX			10	0	2	3	50	50	100
Theo	ry Cum Practic	Blockchain Concepts and Applications	PC	2	0			164 F01		
6	U23CSB602	Blockchain Concepts and 11		ed Flexii	1		1	50	50	100
Pract		I have been been been been been been been be	PC	0	0	2	7.21.1	30	- 00	-
7	U23ITPC03	Machine Learning Laboratory		0	0	2	1	50	50	10
	110000DC04	Designing and Building of Bots	PC	U	0	2	7.1		- 50	10
8	U23CSP604	Laboratory	PC	0	0	2	1	50	50	10
9	U23CSP605	Animation and Visual Effects Laboratory	10	ITTEN	<b>1</b> 117	1111	E IV		EN 1	
		3 , 0 , 1 , 2			T 6	To	1	100	-	10
Proj	ect Work	Last : Duringt	PA	0	C	2	1.19	100	-	
10	U23CSW602	Mini Project				1	<u> </u>	100	-	10
Abil	ity Enhanceme	nt Course	AEC	0		) 4	dracti -	100		_
11	U23CSC6XX	Certification Course - VI						100		10
Mar	datory Course		MC	2	. (	0 0	L .	100		A Comment
12	U23CSM606	Gender Equality	1010				22	625	5 57	0 12

\$ Open electives are to be selected from the list given in Annexure II



		SEN	IESTER – VII				(2000) FC			
SI.	Course Code	Course Title	Category	F	Perio	ds	Credits	Max. Mai		ks
No	Course Code	Course Title	Category	LTP		Credits	CAM	ESM	Total	
Thec	ory	31					67.5	13-5	6/4//2	
1	U23CST707	IoT and Edge Computing	PC	3	0	0	3	25	75	100
2	U23CST708	Data Science and Digital Marketing Analytics	PC	3	0	0	3	25	75	100
3	U23CST709	Neural computation	PC	3	0	0	3	25	75	100
4	U23CSE7XX	Professional Elective IV#	PE	3	0	0	3	25	75	100
5	U23XXOCXX	Open Elective III \$	OE	3	0	0	3	25	75	100
Prac	tical									
6	U23CSP706	IoT and Edge Computing Laboratory	PC	0	0	2	1	50	50	100
7	U23CSP707	Data Science and Digital Marketing Analytics Laboratory	PC	0	0	2	1	50	50	100
Proje	ect Work									
8	U23CSW703	Project phase – I	PA	0	0	4	2	50	50	100
9	U23CSW704	Internship / Inplant Training	PA	0	0	2	1	100	-	100
		, ", "	1 1 7	•			20	375	525	900

		S	EMESTER -	VIII						
SI.	Course Code	Course Title	Cotogomy	P	erioc	ls	Credits		Max. Mark	
No.	Course Code	Course Title	Category	L	Т	Р	Credits	CAM	ESM	Total
Theo	ry		11-	he is a						
1	U23HSTC03	Entrepreneurship and Business Management	HS	3	0	0	3	25	75	100
2	U23CSE8XX	Professional Elective V#	PE	3	0	0	3	25	75	100
3	U23CSE8XX	Professional Elective VI #	PE	3	0	0	3	25	75	100
Proje	ect Work		/ 1451 - 0		Gas	1 11			ļ.	***************************************
4	U23CSW805	Project phase – II	PA	0	0	16	8	50	100	150
		1	1185.725		11 1	THE	17	125	325	450

## ANNEXURE - I PROFESSIONAL ELECTIVE COURSES

onal Elective –I (C	Course Title
	Programming in C++
	Computer Graphics
	Distributed Systems
Service and the service of the servi	IoT Design Protocols
	UI / UX Development
The state of the s	Course Title
The state of the s	Programming in C#
U23ECEC01	Digital Image Processing
U23CSE507	Network Security
U23CSE508	Open-Source Programming for IOT
U23CSE509	Software Project Management
onal Elective –III	Offered in Semester VI)
Course Code	Course Title
U23CSE610	Haskell Programming
U23CSE611	Game Design and Development
U23CSE612	NOSQL Database
	IOT challenges and Future
U23CSE614	Server-Side Scripting Languages
onal Elective –IV	(Offered in Semester VII)
Course Code	Course Title
U23CSE715	Go Programming
	Augmented Reality
	Digital Watermarking and Steganography
U23CSE718	Digital Security
U23CSE719	Drone Technology
onal Elective –V (	Offered in Semester VIII)
Course Code	Course Title
U23CSE820	Redux Programming
U23CSE821	Virtual Reality
U23CSE822	Social Networking
U23CSEC02	Introduction to Industry 4.0
U23CSE823	Testing and Automation
U23CSE823 onal Elective –VI	
U23CSE823  onal Elective –VI  Course Code	Testing and Automation (Offered in Semester VIII)  Course Title
U23CSE823 onal Elective –VI Course Code U23CSE824	Testing and Automation  (Offered in Semester VIII)  Course Title  Kotlin Programming
U23CSE823 onal Elective –VI Course Code U23CSE824 U23CSE825	Testing and Automation  (Offered in Semester VIII)  Course Title  Kotlin Programming Scalable Data Science
U23CSE823 onal Elective –VI Course Code U23CSE824	Testing and Automation  (Offered in Semester VIII)  Course Title  Kotlin Programming
	U23CSE508 U23CSE509  conal Elective –III ( Course Code U23CSE610 U23CSE611 U23CSE612 U23CSE613 U23CSE614  conal Elective –IV Course Code U23CSE715 U23CSE716 U23CSE717 U23CSE718 U23CSE719  conal Elective –V ( Course Code U23CSE719  conal Elective –V ( Course Code U23CSE719  conal Elective –V ( Course Code U23CSE820 U23CSE821 U23CSE822

ANNEXURE - II
OPEN ELECTIVE COURSES (R-2023)

S. No.	Course Code	Course Title	Offering Department	Permitted Departments
Open E	Elective – I (Offere	d in Semester V/VI)		
1	U23CSOC01	Structured Query Language	CSE	ECE, EEE, ICE, MECH, CIVIL, BME and MECHTRONICS
2	U23CSOC02	Computer Peripherals and Networking	CSE	Offered to all Branches
pen Ele	ective – II (Offered	in Semester VII)		
1	U23CSOC03	Web Programming	CSE	ECE, EEE, ICE, MECH, CIVIL, BME AND MECHTRONICS
2 ,	U23CSOC04	Cloud Technology	CSE	ECE, EEE, ICE, MECH, CIVIL, BME and MECHTRONICS

ANNEXURE - III

### ABILITY ENHANCEMENT COURSES-(A) CERTIFICATION COURSES

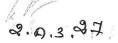
S. No	Course Cod	e Course Title	Certified By
1	U23XXCX0	1 Adobe Photoshop	
2	U23XXCX0		Adobe
3	U23XXCX0	Adobe Dreamweaver	Adobe
4	U23XXCX04		Adobe
5	U23XXCX0		Adobe
6	U23XXCX06	Adobe InDesign	Adobe
7	U23XXCX07		Adobe
8	U23XXCX08		Autodesk
9	U23XXCX09		Autodesk
10	U23XXCX10		Autodesk
11	U23XXCX11		Autodesk
12	U23XXCX12	TO A STATE OF THE	Autodesk
13	U23XXCX13		Autodesk
14	U23XXCX14		AWS
15	U23XXCX15	Cloud Foundation	AWS
16	U23XXCX16	Cloud Practitioner	AWS
17	U23XXCX17	Cloud Solution Architect	AWS
18	U23XXCX18	Data Engineering	AWS
19	U23XXCX19	Machine Learning Foundation	AWS
20	U23XXCX20	Robotic Process Automation / Medical Robotics	AWS
21	U23XXCX21	Advance Programming Using C	Blue Prism
22	U23XXCX22	Advance Programming Using C ++	CISCO
23	U23XXCX23	C Programming	CISCO
24	U23XXCX24	C++ Programming	CISCO
25	U23XXCX25	CCNP Enterprise: Advanced Routing	CISCO
26	U23XXCX26	CCNP Enterprise: Core Networking	CISCO
27	U23XXCX27	Cisco Certified Network Associate - Level 2	CISCO
28	U23XXCX28	Cisco Certified Network Associate - Level 2	CISCO
29	U23XXCX29	Cisco Certified Network Associate- Level 3	CISCO
30	U23XXCX30		CISCO
31	U23XXCX31	Fundamentals Of Internet of Things	CISCO
32	U23XXCX31	Internet Of Things / Solar and Smart Energy System with IoT	CISCO
33	U23XXCX32	Java Script Programming	CISCO
34	U23XXCX34	NGD Linux Essentials	CISCO
35	U23XXCX34	NGD Linux II	CISCO
36			CISCO
	U23XXCX36	Advance Java Programming	Ethnotech
37	U23XXCX37	Android Programming / Android Medical App Development	Ethnotech
	U23XXCX38	Angular JS	Ethnotech
	U23XXCX39	Catia	Ethnotech
	U23XXCX40	Communication Skills for Business	Ethnotech
	U23XXCX41	Coral Draw	Ethnotech
	U23XXCX42	Data Science Using R	Ethnotech
3	U23XXCX43	Digital Marketing	Ethnotech

B.Tech. Computer Science and Engineering

2.0-3.208

44		- jetem comg c	Ethnotech
45			Ethnotech
46	U23XXCX46	English For IT	Ethnotech
47	U23XXCX47	7 Plaxis	THE PART OF THE PART OF
48	U23XXCX48	Sketch Up	Ethnotech
49	U23XXCX49	Financial Planning, Banking and Investment Management	Ethnotech
50	U23XXCX50	Foundation Of Stock Market Investing	Ethnotech
51	U23XXCX51	Machine Learning / Machine Learning for Medical Diagnosis	Ethnotech
52	U23XXCX52	IOT Using Python	Ethnotech
53	U23XXCX53	3. 1	Ethnotech
54	U23XXCX54	( and a contralation)	Ethnotech
55	U23XXCX55	Total, riputado	Ethnotech
56	U23XXCX56		Ethnotech
 57	U23XXCX57		Ethnotech
58	U23XXCX57		Ethnotech
59		Solid works	Ethnotech
	U23XXCX59	Staad Pro	Ethnotech
60	U23XXCX60	Total Station	Ethnotech
61 62	U23XXCX61	Hydraulic Automation	Festo
63	U23XXCX62	Industrial Automation	Festo
	U23XXCX63	Pneumatics Automation	Festo
64	U23XXCX64	Agile Methodologies	IBM
65	U23XXCX65	Block Chain	IBM
66	U23XXCX66	Devops	IBM
67	U23XXCX67	Artificial Intelligence	ITS
68	U23XXCX68	Cloud Computing	ITS
69	U23XXCX69	Computational Thinking	ITS
70	U23XXCX70	Cyber Security	ITS
71	U23XXCX71	Data Analytics	ITS
72	U23XXCX72	Databases	ITS
73	U23XXCX73	Java Programming	ITS
74	U23XXCX74	Networking	ITS
75	U23XXCX75	Python Programming	ITS
76	U23XXCX76	Web Application Development (HTML, CSS, JS)	ITS
77	U23XXCX77	Network Security	
78	U23XXCX78	MATLAB	ITS & Palo alto MathWorks
79	U23XXCX79	Azure Fundamentals	Microsoft
80	U23XXCX80	Azure Al (Al-900)	
81	U23XXCX81	Azure Data (DP -900)	Microsoft
82	U23XXCX82	Microsoft 365 Fundamentals (SS-900)	Microsoft
33	U23XXCX83	Microsoft Security, Compliance and Identity (SC-900)	Microsoft Microsoft
34	U23XXCX84	Microsoft Power Platform (PI-900)	Microsoft
35	U23XXCX85	Microsoft Dynamics Fundamentals 365 – CRM	Microsoft
36 37		Microsoft Excel	Microsoft
		Microsoft Excel Expert	Microsoft
38	THE SECRET PROPERTY OF THE PARTY.	Securities Market Foundation	NISM
39		Derivatives Equinity	NISM
00		Research Analyst	NISM
91	U23XXCX91	Portfolio Management Services	NISM

B.Tech. Computer Science and Engineering



92	U23XXCX92	Cyber Security	Palo alto
93	U23XXCX93	Cloud Security	Palo alto
94	U23XXCX94	PMI – Ready	PMI
95	U23XXCX95	Tally – GST & TDS	Tally
96	U23XXCX96	Advance Tally	Tally
97	U23XXCX97	Associate Artist	Unity
98	U23XXCX98	Certified Unity Programming	Unity
99	U23XXCX99	VR Development	Unity

## ABILITY ENHANCEMENT COURSES - (B) SKILL ENHANCEMENT COURSES

SI. No.	Course Code	Course Title
Α.	U23CSS301	Skill Enhancement Course 1 *
1		Computer Assembly and Troubleshooting
1.		2) Aptitude - I
	143	Electronic Devices and Circuits
		Skill Enhancement Course 2 *
2	U23CSS402	Exploring Photoshop
۷.	023033402	2) Aptitude - II
	k	3) Office Automation

<sup>\*</sup> Any one course to be selected from the list

## **ANNEXURE-I**

(Syllabi of V and VI Sem)

2.A-3.30

# SEMESTER V

2. A. 3. 32

Department	Computer Science and Engineering	Programi									
Semester	V			Code: I	HS *End	d Semes	ter Exam	Type: <b>TI</b>			
Course Code	U23HSTC02		ls/Week		Credit	Maxim	um Marks				
Course Name	RESEARCH METHODOLOGY	L	T	Р	С	CAM	ESE	TM			
Course marrie		2	0	0	2	25	75	100			
Di	(Common t	to all branc	hes)			-					
Prerequisite	Nil										
	On completion of the course, the stud	dents will l	be able t	o			BT Map				
	CO1 Interpret the different types of research	h and expla	in how res	search r	nethods	can be	(Highest	······································			
	used to address engineering problem	S.					K2	2			
	Discuss the research problems, conduct comprehensive literature reviews, and utilize tools and services for effective information retrieval.										
Course	Apply appropriate methods to design	et									
Outcomes	results using both numerical and grap		K3	<b>}</b>							
	Analyze and apply ethical guidelines t dissertations, ensuring academic integrations.	and	K4								
	Examine the fundamentals of intellect	ual property	rights to r	protect a	and enfor	ce them,					
	with emphasis on their role in fostering engineering.	g innovation	and entre	preneu	rship in		КЗ				
UNIT- I	Introduction to Research					Po	riods: 06				
Meaning and Imp	Postance of Research, Types of Research: Ov	erview of E	Basic, App	lied. ar	nd Develo						
Sverview of the r	research Process, Defining a Research Proble	em: Key Cor	nsideration	ne Setti	na Roca	arch Ohi	notives and	CO1			
Qualitative.	ons, Introduction to Research Design: Basic	c Concepts,	Approac	thes to	Researd	ch: Quar	ititative vs.	COI			
JNIT- II	Problem Formulation and Literature R	eview				Pei	riods: 06				
dentifying and E	Formulating Beasarch Brokland (										
Citation Methods:	Formulating Research Problems, conducting Basic Techniques. Sources of Information: Ov	a Literature erview of Lib	Review:	Essent Coling	tial Steps	s, Refere	encing and	CO2			
		CIVICW OI LIK	nanes an	u Omme	Databa	ses.					
JNIT- III	Research Methods and Data Analysis					Per	iods: 06				
Surveys, Basics o	perimental Research, Developing Hypotheses: of Data Analysis: Numerical and Graphical Anal	Basic Appro Vsis Introdu	oach. Data ction to In	a Collec	tion Met	nods: Sar	mpling and	CO3			
JNIT- IV	Writing and Presenting Research	ysis, mirodu	Clion to m	liererilla	ıı Statistit	, S.	riods: 06				
reparing a Rese	arch Report: Key Sections (Abstract, Introduction	on, Methodo	logy, Res	ults, Dis	cussion,	Conclus	\	204			
Referencing and 0 JNIT- V	Citation: Brief Overview.				,	••••		CO4			
	Introduction to Intellectual Property Ri	ghts (IPR)				Per	riods: 06				
ntroduction to Pa	ations in Research: Introduction to Scientific tents, Copyrights, and Trademarks – Case stud	: Misconducties on ethic	ct. Basics al dilemm	of Int	ellectual	Property	<sup>/ Rights</sup> -c	005			
ecture Period:	s: 30 Tutorial Periods: 0	Praction	cal Perio	ds: 0		Periods:					
ext Books				I.							
. Kumar, R., "	Research Methodology: A Step-by-Step G	uide for Be	ginners"	, 5 <sup>th</sup> Ed	ition, SA	GE Pub	olications, 2	2019.			
. Creswell, J.	W., and Creswell, J. D., "Research Design	: Qualitativ	e, Quant	itative,	and Mix	red Meth	nods				
Reference E	", 5 <sup>th</sup> Edition, SAGE Publications, 2018.										
	I. N. K., Lewis, P., and Thornhill, A., "Rese	arch Moth	ode for D	uninna	- Ct	-1-" Oth I					
2019.	H. H., Lewis, F., and Thornmi, A., Trese	arch Meth	ous ioi b	usines	Soluder	its , 8" i	Edition, Pe	earson,			
. Sekaran, U.,	and Bougie, R. Research Methods for Bu	siness: A S	kill-Build	ing Apr	proach, 8	3 <sup>th</sup> Editic	n. Wilev. 2	2020			
. Bhattacherje	e, A., "Social Science Research: Princip	oles, Meth	ods, and	Pract	ices", 2	nd Editio	n. Create	Space			
Independent	Publishing, 2012.		<u>,</u>		,		m, croate	орасс			
leb References	S										
https://conjoi		······			······	······································	······				
	urdue.edu/owl/research_and_citation/cond	uctina rec	-arch/wri	ting c	literet	o rovie	a, btccl	<u> </u>			
	ric.ed.gov/fulltext/ED536788.pdf	domig_rest	Jai Gi I/ WI I	ung_a_	_iiieratul	e_revie/	w.numi				
1	rcheracademy.elsevier.com/										
https://www.v											
•		•••••	······		·····	·····	·····				

### COs/POs/PSOs Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	1	1	1	1	1	1	1	3
CO2	2	3	2	2	2	1	1	1	2	2	1	3
CO3	3	3	3	3	2	1	1	1	1	1	2	2
CO4	2	2	1	2	1	1	1	3	2	3	1	2
CO5	2	2	2	2	1	2	2	3	2	2	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

	Internal	Assessn	nent Mar	ks (IAM)		End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

Department	Comp	outer Science and Engineering	Program	mme: <b>B</b> .	T!					***************************************
Semester	V			Catego						
Course Code					ıy. PC		⊨na	Semeste	r Exam	Туре: <b>Т</b>
	U23C	ST504	Periods			Cre	dit	Maximu	ım Mark	S
Course Name	CLOU	D COMPUTING	<b>L</b> 3	<b>T</b>   0	P	C		CAM	ESE	TIV
					0	3		25	75	100
Prerequisite	Basics	of Networks	CSE						.1	
						-				
	011 001	mpletion of the course, the student	s will be a	ble to					BT Ma	apping
	CO1	Demonstrate the Architecture and D	)enlovment	modolo	of Classi		•			t Level)
Course	CO1 Demonstrate the Architecture and Deployment models of Cloud computing.  CO2 Understand virtualization concepts in Cloud									
Outcomes	CO3	Build AWS Cloud	III Oloud						K	
	CO4	Relate Cloud Deployment tools							K3	
	CO5	Select the security issues and analy	ze it						K	
UNIT - I	Introd	uction to Cloud Computing and	I A :4	ture	I	Period			K	3
Cloud Computing:	Overview	- History Characteristics Madela D	<b></b>							
In the Cloud, Arch	nitecture:	Components of Cloud Architecture Cloud - Private Cloud - Hybrid Cloud	- Service	-Oriented	yes - Pa 1 Archite	rallel an	a Dist	tributed Co	mputing	CO1
UNIT - II			- Communi	ty Cloud	, Al Cilite	ciule (	30A)	in Cloud	- Cloud	
	viituai	2duon in Cioud Computing				Period	s:09			
viitualization: Introd - Virtualization in C	duction- (	Concepts - Architectures - Processor vironments: Role of Virtualization in	Virtualizatio	on - Mem				rage Virtu	alization	
Virtualization: Virtua	alization S	vironments: Role of Virtualization in Security - Performance and Managen	Cloud Co	mputing	- Virtual	ized Da	ta Ce	enters - Ac	dvanced	CO2
UNIT - III		Security -, Performance and Managen  Ioud Computing Basics	nent in Virti	ualized C	louas.					
ntroduction to AWS	Cloud: (	Propriory of Claud Carrier				Periods	s:09			L
Services - Storage S	Services	Overview of Cloud Computing - AWS - AWS Networking and Security: AWS	Global Infra	astructure	e - Core	AWS Se	ervice	s: Compute	е	CO3
(IAM) - AWS Securi	ty.	AVVS	Networkir	ng - AVVS	Identity	and Acc	cess N	Manageme	nt	
JNIT - IV	Cloud [	Deployment Tools				Periods	.00			
Google App Engine:	Overvie	v of Google App Engine (GAE) - Key Overview - Azure architecture - Vir	features ar	nd service			occurs in			
services – Microso	oft Azure	o Google App Engine (GAE) - Key : Overview - Azure architecture - Vir e services: Nova – Swift – Neutron –	tual Machi	nes. Azu	re Funct	nosung	, scall	ing, and ma	anaged	
			Glance – k	eystone.	io i diloi	.10113 — (	Spend	Stack: Ove	rview -	CO4
	Cloud 3	ecurity				eriods	:09			
dentity and Access	1-Specific	: Attacks: Guest hopping – VM migrat nent (IAM) - IAM Challenges - IAM Ar	ion attack -	- hyperja	cking. D	ata Seci	urity a	nd Storage	<b>-</b> -	
	_	This enalienges - IAM AN	chitecture a	and Pract	tice.		u	ina Otorage		CO5
OCTURA Daviada.										CO3
ecture Periods:2	<b>+</b> 3		Practical	Periods	5:0		Tota	I Periods	: 45	
ext Books		Tutorial Periods: 0	Practical			İ		l Periods		
ext Books		Tutorial Periods: 0				ting: Fo				
ext Books  1. Rajkumar B Programmir	uyya, Ch	Tutorial Periods: 0  ristian Vecchiola, and Thamarai Selvi	S,"Masteri	ing Cloud	l Compu	ting: Fo				ıs
ext Books  1. Rajkumar B Programmir 2. Anthony T.	uyya, Ch ng", 2 <sup>nd</sup> E Velte. "Cl	ristian Vecchiola, and Thamarai Selvi dition,2023.	S,"Masteri	ing Cloud	l Compu		undati	ions and A	pplication	
ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst , ,2023.	luyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Techn ecurity Handbook: Securely Deploy, N	S,"Masteri ologies" ,1 //anage, an	ing Cloud st edition nd Operat	Compu ,2023. te in the	Cloud",	undati 1 <sup>st</sup> Edi	ions and A	pplicatior	
ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst, ,2023. 4. Cornelia Da	uyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Techn ecurity Handbook: Securely Deploy, M	S,"Masteri ologies" ,1 //anage, an	ing Cloud st edition ad Opera	Compu ,2023. te in the	Cloud",	undati 1 <sup>st</sup> Edi	ions and A	pplicatior	ng
ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst, ,2023. 4. Cornelia Da 5. Kai Hwang,	uyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S vis, "Clou Geoffrey	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Techn ecurity Handbook: Securely Deploy, Mative Patterns: Designing Change C Fox. Jack G Dongarra "Distributed	S,"Masteri ologies" ,1 //anage, an	ing Cloud st edition ad Opera	Compu ,2023. te in the	Cloud",	undati 1 <sup>st</sup> Edi	ions and A	pplicatior	ng
ecture Periods:2 ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst , ,2023. 4. Cornelia Da 5. Kai Hwang, Things", 1st	uyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S vis, "Clou Geoffrey	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Techn ecurity Handbook: Securely Deploy, N	S,"Masteri ologies" ,1 //anage, an	ing Cloud st edition ad Opera	Compu ,2023. te in the	Cloud",	undati 1 <sup>st</sup> Edi	ions and A	pplicatior	ng
ecture Periods:2 ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst , ,2023. 4. Cornelia Da 5. Kai Hwang, Things", 1st	uyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S vis, "Clou Geoffrey Edition, M	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Techn ecurity Handbook: Securely Deploy, M d Native Patterns: Designing Change C Fox, Jack G Dongarra, "Distributed lorgan Kaufmann Publishers, 2012.	S,"Masteri ologies" ,1 //anage, an -Tolerant S I and Cloud	ing Cloud st edition d Operati Software" d Comput	,2023. te in the ,1st Edit ting, Fron	Cloud", ion, Mar n Parall	undati 1 <sup>st</sup> Edi nning el Pro	ions and A ition, Packi publication cessing to	pplicatior	ng
ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst , ,2023. 4. Cornelia Da 5. Kai Hwang, Things", 1st   eference Books  1. Erick M. Fra	uyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S vis, "Clou Geoffrey Edition, M	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Techn ecurity Handbook: Securely Deploy, Md Native Patterns: Designing Change C Fox, Jack G Dongarra, "Distributed lorgan Kaufmann Publishers, 2012.	S,"Masteriologies" ,1 Manage, and -Tolerant S	ing Cloud st edition ad Operat Software I Comput	J Compu ,2023. te in the ,1st Edit ting, Fron	Cloud", ion, Mar n Parall	undati 1 <sup>st</sup> Edi nning el Pro	ions and A ition, Packi publication cessing to	pplicatior	ng
ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst , ,2023. 4. Cornelia Da 5. Kai Hwang, Things", 1st eference Books  1. Erick M. Fra 2. Jeroen Muld	uyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S vis, "Clou Geoffrey Edition, M ncisco, "C	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Techn ecurity Handbook: Securely Deploy, Mative Patterns: Designing Change C Fox, Jack G Dongarra, "Distributed lorgan Kaufmann Publishers, 2012. Cloud Computing: Concepts and Techn Cloud Strategy for Cloud Architected.	S,"Masteri ologies" ,1 Manage, and -Tolerant S I and Cloud	ing Cloud st edition ad Operat Software I Comput	J Compu ,2023. te in the ,1st Edit ting, Fron	Cloud", fion, Mar n Parall	undati	ions and A ition, Packt publication ocessing to	pplication t publishin ns, 2023. the Inter	ng
ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst , ,2023. 4. Cornelia Da 5. Kai Hwang, Things", 1st   eference Books  1. Erick M. Fra. 2. Jeroen Muld 3. lan Foster ar 4. Vikram Dhillo	ruyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S vis, "Clou Geoffrey Edition, M ncisco, "C er, "Multi- nd Dennis	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Techn ecurity Handbook: Securely Deploy, Mative Patterns: Designing Change C Fox, Jack G Dongarra, "Distributed lorgan Kaufmann Publishers, 2012. Cloud Computing: Concepts and Techn Cloud Strategy for Cloud Architects" B. Gannon, "Cloud Computing for State Computing Resigns A Non Tookside	S,"Masteri rologies" ,1 Manage, and r-Tolerant S and Cloud mologies for ,1st Edition cience and	ing Cloud st edition ad Operat Goftware t Comput or Archite , Apress, Enginee	,2023. te in the ting, Froncts",1 <sup>st</sup> e cts",1 <sup>st</sup> e 2023. ring",1 <sup>st</sup>	Cloud", fion, Mar n Parall edition, Fi	undati  1st Edi  nning el Pro  Apress  MIT p	ions and A ition, Packt publication ocessing to s, 2023.	pplication t publishin ns, 2023. the Inter	ng
ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst , ,2023. 4. Cornelia Da 5. Kai Hwang, Things", 1st   eference Books  1. Erick M. Fra. 2. Jeroen Muld 3. lan Foster ar 4. Vikram Dhillo 5. Nikos Antono	Juyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S vis, "Clou Geoffrey Edition, M ncisco, "C er, "Multi- nd Dennis on, "Cloud opoulos, s	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Technic dition, 2023. d Native Patterns: Designing Change C Fox, Jack G Dongarra, "Distributed lorgan Kaufmann Publishers, 2012. Cloud Computing: Concepts and Technic distribution of Selection (Cloud Strategy for Cloud Architects" B. Gannon, "Cloud Computing for Selection of Computing Basics: A Non-Technica Spiros Zervas, "Cloud Data Manager	S,"Masteri rologies" ,1 Manage, and r-Tolerant S and Cloud mologies for ,1st Edition cience and	ing Cloud st edition ad Operat Goftware t Comput or Archite , Apress, Enginee	,2023. te in the ting, Froncts",1 <sup>st</sup> e cts",1 <sup>st</sup> e 2023. ring",1 <sup>st</sup>	Cloud", fion, Mar n Parall edition, Fi	undati  1st Edi  nning el Pro  Apress  MIT p	ions and A ition, Packt publication ocessing to s, 2023.	pplication t publishin ns, 2023. the Inter	ng
ecture Periods:2 ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst , ,2023. 4. Cornelia Da 5. Kai Hwang, Things", 1st   eference Books  1. Erick M. Fra 2. Jeroen Muld 3. lan Foster ar 4. Vikram Dhillo 5. Nikos Antono Edition,Sprin	Juyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S vis, "Clou Geoffrey Edition, M ncisco, "C er, "Multi- nd Dennis on, "Cloud opoulos, s	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Technic dition, 2023. d Native Patterns: Designing Change C Fox, Jack G Dongarra, "Distributed lorgan Kaufmann Publishers, 2012. Cloud Computing: Concepts and Technic distribution of Selection (Cloud Strategy for Cloud Architects" B. Gannon, "Cloud Computing for Selection of Computing Basics: A Non-Technica Spiros Zervas, "Cloud Data Manager	S,"Masteri rologies" ,1 Manage, and r-Tolerant S and Cloud mologies for ,1st Edition cience and	ing Cloud st edition ad Operat Goftware t Comput or Archite , Apress, Enginee	,2023. te in the ting, Froncts",1 <sup>st</sup> e cts",1 <sup>st</sup> e 2023. ring",1 <sup>st</sup>	Cloud", fion, Mar n Parall edition, Fi	undati  1st Edi  nning el Pro  Apress  MIT p	ions and A ition, Packt publication ocessing to s, 2023.	pplication t publishin ns, 2023. the Inter	ng
ext Books  1. Rajkumar B Programmir 2. Anthony T. 3. Einar Høst , ,2023. 4. Cornelia Da 5. Kai Hwang, Things", 1st   eference Books  1. Erick M. Fra 2. Jeroen Muld 3. lan Foster ar 4. Vikram Dhillo 5. Nikos Antono	Juyya, Ch ng", 2 <sup>nd</sup> E Velte, "Cl "Cloud S vis, "Clou Geoffrey Edition, M ncisco, "C er, "Multi- nd Dennis on, "Cloud opoulos, s	ristian Vecchiola, and Thamarai Selvi dition,2023. oud Computing: Concepts and Technic dition, 2023. d Native Patterns: Designing Change C Fox, Jack G Dongarra, "Distributed lorgan Kaufmann Publishers, 2012. Cloud Computing: Concepts and Technic distribution of Selection (Cloud Strategy for Cloud Architects" B. Gannon, "Cloud Computing for Selection of Computing Basics: A Non-Technica Spiros Zervas, "Cloud Data Manager	S,"Masteri rologies" ,1 Manage, and r-Tolerant S and Cloud mologies for ,1st Edition cience and	ing Cloud st edition ad Operat Goftware t Comput or Archite , Apress, Enginee	,2023. te in the ting, Froncts",1 <sup>st</sup> e cts",1 <sup>st</sup> e 2023. ring",1 <sup>st</sup>	Cloud", fion, Mar n Parall edition, Fi	undati  1st Edi  nning el Pro  Apress  MIT p	ions and A ition, Packt publication ocessing to s, 2023.	pplication t publishin ns, 2023. the Inter	ng

- https://cic.gsa.gov > basics > cloud-basics 1.
- https://cloud.google.com/learn/what-is-cloud-computing 2.
- https://www.ibm.com/cloud-security 3.
- https://aws.amazon.com/getting-started/ 4.
- https://www.geeksforgeeks.org/cloud-deployment-models/
  - \* TE Theory Exam, LE Lab Exam

COs/POs/PSOs Mapping

Cos	Program Outcomes (POs)											Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	-	-	2	-	_	-	_	-	-	2	2	3	1
2	3	3	-	2	2	-	-	-	-	-	-	2	2	3	1
3	2	2	2	-	3	-	-	-	-	-	-	1	3	3	2
4	3	2	=	2	3	-	-	-	=	-	-	1	2	3	2
5	2	3	3	2	3	2	_	-	_	-		3	2	3	2

#### Correlation Level: 1 - Low, 2 - Medium, 3 - High Evaluation Methods

	Continuo	us Assess	End	Total			
Assessment	CAT 1	CAT 1 CAT 2		Assignment*	Attendance	Semester Examinati on (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	uter Science and Engineering	Progra	mmo	: B.Tech				
Semester	V	J				<b> </b>			
Course Code	U23CS	TC06			egory: <b>PC</b>	End Sem	ester Exa	іт Туре:	TE
DIA F					Week	Credit		ximum N	
Course Name	ARTIFI	CIAL INTELLIGENCE	L	Ţ	Р	С	CAM	ESE	TN
			3	0	0	3	25	75	100
Prerequisite	Basics	(Common ( of Algorithms and Probability	JSE, II and	d CCI	Ε)				
	On cor	mpletion of the course, the students							
		represent of the course, the students	will be able	to				BT M	apping
	CO1	Understand Al fundamentals and an	-1			).		(Highes	st Leve
Course	CO2	Understand AI fundamentals and app	oly search s	trateg	ies to solve	complex pro	blems	I	<b>&lt;</b> 2
Outcomes	CO3	Build and Apply Fuzzy logic and Pred	e representa	tion			TV 2 I I I	ŀ	(3
outcomes	CO4	Categorize models and manage	icate logic.						(3
	CO5	Categorize models and manage unce Apply the AI in different fields	ertainty usin	g prob	pabilistic rea	soning tech	niques.		(3
UNIT - I		The state of the s							(3
	Foundation	ction to Al and Problem Solving				Periods:0	9		
search - RFS - I	DES Inf	ns of AI - History of AI - Agents Structuormed search - Greedy Best First Se	re and its ty	pes. F	Problem So	lving by Sea	rchina: Uni	nformed	
Problem(CSP)	acktracki	ormed search - Greedy Best First Seng search for CSP.	earch - A*	Searc	h - AO* Se	earch - Con	straint Sat	isfaction	CO
						1 9	ou anne out	ioraction	
ntroduction to K	Kilowie	dge Representation				Periods:09			
Extended servert	nowledge	Representation: Types - Approaches s - Frames - Conceptual dependencies	- Knowled	lge re	epresentatio	n using Se	mantic No		
			- Scripts.		,	aomig oe	mandic Ne	twork –	CO
UNII - III	ruzzy ai	nd Predicate Logic				Periods:0	Q		
sasic Concepts of	of Fuzzy S	Set Theory – Operations of Fuzzy Serations on Fuzzy Relations – Fuzzy Sys	ts – Proper	ties o	f Euzzy Co				
Relational Equatio	ns – Oper	rations on Fuzzy Relations – Fuzzy Sys	tems – Logi	cal Δ	nente Dradi	esta Lasia	Relations -	- Fuzzy	
		, Baokwara Chairing.	209	oui / ig	jenio, meui	cate Logic –	First-Orde	r Logic,	CO3
UNII - IV	Probab	ilistic Reasoning				Dorio de o			
Probabilistic Nota	tions - B	aves rule - Bavesian Network Dro	habilistic r			Periods:0			
Inderstanding Par	tially Obs	ervable Environments - Inference in Te	mporel Mas	ason	ing over ti	me: Time a	and Uncer	tainty -	
empster and Sha	fer Theory	/.	inporal Mod	ieis -	Hidden Mai	kov Models	- Kalman I	Filters -	CO4
UNIT - V	Annlicati	ons of AI							
	Diseases F	Olis of Al				Periods:09	)	i	
ducation: Adaptive	olografia	Diagnosis and Prediction.Al In Finance	e: Automate	d tra	ding and P	ortfolio Man	agement -	- Al in	
addation. Adaptiv	e Leaniing	g and Assessment – Al in Customer ser	vice: Chatbo	ot and	Virtual Ass	istance.	300110		CO5
ecture Periods	:45	Tutorial Periods: 0							7.5
***************************************					~~~ ^	Tot	tal Period	s·45	
ext Books		rutoriai Ferious: 0	Practical	Peri	ous: u	10	iai renou	0.70	
	soll and F					k			
1. Stuart Rus	sell and F	eter Norvig, "Artificial Intelligence: A M	odorn Annra		4th E III	4			
Stuart Rus     Elaine Ric		Peter Norvig, "Artificial Intelligence: A Mo	odern Appro	ach",	4 <sup>th</sup> Edition,	Pearson Edi	ucation, 20	20.	
<ol> <li>Stuart Rus</li> <li>Elaine Ric</li> <li>S. Rajase</li> </ol>	ekaran, C	Peter Norvig, "Artificial Intelligence: A Monipers of the Norvig, "Artificial Intelligence: A Monipers of the Norvigal New York (New York) New York (New York) New York (New York) New York (New York)	odern Appro cial Intelliger	ach",	4 <sup>th</sup> Edition,	Pearson Edi	ucation, 20	20.	s and
Stuart Rus     Elaine Rici     S. Rajase     application	ekaran, C	eter Norvig, "Artificial Intelligence: A M	odern Appro cial Intelliger	ach",	4 <sup>th</sup> Edition,	Pearson Edi	ucation, 20	20.	s and
<ol> <li>Stuart Rus</li> <li>Elaine Rick</li> <li>S. Rajase</li> <li>application</li> </ol> eference Books	ekaran, ( s",15 <sup>th</sup> Ed	Peter Norvig, "Artificial Intelligence: A Monicial Intelligence: A Moni	odern Appro cial Intelliger etworks, Fu	ach", ice", 3 zzy	4 <sup>th</sup> Edition, 3 <sup>rd</sup> Edition, M Logic and	Pearson Edi McGraw Hill, Genetic A	ucation, 20 2017. Algorithms	20.	s and
<ol> <li>Stuart Rus</li> <li>Elaine Rick</li> <li>S. Rajase application</li> <li>eference Books</li> <li>Cherry Bha</li> </ol>	ekaran, (es",15 <sup>th</sup> Ed	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artific B.A. Vijayalakshmi Pai, "Neural Neition, PHI Learning Private Limited,201"	odern Appro cial Intelliger etworks, Fu	ach", nce", 3 zzy	4 <sup>th</sup> Edition, 3 <sup>rd</sup> Edition, N Logic and	Pearson Edi AcGraw Hill, Genetic A	ucation, 20 2017. Algorithms	20. synthesi	
Stuart Rus     Elaine Rick     S. Rajase     application     ference Books     Cherry Bha	ekaran, (es",15 <sup>th</sup> Ed	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artific B.A. Vijayalakshmi Pai, "Neural Neition, PHI Learning Private Limited,201"	odern Appro cial Intelliger etworks, Fu	ach", nce", 3 zzy	4 <sup>th</sup> Edition, 3 <sup>rd</sup> Edition, N Logic and	Pearson Edi AcGraw Hill, Genetic A	ucation, 20 2017. Algorithms	20. synthesi	
1. Stuart Rus 2. Elaine Rici 3. S. Rajase application eference Books 1. Cherry Bha 2. S. Kanimo Press,2021	ekaran, C s",15 <sup>th</sup> Ed argava," A ozhi Sugu	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artific B.A. Vijayalakshmi Pai, "Neural Ne ition, PHI Learning Private Limited,2012 rtificial Intelligence Fundamentals and A Ina, M.Dhivya,Sra Paiva, "Artificial In	odern Appro cial Intelliger etworks, Fu 1. Applications'	ach", nce", 3 zzy ', 1 <sup>st</sup> E Rece	4 <sup>th</sup> Edition, 8 <sup>rd</sup> Edition, M Logic and Edition, CRC nt Trends	Pearson Edi AcGraw Hill, Genetic A	ucation, 20 2017. Algorithms	20. synthesi	
<ol> <li>Stuart Rus</li> <li>Elaine Rici</li> <li>S. Rajase application</li> <li>eference Books</li> <li>Cherry Bha</li> <li>S. Kanimo Press,2021</li> <li>Wolfgang E</li> </ol>	ekaran, C s",15 <sup>th</sup> Ed argava," A ozhi Sugu Ertel," Intro	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artificial Neition, PHI Learning Private Limited,2012 rtificial Intelligence Fundamentals and Anna, M.Dhivya,Sra Paiva, "Artificial Intelligence"	odern Appro cial Intelliger etworks, Fu 1. Applications' ntelligence	ach", nce", 3 zzy ', 1 <sup>st</sup> E Rece	4 <sup>th</sup> Edition, 8 <sup>rd</sup> Edition, N Logic and Edition, CRC nt Trends	Pearson Edi  McGraw Hill, Genetic A  Press,2021  and Applica	ucation, 20, 2017. Algorithms	20. synthesi	"CRC
<ol> <li>Stuart Rus</li> <li>Elaine Rick</li> <li>S. Rajase application</li> <li>Cherry Bha</li> <li>S. Kanimo Press,2021</li> <li>Wolfgang E</li> <li>David Poo</li> </ol>	ekaran, C s",15 <sup>th</sup> Ed argava," A ozhi Sugu Ertel," Intro le and Al	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artificial Neinight, and Shivashankar B. Nair, "Artificial." Neural Neition, PHI Learning Private Limited, 2012 rtificial Intelligence Fundamentals and Anna, M.Dhivya, Sra Paiva, "Artificial Intelligence", 2 <sup>nd</sup> Edian Mackworth," Artificial Intelligence.	odern Appro cial Intelliger etworks, Fu 1. Applications' ntelligence	ach", nce", 3 zzy ', 1 <sup>st</sup> E Rece	4 <sup>th</sup> Edition, 8 <sup>rd</sup> Edition, N Logic and Edition, CRC nt Trends	Pearson Edi  McGraw Hill, Genetic A  Press,2021  and Applica	ucation, 20, 2017. Algorithms	20. synthesi	"CRC
<ol> <li>Stuart Rus</li> <li>Elaine Rick</li> <li>S. Rajase application</li> <li>Cherry Bha</li> <li>S. Kanimo Press,2021</li> <li>Wolfgang E</li> <li>David Poo University F</li> </ol>	ekaran, C s",15 <sup>th</sup> Ed argava," A ozhi Sugu Ertel," Intro le and Al Press, 201	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artificial A. Vijayalakshmi Pai, "Neural Neition, PHI Learning Private Limited,201" rtificial Intelligence Fundamentals and Ana, M.Dhivya, Sra Paiva, "Artificial Intelligence", 2 <sup>nd</sup> Edan Mackworth," Artificial Intelligence: 7.	odern Approcial Intelliger tworks, Full.  Applications' ntelligence ition, Spring	ach", ace", 3 zzy , 1 <sup>st</sup> E Rece er, 20	4 <sup>th</sup> Edition, Brd Edition, Manager Logic and Edition, CRC Int Trends Int Computation	Pearson Edit McGraw Hill, Genetic A Press,2021 and Applica	ucation, 20 2017. Algorithms ations, 1 <sup>st</sup>	20. synthesi Edition, on, Cam	"CRC
1. Stuart Rus 2. Elaine Rici 3. S. Rajase application ference Books 1. Cherry Bha 2. S. Kanimo Press,2021 3. Wolfgang E 4. David Poo University F 5. Chris Thorr	ekaran, C s",15 <sup>th</sup> Ed argava," A ozhi Sugu Ertel," Intro le and Al Press, 201	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artificial A. Vijayalakshmi Pai, "Neural Neition, PHI Learning Private Limited,201" rtificial Intelligence Fundamentals and Ana, M.Dhivya, Sra Paiva, "Artificial Intelligence", 2 <sup>nd</sup> Edan Mackworth," Artificial Intelligence: 7.	odern Approcial Intelliger tworks, Full.  Applications' ntelligence ition, Spring	ach", ace", 3 zzy , 1 <sup>st</sup> E Rece er, 20	4 <sup>th</sup> Edition, Brd Edition, Manager Logic and Edition, CRC Int Trends Int Computation	Pearson Edit McGraw Hill, Genetic A Press,2021 and Applica	ucation, 20 2017. Algorithms ations, 1 <sup>st</sup>	20. synthesi Edition, on, Cam	"CRC
1. Stuart Rus 2. Elaine Rici 3. S. Rajase application ference Books 1. Cherry Bha 2. S. Kanimo Press,2021 3. Wolfgang E 4. David Poo University F 5. Chris Thorr	ekaran, C s",15 <sup>th</sup> Ed argava," A ozhi Sugu Ertel," Intro le and Al Press, 201	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artificial Neinight, and Shivashankar B. Nair, "Artificial." Neural Neition, PHI Learning Private Limited, 2012 rtificial Intelligence Fundamentals and Anna, M.Dhivya, Sra Paiva, "Artificial Intelligence", 2 <sup>nd</sup> Edian Mackworth," Artificial Intelligence.	odern Approcial Intelliger tworks, Full.  Applications' ntelligence ition, Spring	ach", ace", 3 zzy , 1 <sup>st</sup> E Rece er, 20	4 <sup>th</sup> Edition, Brd Edition, Manager Logic and Edition, CRC Int Trends Int Computation	Pearson Edit McGraw Hill, Genetic A Press,2021 and Applica	ucation, 20 2017. Algorithms ations, 1 <sup>st</sup>	20. synthesi Edition, on, Cam	"CRC
1. Stuart Rus 2. Elaine Rici 3. S. Rajase application eference Books 1. Cherry Bha 2. S. Kanimo Press,2021 3. Wolfgang B 4. David Poo University F 5. Chris Thorr	ekaran, C s",15 <sup>th</sup> Ed argava," A ozhi Sugu Ertel," Intro le and Al Press, 201 aton, Bene	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artificial Neinight, and Shivashankar B. Nair, "Artificial."  G.A. Vijayalakshmi Pai, "Neural Neition, PHI Learning Private Limited,2012  rtificial Intelligence Fundamentals and Anna, M.Dhivya, Sra Paiva, "Artificial Intelligence", 2nd Edian Mackworth," Artificial Intelligence: 7.  edict Du Boulay," Artificial Intelligence the	odern Approsial Intelliger etworks, Fu 1. Applications' ntelligence ition, Spring Foundation	ach", ace", 3 zzy , 1 <sup>st</sup> E Rece er, 20	4 <sup>th</sup> Edition, Brd Edition, Manager Logic and Edition, CRC Int Trends Int Computation	Pearson Edit McGraw Hill, Genetic A Press,2021 and Applica	ucation, 20 2017. Algorithms ations, 1 <sup>st</sup>	20. synthesi Edition, on, Cam	"CRC
3. S. Rajase application eference Books  1. Cherry Bha 2. S. Kanimo Press,2021 3. Wolfgang E 4. David Poo University F 5. Chris Thorreb References 1. https://www	ekaran, C s",15 <sup>th</sup> Ed argava," A bzhi Sugu Ertel," Intro le and Al Press, 201 aton, Bene	Peter Norvig, "Artificial Intelligence: A Monight, and Shivashankar B. Nair, "Artificial A. Vijayalakshmi Pai, "Neural Neition, PHI Learning Private Limited,201" rtificial Intelligence Fundamentals and Ana, M.Dhivya, Sra Paiva, "Artificial Intelligence", 2 <sup>nd</sup> Edan Mackworth," Artificial Intelligence: 7.	odern Approsial Intelliger etworks, Fu 1. Applications' ntelligence ition, Spring Foundation	ach", ace", 3 zzy , 1 <sup>st</sup> E Rece er, 20	4 <sup>th</sup> Edition, Brd Edition, Manager Logic and Edition, CRC Int Trends Int Computation	Pearson Edit McGraw Hill, Genetic A Press,2021 and Applica	ucation, 20 2017. Algorithms ations, 1 <sup>st</sup>	20. synthesi Edition, on, Cam	"CRC

\* TE – Theory Exam, LE – Lab Exam

3. https://www.geeksforgeeks.org/artificial-intelligence/

https://towardsdatascience.com/

5. https://www.coursera.org/

CO's	Prog	Program Outcomes (POs)												am Spec mes (PS	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	-	2	2	(-1°)	171411	TL D	1 - 74 2	The State of	_	2	3	2	2
2	3	3	-	2	-	-	-	-	-	1	-	2	2	3	2
3	3	3	3	2	2	-	-	-	11 - 21 - 1	_	-	2	3	3	2
4	3	2	2	3	3	2	-	_	-	-	_	2	3	3	2
5	2	3	3	2	2	2	2	-	1214	-	-	3	3	3	2

		Cont	inuous Assess	M)	End		
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Computer S	Science and Engineering	Progran	nme: B.	Tech				
Semester	V		Course	Catego	y: PC	E	nd Semeste	er Exam Ty	pe: <b>TE</b>
Course Code	U23CSTC07		Peri	ods/Wee	ek	Credit	Maxi	mum Mark	S
			L	Т	Р	С	CAM	ESE	TM
Course Name	WEB DESIG	INING	3	0	0	3	25	75	100
		(Commor	n to CSE and	AI&DS)					
Prerequisite		edge in Programming and Dat						-	
		etion of the course, the stud						BT Ma (Highest	
Course		terpret the concepts of HTML			and desi	igning web p	age	K	
Outcomes	,	oply client-side programming uterpret the concepts of PHP to			ocess th	ne form data	in web	K	
	pa	iges		•		io ioiiii data		1	_
		oply PHP scripts to handle and						K	
LINUT I		pply the web hosting procedure	es to nost a w	eb appi	ication ii			K	3
UNIT - I		, Html and CSS				Periods:09		Le Le	
HTML: HTML Syr	ntax – Structure on to CSS: CS	ld wide web – DNS – URI are of HTML Documents – HTM SS Syntax – Location of Styl Elements.	<b>ML</b> Elements:	Headin	ıgs – Liı	nks – Image	s – Lists –	Tables -	CO1
UNIT - II	Javascript					Periods:09	)		
Methods - Arrays	- Array Meth	- Variables – Operators – Da ods – Conditions – Loops – rties –Object Methods– Objec	Popup Alert	unction: – Even	s – Obje ts – Eve	ects – String ent Listener.	Methods - JavaScript	- Number Objects:	CO2
UNIT - III		to PHP and Forms	c Diopidy.			Periods:09	)		
String - IfElse	Elseif – Switch g Bootstarp – I	Data Types – Constants – E n – Loops – Arrays – Functio Form Validation – Form Requi	ons - Super	globals	- RegE	x. PHP For	m: Form H	andling –	CO3
UNIT - IV		tabase Connectivity				Periods:09			
	sing the Datab	al SQL – Creating a MySQL [ ase in PHP – Updating Datab							CO4
UNIT - V	Web Hosting					Periods:09		<u></u>	
		eating the website – Working ublishing web sites – Maintain			ing ema	ail and acce	ss other we	ebsites -	CO5
Lecture Periods:4	15	Tutorial Periods: 0	Practica	l Period	ds: 0		Total Perio	ods:45	
Text Books						L			
2. Steven Holzne	er, "PHP: The C	Hoar, "Fundamentals of Web Complete Reference", McGraw JQuery: Interactive Front–End	Hill Education	n, 3 <sup>rd</sup> Ed	dition, 20	020.	d Edition, 20	022.	
<ol> <li>Nixon Robin, '3.</li> <li>Laura Lemay,</li> <li>Alex Libby, Ga 2<sup>nd</sup> Edition, 20</li> </ol>	'Learning PHP, Rafe Colburn, aurav Gupta, A 16.	Script on Things: Hacking Hai MySQL & JavaScript: With jQ "Mastering HTML, CSS & Jav soj Talesra, "Responsive Web on to JavaScript object notation	Query, CSS & ascript Web", Design with	HTML5' BPB Pt HTML5	", O'Reil ublicatio and CS	lly Media, 5 <sup>th</sup> ns, 1 <sup>st</sup> Editio S3 Essential	Edition, 20 n, 2016. s", Packt Pu	18. ıblishing,	
Web References									
<ol> <li>https://www.w</li> <li>https://www.sr</li> <li>https://alistapa</li> <li>https://css-trick</li> </ol>	3schools.com/s nashingmagazi nt.com/article/n ks.com/tag/viev	ine.com/2021/03/complete-gui nobile-first-css-is-it-time-for-a-		e-front-e	nd-com <sub>l</sub>	ponents/			

COs						ram C			•				Prog Outc	ram Spo omes (P	ecific (SOs)
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	-	3	-	2	-	-	_	2	-	2	2	_	1	2
2	3	-	3	1	2	-	-	-	_	_			_	1	2
3	2	-	3	-	2	1	-	1.		-	_	_		1	2
4	2	-	3	2	2	2	-	2	-	_	_	_	_	1	2
5	2	-	3	1		1	_	2	_	-	_	1_		1	2

		Cor	ntinuous Asses	sment Marks (C	AM)	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	ter Science and Engineering Programme: B.Tech.								
Semester	V		Cour	se Cate	egory:	PC	End S	Semester	Exam Typ	oe: LE
Course Code	U23CS	P503	Perio	ds/We	ek	Cred			um Marks	
			L	Т	Р		С	CAM	ESE	TM
Course Name	CLOUI	COMPUTING LABORATORY	0	0	2		1	50	50	100
		C	SE		<u> </u>					
Prerequisite	NIL									
		mpletion of the course, the stude	nts will	be abl	e to				BT Map	
		mpletion of the course, the stude		3 2 2004 2		//ware v	vorkstat	ion.	BT Map (Highest <b>K</b> 3	Level)
Course	On cor	Construct various virtualization tools	such as	Virtual		Лware v	vorkstat	ion.	(Highest	Level)
Course Outcomes	On cor	Construct various virtualization tools Construct a web application in a Page	such as S enviro	Virtual nment.	Box, VN		vorkstat	ion.	(Highest <b>K3</b>	Level)
	On cor	Construct various virtualization tools	such as S enviro nplemer	Virtual nment. nt new s	Box, VII	ers.		ion.	(Highest K3 K3	Level)

#### List of Exercises

- Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top of windows 7 or 8.
- Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
- Install Google App Engine. Create hello world app and other simple web applications using python/java.
- Use GAE launcher to launch the web applications.
- Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
- Write a procedure to transfer the files from one virtual machine to another virtual machine.
- Write a procedure to launch virtual machine using trystack (Online Openstack Demo Version)
- Install Hadoop single node cluster and run simple applications like word count.
- Deploy a static website using Amazon S3.
- 10 Set up a Virtual Private Cloud (VPC)

Lecture Periods:0	Tutorial Periods:0	Practical Periods:30	Total Periods:30
Reference Books	**************************************		

- Stephen Baron," AWS: The Complete Beginner's Guide", 1st edition, 2020.
- Todd Koff," Learn the secrets of AWS, AZURE, GCP, and K8S",1st Edition, 2017.
- 3. Lizhe Wang, Rajiv Ranjan, Jinjun Chen, and Boualem Benatallah," Cloud Computing: Methodology, Systems, and Applications", 1st Edition, CRC Press, 2017.
- 4. Arshdeep Bahga and Vijay Madisetti," Cloud Computing: A Hands-On Approach", 1st Edition, Create Space independent publications, 2014.
- Derrick Rountree and Ileana Castrillo," Understanding the Fundamentals of Cloud Computing in Theory and Practice",1st edition, Syngress publications, 2013.

#### Web References

- https://aws.amazon.com 1.
- https://codered.eccouncil.org/course/a-practical-introduction-to-cloud-computing
- https://www.kyndryl.com/in/en/services/
- https://www.tutorialspoint.com/a-practical-introduction-to-cloud-computing/
- https://www.ibm.com/topics/cloud-computing

COs/POs/PSOs Mapping

COs	Prog	Program Outcomes (POs)												gram Spo comes (P	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	2	3	-	-	-	-	-	-	2	3	2	2
2	3	3	3	3	3	-	-	-	-	-	-	2	3	3	2
3	3	3	3	3	3	-	-	-	-	-	-	2	3	3	2
4	3	3	3	2	3	-	-	-	-	-	-	2	3	3	2
5	3	2	2	3	3	-	-	-	-	-	-	2	3	3	2

Correlation Level: 1-Low, 2-Medium, 3-High

	) A	Continuous	Assessm	nent Marks (CAM)	)		
	Performance	in practical	classes			End Semester	Tatal
Assessment	Conduction of practical	Record work	viva	Model Practical Examination	Attendance	Examination (ESE) Marks	Total Marks
Marks	15	5	5	15	10	50	100

Department	Comp	outer Science and Engineering	Progra	mme: I	B.Tech.						
Semester	V		<u></u>		ory: PC	End Se	mester Exa	m Type:	IF		
Course Code	U23C	SPC05	<del>†</del>	iods/W		Credit					
O-1	ADTIE	ICIAL INTELLICENCE	<u>L</u>	T	P	С	CAM	ESE	TM		
Course Name		FICIAL INTELLIGENCE PRATORY	0	0	2	1	50	50	100		
		(Common to	CSE, IT a	nd CC	E)						
Prerequisite	Basics	of Algorithms and Probability			,			J.			
	On c	ompletion of the course, the stu						BT Ma (Highes	apping t Level		
Course	CO1	Apply Search Algorithms to imp algorithms like Greedy Best First graph-based problems.	lement ai Search, A	nd com *, and /	pare he	uristic-bas olve pathf	ed search inding and	K	3		
Outcomes	CO2	Solve CSPs with Backtracking to mo Problems (CSPs) such as N-Queens	s or Sudok	II IIIsina	hacktrack	cina tochni	auco	K	3		
	CO3	inference engines, leveraging First-0	ts will deve Order Logi	lop forw	ard and b	oackward o	chaining	K	3		
	CO4	4 Markov Models, and Kalman Filters for probabilistic reasoning and sequence prediction tasks.									
ist of Exercise	CO5	Make use of AI in different application	ns.					K	3		

- 1. Implement Greedy Best First Search and A\* Search for pathfinding problems (e.g., solving a grid-based puzzle).
- 2. Model a classic Constraint Satisfaction Problem (e.g., N-Queens problem or Sudoku) and solve using backtracking.
- Implement AO\* search for a graph-based problem.
- Develop an inference engine using forward chaining and backward chaining to deduce conclusions from a given set of facts and rules.
- 5. Implement basic inference techniques in First-Order Logic using forward and backward chaining for an Al-based decision-making task.
- 6. Construct a Bayesian Network for a real-world problem (e.g., medical diagnosis) and perform inference using conditional probabilities.
- 7. Implement a Hidden Markov Model for sequence prediction (e.g., weather prediction or speech recognition).
- 8. Simulate a Kalman Filter for a tracking or navigation problem (e.g., predicting object positions over time).
- 9. Implement basic belief functions and apply Dempster-Shafer theory for uncertainty modeling in a decision-making problem.
- 10. Develop a model to predict stock price movements using historical data

Lecture Periods: 0	Tutorial Periods: 0	Practical Periods:30	Total Periods:30
Reference Books		· · · · · · · · · · · · · · · · · · ·	

- 1. Cherry Bhargava," Artificial Intelligence Fundamentals and Applications", 1st Edition, CRC Press, 2021.
- 2. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", 4th Edition, Pearson, 2020.
- 3. Elaine Rich, Kevin Knight and Shivashankar B. Nair, "Artificial Intelligence", 3rd Edition, McGraw Hill Educations, 2017.
- 4. Chris Thornton, Benedict Du Boulay," Artificial Intelligence through Search",4th Edition, Springer Netherlands,2012.
- S.Rajasekaran, G.A.Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms synthesis and applications", 15th Edition, PHI Learning Private Limited, 2011

#### Web References

- 1. https://www.tutorialspoint.com/artificial\_intelligence/index.html
- 2. https://www.javatpoint.com/artificial-intelligence-ai
- 3. https://www.geeksforgeeks.org/artificial-intelligence/

	Program Outcomes (POs)											- 1 faj. 37.	Program Outcomes		Specific (PSOs)
co's	DO1	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12									PSO1	PSO2	PSO3		
		PUZ	F 0 3	104	1 00			-	2	12.1.	_	2	3	3	2
1	3	3	3	2	2	-							2	2	3
2	3	3	3	3	2	-	-	-	2	-	-	2	3	3	3
							-		2		_	2	3	3	3
3	3	3	3	3	2	- T		Lu		l					
	2	2	2	2	2	_	-	_	2	V =	-	2	3	3	3
4	3	3	3	3								-	-	2	3
5	3	2	3	2	2	-	-	-	2			2	3	3	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluatio	n Method			, i	,		
	Co	ontinuous <i>i</i>	Assessn	nent Marks (CAI	VI)		
Assessment	Performar cl	ice in prac	tical	Model		Total Marks	
	Conduction of practical	Record work	viva	Practical Examination	Attendance	Examination (ESE) Marks	K Sign Sign Sign Sign Sign Sign Sign Sign
Marks	15	5	5	15	10	50	100

Department	Com	outer Science and Engineering	Prograr	nme: B.	Tech.						
Semester	V	- * * * * * * * * * * * * * * * * * * *	Course		Semester I	Exam Type: LE					
Course Code	U23C	SPC06	Periods		. ,	Credit		um Marks			
			L	Т	Р	С	CAM	ESE	TM		
Course Name	WEB	DESIGNING LABORATORY	0	0	2	1	50	50	100		
		(CSE	and AI&D	 S)	L	1	L		<u> </u>		
Prerequisite	Basic	Basic knowledge in Programming and Database									
	On co	empletion of the course, the stu	dents will					BT Ma (Highest			
Course	CO1	Construct and display webpage wit	h HTML an	d CSS e	lement	S		K			
Outcomes	CO2	Develop JavaScript programming for	or website	creation							
	CO3	Build PHP Forms		K3							
	CO4	Develop Database Connectivity usi	K3 K3								
	CO5	Utilize PHP applications for Web ho	sting					ļ			
List of Exercise			Jamiy					K3	<u>}</u>		

- (a) Design a home page which displays information about your college department using headings, HTML entities and paragraphs.
  - (b) Create a webpage for any clinic using marquee and HTML formatting tags.
- 2. Design a timetable and display it in tabular format.
- 3. Design an admission form for any course in your college with text, password fields, drop-down list, check-boxes, radio buttons, submit and reset button etc.
- 4. Design a web page of your home town with an attractive background color, text color, an image, font face by using Inline CSS formatting.
- 5. (a) Design a web page by using different CSS border styles.
  - (b) Demonstrate the use of CSS Box Model.
- 6. Write a JavaScript program to remove a character at the specified position of a given string and return the new string.
- 7. Develop and demonstrate a HTML file that includes JavaScript script for taking a number n as input using prompt and display first n Fibonacci numbers in a paragraph.
- 8. Design HTML form for keeping student record, apply JavaScript validation in it for restriction of mandatory fields, numeric field, email-address field, specific value in a field etc.
- 9. Write a program in PHP for processing a simple form (use controls like checkbox, radio buttons and options).
- 10. Write a program in PHP for a simple POST and GET functions
- 11. Design a login form using cookies, bootstrap, PHP, Database.
- 12. Design a student form with add, update, delete, display all and search option using student database

Lectur	e Periods:	0	Tutorial Periods:0	Practical Periods:30	Total Periods:30
Refere	nce Books			<u> </u>	
1	Lyza Dange	er Gardn	er. "Java Script on Thin	igs. Hacking Hardware for V	

- 1. Lyza Danger Gardner, Java Script on Things: Hacking Hardware for Web Developers", Dreamtech Press, 1st Edition, 2018.
- 2. Laura Lemay, Rafe Colburn, "Mastering HTML, CSS and Javascript Web", BPB Publications, 1st edition, 2016.
- 3. Keith Wald, Jason Lengstorf, "Pro PHP and jQuery", Paperback, 2016.
- 4. Steven Suehring, Janet Valade, "PHP, MySQL, JavaScript & HTML5 All-in-One", John Wiley and Sons Inc, 2013.
- Leon Atkinson," Core PHP Programming: Using PHP to Build Dynamic Web Sites", Paperback, 2000.

#### Web References

- https://www.w3schools.com/php/DEFAULT.asp
- 2. https://www.tutorialspoint.com/php/index.html
- 3. https://www.phptpoint.com/php-tutorial/
- https://www.javatpoint.com/php-tutorial
- 5. https://www.w3schools.com/html/default.asp

		111111111111111111111111111111111111111	nes (P	Os)								Program Speci Outcomes (PSOs)					
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			PSO3			
3	3	3	3	3	3	3	3	-	2	3		3	2	7303			
3	3	3	3	-	3	_	3		2		2	0	3	3			
2	2	2	2	2	2	2	2		2			2	2	-			
-				- 2	. 2	3	3	4.5	3	3	_	2	2	2			
2	2	2	2	2	2	-	3	-	3	_	3	3	3				
3	3	3	3	3	3	3	3	10	3	2	2	0	3	<del>_</del>			
	3 2 2 3	3 3 3 2 2 2 2 2 3 3 3	3 3 3 3 3 3 2 2 2 2 2 2 2 3 3 3	3     3     3     3       3     3     3     3       2     2     2     2       2     2     2     2       3     3     3     3	3     3     3     3       3     3     3     3       2     2     2     2     2       2     2     2     2     2       2     2     2     2     2       3     3     3     3     3	3     3     3     3     3       3     3     3     3     3       2     2     2     2     2       2     2     2     2     2       2     2     2     2     2       3     3     3     3     3	3     3     3     3     3     3       3     3     3     3     3     3       2     2     2     2     2     2     3       2     2     2     2     2     2     2       3     3     3     3     3     3     3	3     3     3     3     3     3     3     3       3     3     3     3     3     3     3     3       2     2     2     2     2     2     3     3       2     2     2     2     2     2     3     3       3     3     3     3     3     3     3       3     3     3     3     3     3     3	3     3 <td>3     3<td>3     3<td>3     3<td>3         -         2         3         -         2         3         3</td><td>3         3</td></td></td></td>	3     3 <td>3     3<td>3     3<td>3         -         2         3         -         2         3         3</td><td>3         3</td></td></td>	3     3 <td>3     3<td>3         -         2         3         -         2         3         3</td><td>3         3</td></td>	3     3 <td>3         -         2         3         -         2         3         3</td> <td>3         3</td>	3         -         2         3         -         2         3         3	3         3			

Correlation Level: 1-Low, 2-Medium, 3-High

	C	ontinuous	,					
Assessment	Performar c	nce in prac	tical	Model		End Semester	Total	
,	Conduction of practical	Record work	viva	Practical Examination	Attendance	Examination (ESE) Marks	Marks	
Marks	15	5	5	15	10	50	100	

Department	Comp	puter Science and Engineering Programme: B. Tech.									
Semester	V		Cour	se Cate	gory Co	de: PA	*End Se	mester	Exam Type: -		
Course	112309	SW501	Periods / Week Credit Ma				Maxim	um Marks			
Code	02300		L	Т	Р	С	CAM	ESE	TM		
Course Name	MICRO	O PROJECT	0	0	2	1	100	-	100		
	-	CSE									
Prerequisite	Progra	ogramming Languages, Databases									
	On co		BT Mapping (Highest Level)								
Course	Identify the problem statement for the micro project work through the literature								K2		
Outcomes CO2 Choose the proper components as per the requirements of the designments system.							gn/	K2			
	CO3	Apply the acquainted skills to deve		К3							

There shall be a Micro Project, which the student shall pursue as a team consists of maximum 4 students during the third year, fifth semester. The aim of the micro project is that the student has to understand the real time hardware / software applications. The student should gain a thorough knowledge in the problem he/she has selected and in the hardware / software he/she using in the Project. The Micro-project is an application that should be formally initiated and should be developed and also to be implemented by the respective team.

The Micro Project shall be submitted in a report form along with the hardware model / software developed, duly approved by the department internal evaluation committee. It shall be evaluated for 100 marks as Continuous Assessment. The department internal evaluation committee shall consist of faculty coordinator, supervisor of the project and a senior faculty member of the department. There shall be two reviews that will be considered for assessing a Micro Project work with weightage as indicated evaluation Methods.

Lecture Periods: 0 Tutorial	Periods: 0 Practical Periods:	30 Total Periods: 30
-----------------------------	-------------------------------	----------------------

COs/POs/PSOs Mapping

COs		Program Outcomes (POs)											Program Specific Outcomes (PSOs)		
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	2	-	-	-	-	3	3	-	1	1	1	1
2	3	3	3	2	2	2	2	2	3	3	3	1	2	2	2
3	3	2	2	1	-	2	-	-	3	3	3	1	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

151		Review 1	v 1 Review 2						
Assessment	Novelty	Presentation	Viva	Presentation	Demonstration	Viva	Report	Total Marks	
Marks	10	20	10	20	20	10	10	100	

2. A.3. 48

Department	Computer Science and Engineering	Prograr	nme : <b>B.</b>	Tech					
Semester	V	Course	Category	/ Code: AEC	*End Se	emester	Exam T	ype: -	
Course Code	U23CSC5XX		Period	s/Week	Credit	*End Semester Exam Typ Credit Maximum Marks C CAM ESE			
	023030377	L	Т	Р	С	CAM	ESE	TM	
Course Name	CERTIFICATION COURSE – V	0	0	4	-	100	-	100	
		CSE	4			.ii			

Students shall choose an International / Reputed organization certification course of 40-50 hours duration specified in the curriculum (It is mandatory to do a minimum of six courses) which will be offered through the Centre of Excellence. These courses have no credit and will not be considered for CGPA calculation.

- (i) Certification Courses are required to be completed to fulfil the degree requirements. All Certification courses are assessed internally for 100 marks.
- (ii) The Course coordinator handling the course will assess the student through attendance and MCQ test, and declare the student as "pass" on satisfactory completion. A letter grade "P" is awarded to declare pass.
- (iii) The marks scored in these courses will not be taken into consideration for the SGPA / CGPA calculation in the grade sheet.

Assessment	Continuous Assessme	Continuous Assessment Marks (CAM)						
Assessment	Attendance	MCQ Test	Total Marks					
Marks	10	90	100					

Department	Computer Science and Engineering	Pi	ogramn	ne: <b>B.Te</b>	ch.			
Semester	V	ļ		ategory (		C *F		
Course	U23CSM505		Period	s/Week	Credit	·	id Semes	ter Exam Type: -
Code		L	······				ximum Ma	arks
Course	ESSENCE OF INDIAN		T	Р	C	CAM	ESE	TM
Name	TRADITIONAL KNOWLEDGE	2	0	0	-	100	-	100
Prerequisite	- Comm	ion	to ALL I	Branches				
	On completion of the course, the stud	dent	s will b	e able to	)			BT Mapping
Course	CO1 Familiarize with the philosophy of Indi	ian c	ulture					(Highest Level
Outcomes	OOZ DISHINGUISH the Indian language and	litor	oturo					K1
	CO3 Learn the philosophy of ancient medi	eval	and mo	dern India				K2
-	The tine	arte	in India					K1
JNIT- I	COS Know the contribution of scientists of	diffe	rent eras					K1
	introduction to Culture				Period	ds:06		K1
iterature, civiliza iterature, India	ation, culture and heritage, general characte an Culture, Ancient India, Medieval India, Mod	uem	mora	ture, imp	ortance o	of culture	in human	CO1
1411-11	Ingian Languages, Culture and Liter	-4			Period	ls:06	<u>L</u>	
indian Langua	ides and literature - I the role of Seculit		~	of scripture	i	***************************************	he last:	
Indian language	other Sanskrit literature, literature of south liges & literature.	ndia	Indian L	anguages	and Lite	ent socie	ly, indian	000
NIT- III				3300	and Litt	rature-II.	Northern	CO2
	Religion and Philosophy				Perio	ds:06	<u>l</u>	
Movements in	Philosophy in ancient India, Religion and Modern India (selected movements only)	Philo	sophy i	n Mediev	al India	Religious	Poform	
NIT- IV					,	rtongious	reloilli	CO3
The state of the s	Fine Arts in India (Art, Technology a	nd I	Engine	ering)	Perio	ds:06	<u>I</u>	
ndian Painting	I. IIIIIIAII DADOICTATTE Muicio divinione et l. 19						Donos	
levelopment o	f science in ancient, medieval and modern In	l m dia.	odern),	Science	and Tec	hnology i	n India,	CO4
	Education System in India				Periods	s:06	L	
uucation in ai	ncient, medieval and modern India, aims cient India, Science and Scientists of Medieva	of ed	ducation	subjects			200 024	
cture Period	The Colonida of Mediev	al In	dia, Scie	ntists of N	lodern In	dia.	ice and	CO5
eference Boo	rutorial Perions: II	rac	tical Pe	riods: 0			l Periods	
. M. Hirivani	OKS					i i Ota	enous	
NCERT, "F Kapil Kapo S. Narain, ' Satya Prak B References		eatre on",	ita Bhart ",1 <sup>st</sup> Edit 1 <sup>st</sup> Editio	Publishe ion, NCEI n, D.K.Pr	r, 2007. RT, 2006 int world,	2005.		
https://nptel.a	ac.in/courses/109/104/109104102/ ac.in/courses/101/104/101104065/ ac.in/courses/109/108/109108158/ ac.in/courses/109/106/109106059/						-	

COs					Prog	gram O	utcome	es (POs	;)				Prog	ram Spe	cific
- 1	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	DOG	DO 40				omes (P	SOs)
1	1				. 00	. 00	101	PU6	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3
2			-	-	-	-		-	-	3	-	1	1		
2	1	-	-	-	-	_		_		_		-	ı	-	1
3	1	-	_	_						3	-	1	1	-	1
4	1	_				-		-	-	3	-	1	1	_	1
5	1				-	-	-	-	-	3	-	1	1		1
A STATE OF THE PARTY OF THE PAR	-4:				-	- - High	=	-	-	3	_	1	1	_	

Assessment	Contin	uous Assessment	Marks (CAM)	
A COCCOMICATO	Attendance	MCQ Test	Presentation / Activity /	Total Marks
Marks	10	30	Assignment	

# PROFESSIONAL ELECTIVE COURSES

	Compute	er Science and Engineering	Progra	mme: <b>E</b>	3.Tech				
Semester	V		Course	Categ	ory: PE	E	nd Semeste	er Exam Ty	pe: <b>TE</b>
Course Code	U23CSE	506	Peri	ods/We	eek	Credit	Max	imum Mar	ks
			L	Т	P	С	CAM	ESE	TM
Course Name	PROGR/	AMMING IN C#	3	0	0	3	25	75	100
			CSE	<u> </u>	L		.1	<u> </u>	
Prerequisite	Basic kr	nowledge of OOPS concepts						=	
	On com	npletion of the course, the stu	dents wi	ll be ab	le to			BT Map (Highest	
	CO1	Understand the concept of .N	et framev	vork.				K2	2
Course	CO2	Demonstrate the fundamental co	ncepts us	ing C#.				K2	2
Outcomes	CO3	Understand the Programming Co	onstructs u	sing C#				K2	2
	CO4	Develop the Graphical User Inter	face using	C#.				K3	
	CO5	Build the Database Connectivity	using ADC	NET.				K3	
UNIT - I		guage Fundamentals	doning 7 to 0	····		Periods	··09		
rocess – Assemb Expressions- Opera	ly and its ty ators- Progr	CLR) – Common Type System (CT ypes – Namespaces – Command l am control statements- Program: co	ine compi	ler. C#	Basics:	Literals- V	ariables- Da culator progr	ta Types-	СО
UNIT - II		Oriented Programming	anlandina					itanaa	~~
Polymorphism - Pro	ogram: cour	<ul> <li>Strings – Methods- Operator ov nt duplicate elements in an array - 0 ta for an employee.</li> </ul>							CO
UNIT - III		nming Constructs				Periods	:09		•••••
terator - Exception	s Handling the user er	lue Types and Reference Types- I - Multithreading – Delegates and E nters non-numeric values - Read a exist - Create a blank file on the disk	vents - File file path fr	e I/O - F om the i	Program user and	: Divide two I tries to op	numbers a	nd handle	CO3
UNIT - IV		s & Window Forms				Periods	:09		
Programming GDI+	- Develop	r Control – Menu – Tool Bar – Too an application to implement multiple						Graphics	CO4
			tools for	aesignin	g grapri			L	
UNIT - V		se Programming				Periods			
Data Access with A	ADO.NET -	se Programming - Architecture – Data reader – Da XML Based Data Sets. Enterprise E	ta Adapte dition Ove	r – Com rview –	nmand - Multi-Ti	Periods - Connection er Architect	on – Data S ure – Best P		COS
Data Access with A Binding – Data Grid Comparison betwee	ADO.NET - d Control - ) en J2EE and	se Programming - Architecture – Data reader – Da XML Based Data Sets. Enterprise E d .NET - Develop an interactive app	ta Adapte dition Ove	r – Com rview – connect	nmand - Multi-Ti t databa	Periods - Connection er Architect	on – Data S ure – Best P ADO.NET.	ractices –	CO
Data Access with A Binding – Data Grid Comparison between Lecture Periods:	ADO.NET - d Control - ) en J2EE and	se Programming - Architecture – Data reader – Da XML Based Data Sets. Enterprise E	ta Adapte dition Ove	r – Com rview – connect	nmand - Multi-Ti t databa	Periods - Connection er Architect	on – Data S ure – Best P	ractices –	CO
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Fext Books	ADO.NET - d Control - ) en J2EE and :45	se Programming  - Architecture – Data reader – Da  XML Based Data Sets. Enterprise E  d .NET - Develop an interactive app  Tutorial Periods: 0	ta Adapte dition Ove blication to <b>Practic</b>	r – Com erview – connect al Peri	nmand - Multi-Ti t databa <b>ods: 0</b>	Periods - Connection er Architect se through	on – Data S ure – Best P ADO.NET.	ractices –	CO
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Fext Books	ADO.NET - d Control - 2 en J2EE and d:45 ts ,"Implement	se Programming  - Architecture – Data reader – Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive approperation of the Tutorial Periods: 0  enting C# 11 and .Net 7.0 ",1st Edition of the Program of	ta Adapte Edition Ove Dication to Practic	r – Comerview – connect al Peri	nmand - Multi-Ti t databa <b>ods: 0</b>	Periods - Connection - Connection - Architect se through	on – Data S ure – Best P ADO.NET. Total Per	ractices –	CO
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Fext Books  I. Fiodar sazanaver  B. E.Balagurusamy,  B. Christian Nagel,	ADO.NET - d Control - 2 en J2EE and e.45 ts ,"Impleme , "Programn Bill Evjen, J	se Programming  - Architecture — Data reader — Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive approximate Tutorial Periods: 0  enting C# 11 and .Net 7.0 ",1st Editining in C# Primer",2nd Edition ,Tata ay Glynn, "Professional C# 2008",4	ta Adapte Edition Ove Dication to Practic  on, BPB P McGraw-F # Edition,	r – Comerview – connect al Peri ublicatio	nmand - Multi-Tie t databa ods: 0	Periods - Connection - Connection - Architect se through	on – Data S ure – Best P ADO.NET. Total Per	ractices –	CO
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Ext Books . Fiodar sazanavel E. E.Balagurusamy, b. Christian Nagel, . Mark Michaelis, "	ADO.NET - d Control - 2 en J2EE and e.45 ts ,"Impleme , "Programn Bill Evjen, J	se Programming  - Architecture – Data reader – Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive appropriate Tutorial Periods: 0  enting C# 11 and .Net 7.0 ",1st Editioning in C# Primer",2nd Edition ,Tata	ta Adapte Edition Ove Dication to Practic  on, BPB P McGraw-F # Edition,	r – Comerview – connect al Peri ublicatio	nmand - Multi-Tie t databa ods: 0	Periods - Connection - Connection - Architect se through	on – Data S ure – Best P ADO.NET. Total Per	ractices –	CO
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Fext Books  Fiodar sazanavet  E. E.Balagurusamy,  B. Christian Nagel,  Mark Michaelis, "  Reference Books	ADO.NET - d Control - ) en J2EE and e45 ts ,"Impleme , "Programn Bill Evjen, J 'Essential C	se Programming  - Architecture – Data reader – Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive approximate Tutorial Periods: 0  enting C# 11 and .Net 7.0 ",1st Editioning in C# Primer",2nd Edition ,Tata ay Glynn, "Professional C# 2008",4 #2.0",2nd Edition, Pearson Education	ta Adapte Edition Ove Dication to Practic On, BPB P McGraw-F th Edition, on,2005.	r – Comerview – connectical Peri ublication dill Eduction	nmand - Multi-Tion t databa ods: 0 ons, 2020 eation Pvolus Pvolus Pvt I	Periods - Connection - Connection - Architect se through	on – Data S ure – Best P ADO.NET. Total Per	riods:45	
Data Access with A Binding – Data Grid Comparison betwee Lecture Periods: Fext Books . Fiodar sazanavet E. E.Balagurusamy, B. Christian Nagel, Mark Michaelis, "Reference Books . Gabriel Baptista	ADO.NET - d Control - 2 en J2EE and c45 ts ,"Implement, "Programn Bill Evjen, J 'Essential C	se Programming  - Architecture – Data reader – Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive approximate Tutorial Periods: 0  enting C# 11 and .Net 7.0 ",1st Editioning in C# Primer",2nd Edition ,Tata ay Glynn, "Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations as Abbruzzese, "Hands-On Software Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Parket Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Parket Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Professional C# 2008",4 #2.0",2nd Edition, Pearson Educations are considered as Abbruzzese, "Hands-On Software Professional C# 2008",4 #2.0",2nd Edition Pro	ta Adapte Edition Ove Dication to Practic  on, BPB P McGraw-H th Edition, nn,2005.  ware Archi	r – Comerview – connectical Periodication dill Eduction Wiley In	nmand - Multi-Tid t databa ods: 0 ons, 202 eation Pv dia Pvt l	Periods - Connection - Connection - Architect se through	on – Data S ure – Best P ADO.NET. Total Per	riods:45	
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Fext Books  I. Fiodar sazanaver  B. E.Balagurusamy,  B. Christian Nagel,  J. Mark Michaelis, "  Reference Books  I. Gabriel Baptista solutions using mich	ADO.NET - d Control - 2 en J2EE and ts ,"Implement , "Programn Bill Evjen, J tEssential C and France roservices, I	se Programming  - Architecture — Data reader — Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive approximate Tutorial Periods: 0  enting C# 11 and .Net 7.0 ",1st Editioning in C# Primer",2nd Edition ,Tatalay Glynn, "Professional C# 2008",4 #2.0",2nd Edition, Pearson Education esco Abbruzzese, "Hands-On Softwood DevOps, and design patterns for Azimus ML Professional C# 2008",4 Period Edition, Pearson Education DevOps, and design patterns for Azimus ML Professional C# 2008",4 Period Edition, Pearson Education DevOps, and design patterns for Azimus ML Professional C# 2008",4 Period Edition, Pearson Education DevOps, and design patterns for Azimus ML Professional C# 2008",4 Period Edition Pearson Education DevOps, and design patterns for Azimus Professional C# 2008",4 Period Edition Pearson Education DevOps, and design patterns for Azimus Period Peri	ta Adapte Edition Ove Dication to Practic  on, BPB P McGraw-F th Edition, on,2005.  vare Archi cure Cloud	r – Comerview – connected Periodication Hill Educe Wiley In tecture 7, 1st Ed	nmand - Multi-Tion t databactory ons, 2020 eation Pvoidia Pvt I	Periods - Connection - Connecti	on – Data S ure – Best P ADO.NET.  Total Per  T Core 3: A tions, 2019.	riods:45	
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Fext Books  I. Fiodar sazanaver  B. E.Balagurusamy,  B. Christian Nagel,  I. Mark Michaelis, "  Reference Books  I. Gabriel Baptista solutions using micros." C#	ADO.NET - d Control - 2 en J2EE and ts ,"Implement , "Programn Bill Evjen, J tEssential C and France roservices, 1 # 8.0 and .N	se Programming  - Architecture — Data reader — Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive approximate Tutorial Periods: 0  enting C# 11 and .Net 7.0 ",1st Editioning in C# Primer",2nd Edition ,Tata ay Glynn, "Professional C# 2008",4 .#2.0",2nd Edition, Pearson Education DevOps, and design patterns for Az .ET Core 3.0 — Modern Cross-Platfor	ta Adapte Edition Ove Dication to Practic  on, BPB P McGraw-F Edition, on,2005.  vare Archi cure Cloud orm Develo	r – Comerview – connected Periodication Hill Educe Wiley In tecture 7, 1st Ed	nmand - Multi-Tion t databactory ons, 2020 eation Pvoidia Pvt I	Periods - Connection - Connecti	on – Data S ure – Best P ADO.NET.  Total Per  T Core 3: A tions, 2019.	riods:45	
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Fext Books  To E. Balagurusamy,  B. Christian Nagel,  Mark Michaelis, "  Reference Books  To Gabriel Baptista  Colutions using mice and the solutions using mice.  Mark J. Price, "C# in the solution of the soluti	ADO.NET - d Control - 2 en J2EE and ts ,"Impleme , "Programn Bill Evjen, J 'Essential C and France roservices, 1 # 8.0 and .N n depth", 3rd	se Programming  - Architecture — Data reader — Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive approached in the second of the second o	ta Adapte Edition Ove Dication to Practic  on, BPB P McGraw-F th Edition, on,2005.  ware Archi cure Cloud orm Develo	r – Comerview – connected Periodication will Educe Wiley In tecture openent", 1st Educe periodical Education periodi	nmand - Multi-Tion t databactory ons, 2020 eation Pvoidia Pvt I	Periods - Connection - Connecti	on – Data S ure – Best P ADO.NET.  Total Per  T Core 3: A tions, 2019.	riods:45	
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Text Books  I. Fiodar sazanavet  B. E.Balagurusamy,  B. Christian Nagel,  Mark Michaelis, "Reference Books  I. Gabriel Baptista  B. Glutions using micro  B. Mark J. Price, "C#  B. Joh Skeet, "C# in  B. Adrew Stellman a	ADO.NET - d Control - 2 en J2EE and ts , "Impleme , "Programn Bill Evjen, J 'Essential C and France roservices, l # 8.0 and .N n depth", 3 <sup>rd</sup> and Jennifel	se Programming  - Architecture — Data reader — Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive approximate approximat	ta Adapte Edition Ove Control Con, BPB P McGraw-I- The Edition, Con, 2005.  The Edition on the Edition on the Edition on the Edition on the Edition of the E	r – Comerview – connected Periodication will Educe Wiley In tecture will a specific tecture will be a spe	nmand - Multi-Tion t databa ods: 0 ons, 2025	Periods - Connection - Connecti	on – Data S ure – Best P ADO.NET.  Total Per  T Core 3: A tions, 2019.	riods:45	
Data Access with A Binding – Data Grid Comparison between Lecture Periods: Fext Books  Fiodar sazanaver  E.Balagurusamy,  Christian Nagel,  Mark Michaelis,  Reference Books  Gabriel Baptista olutions using micro  Mark J. Price, "C# in Joh Skeet, "C# in Adrew Stellman and Andrew Troelsen	ADO.NET - d Control - 2 en J2EE and ts , "Impleme , "Programn Bill Evjen, J 'Essential C and France roservices, 1 # 8.0 and .N n depth", 3 <sup>rd</sup> and Jennifel n, "Pro C# 5.	se Programming  - Architecture — Data reader — Data ML Based Data Sets. Enterprise Ed. NET - Develop an interactive approached in the second of the second o	ta Adapte Edition Ove Dication to Practic  on, BPB P McGraw-H Edition, on,2005.  vare Archi cure Cloud orm Develo 4. on, O'Reilly on edition, A	r – Comerview – connection of the connection of	nmand - Multi-Tid t databa ods: 0 ons, 202 eation Py dia Pyt I with C# ition, Pa 1st Editid	Periods - Connection - Connecti	on – Data S ure – Best P ADO.NET.  Total Per  T Core 3: A tions, 2019.	riods:45	

- https://www.mheducation.co.in/programming-in-c-9789351343189-india https://www.amazon.in/Programming-Primer-Balagurusamy-SECOND-636363/dp/B0C74FB9NJ https://www.w3schools.com/cs/index.php
- - \* TE Theory Exam, LE Lab Exam

COs			,			ram C				ده ار ع				ram Spo omes (F	
	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	2	2	-	-	-	2	-	-	2	3	2	2
2	3	3	3	3	2	-	-	-	2		-	2	3	2	2
3	3	3	3	3	2	-	-	-	2	-	-	2	3	3	2
4	3	2	3	2	2	-	-	-	3	-	-	2	3	3	3
5	3	3	3	3	3	2-0	11	- 1	3	1 1		2	3	3	3

		Cor	ntinuous Asses	sment Marks (C	AM)	End	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Semester	V					e: PE *End	Semester I	Exam Typ	oe: TE
Course Code	U23E0	CECO1	Period	W \ ab	·	Credit		imum Ma	
Jourse Code		7	L	T	Р	C	CAM	ESE	TM
Course Name	DIGIT	AL IMAGE PROCESSING	3	_ 0	0	3	25	75	100
		(Common to ECE,							
Prerequisite		nts should have an introduction to si				ivalent course	Э.	DTM	
-	On co	mpletion of the course, the stude	ents will be	able to	)			(Highes	apping
		Understand fundamentals, visual p	oorcontion a	nd nive	al relatio	nehine		···	2
	CO1						hala	.e	·
Course Outcomes	CO2	mathematical preliminaries	4 1 807 1		chnique				(3
Julcomes	CO3	Apply different types of image en applications							(3
	CO4	Segmentation techniques	of Colour	Imag			nd Imag		(4 (4
	CO5	explore image compression tech based on matching.	iniques, cod	ing me	ethods,	and pattern	recognitio		+
JNIT- I	Digita	l image Fundamentals				<u> </u>			iods: 0
ntroduction -	Origin -	- Steps in Digital Image Processing	g – Compon	ents -	Eleme	nts of Visual	Perceptio	n – Imag	e e <b>CO1</b>
Sensing and	Acquisit	tion – Image Sampling and Qua	intization –	Relation	onships	between pi	ixels., sim	pie imag	e
ormation mod	el, Brigh	tness, contrast, hue, saturation, Ma	ach band effe	ect		Т			
JNIT- II	lmage	Transform							iods: (
wo-dimension	nal Fou	rier Transform- Properties – Fast	Fourier Tran	sform	<ul><li>Invei</li></ul>	rse FFT- Ima	age transfo	orms – 1	CO
OFT, 2D DFT	, Discre	ete Cosine transform, Discrete Sir	ne transform	, Hada	amard	transform, H	aar transfo	orm, Slar	nt
ransform, KL	transfor	m, SVD transform, Wavelet transfor	rm.						<u>Al</u>
JNIT- III	Imag	ge Enhancement and Image Reston Vievel transformations – Histogran	oration			<u> </u>			iods: (
Sharpening S frequency dor Adaptive filter	patial F main filte s – Ban	iltering – Frequency Domain: Intro ers – Ideal, Butterworth and Gaussi id reject Filters – Band pass Filters m Notch Filtering – Inverse Filtering	duction to Fo ian filters. No s –	ourier oise mo	i ransto	rm – 5mooti	illig allu S	naipenni	g CO.
	Colo	our Image Processing and Image	Segmentation	on		T T		Per	iods: (
UNIT - IV	COIC	<ul> <li>Colour models – HIS to RGB ar</li> </ul>	nd RGB to H	IIS De	etection	of Discontin	uities- Ed	ge Linkin	g CO
Colour fundan	nentals	ction – Región based segment	tation- Morp	hologi	cal pro	ocessing- er	osion and	d dilatio	n.
and Bouridar	by mo	rphological watersheds – basic of	concepts - I	Dam o	construc	ction - Wate	ershed seg	gmentatio	in
	by IIIO	Thiological Watershous Sasis s							
algorithm. UNIT - V	Ima	ge Compression and Recognition						Per	iods: (
UNII - V	proccio	n – Coding Redundancy - Interpi	xel Redunda	ncv -	Psycho	visual Red	undancy -	Bit plar	ne co
need for com	hle lend	oth coding - Adaptive coding - Ari	thmetic codi	ng – L	ZW cod	ding – Hybrid	d coding -	Wavelet	- 00.
DEC MD	DIE IEIIQ	undary representation, Boundary	description.	Four	ier De	scriptor, Reg	gional Des	scriptors	4
JPEG - IVIPE	atura T	exture – Patterns and Pattern class	ses – Recoan	ition b	ased or	n matching.	· ·		
Lecture Perio		Tutorial Periods: 0	Practica	al Peri	ods: 0	T	otal Perio	ds: 45	
	us. 43	Tutona Tonoca.	L			L			
Text Books		nzalez & Richard E. Woods, "Dig	gital Image	Proces	sina".	4 <sup>th</sup> edition, P	earson E	ducation,	USA,
2017		Fundamentals of Digital Image Proc							
<ol><li>Kenne</li></ol>	eth R," C	eastleman, Digital Image Processing	,1 <sup>st</sup> Edition,	Pears	on Edu	cation, 2006.			
Reference Bo	oks	F. Brent Neal,"The Image Processing	a Handhaala	7th E4:	tion CP	C Press Taylo	r & Francis	Group.20	16.
2. Rafael	C. Gonz	zalez, Richard E. Woods, Steven L. Edd	dins, "Digital In	nage P	rocessin	ig Using MATE	Ab , 3° Eui	tion, rata	Mc Gra
3. Malay 4. P.Ram	K. Pakhi nesh Bab	ra, "Digital Image Processing and Patte u, "Digital Image Processing",1 <sup>st</sup> Edition	n, Scitech Publ	ications	Edition, F s, 2003.	PHI Learning P	Pvt. Ltd., 201	11.	
5. Willia	n K Prati	t, "Digital Image Processing",1st Edition,	John Willey, 2	2002.					
Mah Deferen			And the second s						

Web References

- http://eeweb.poly.edu/~onur/lectures/lectures.html
- 2. http://www.caen.uiowa.edu/~dip/LECTURE/lecture.html
- 3. https://nptel.ac.in/courses/117/105/117105079/
- 4. https://nptel.ac.in/courses/117/105/117105135/
- 5. https://www.csie.nuk.edu.tw/

COs	Progra				1.9	Little							Program Outcom	n Specifi	c e)
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	2	12.1			orres in			3112 0.3			1002	1303
_	-							, -1 1 <b>-</b> 21 1-1	10 -0 0	- 1	die inn	- 291	2	2	-
2	3	2	2	2	-	-	-	7-1	-	-	-	_	2	2	
3	3	2	2	2				Lucle 1.	-10	Sec. 110 . 14	ALC: U	1 1	2	2	-
				2	-	-	-	-	-	-	N		2	2	_
4	3	2	2	2									THE PERSON		
			1.5			_	* d	0.400	A114, 10	(B.F. 1	CO. *100	Liph Co.	2	2	-
5	3	2	2	2							-				
	لـــــــا	elation	-	2		-	-	-	-	-	_	-	2	2	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Accoment		Cont	inuous Asses	ssment Marks (CAM	)	End Semester	nru
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application-oriented / Problem-solving / Design / Analytical in content beyond the syllabus

<sup>\*</sup> TE - Theory Exam, LE - Lab Exam

Department	Computer Science and Engineering	Prograi	nme: <b>E</b>	3.Te	ch.					
Semester	V	Course	Categ	ory	Code	e: <b>PE</b>	,*En	nd Semest	er Exam	Гуре: <b>ТЕ</b>
Course Code		Peri	ods / V	Veel	<	С	redit	Ma	ximum Ma	arks
	U23CSE507	<u> </u>	T		P	ļ 	С	CAM	ESE	TM
Course Name	NETWORK SECURITY	CSE	0	-L	0	<u>L</u>	3	25	75	100
Prerequisite	Basic knowledge in Networks									
}	On completion of the course, the stude	ents will b	e able	to					BT Ma	nnina
19			o ubio					-	(Highes	
	CO1 Understand the need of Security Se								K2	
_ 6 -	CO2 Apply the different cryptographic cryptography	operatio	ns us	ing	pub	olic ar	nd priv	vate key	K3	
Course	CO3 Inspect solutions for effective key m	anageme	nt distr	ibut	ion a	and ma	intain	message!	K2	
Outcomes	integrity								132	
	CO4 Identify and use appropriate alg	orithms	or as	surir	ng S	System	secu	urity and	K3	
	authentication.  CO5 Outline the security requirements	and so	lutions	 for		roloco	notive	 orko ond'		
} 	distributed systems	and so	iutions	101	VVII	61622	netwo	orks and	K2	
b	Introduction						ds: 9			
Security Attack	- Non-cryptographic Protocol Vulnerabilitie	es - Soft	ware \	/uln	erab	ilities	- The	need for	security	7
	s - Security Mechanisms- Classical encrypti	on: Class	cal Ted	chni	ques					CO1
	Symmetric and Asymmetric Cipher						ds: 9			<del></del>
Blowfish - BC5	ers: Symmetric and asymmetric cryptograp	hy- Key s	ize an	d Ke	ey R	ange-	DES	- Triple D	ES -AES	I company to the
Knapsack Algori	<ul> <li>Pseudorandom Number Generators - As ithm - Differential and Linear Cryptanalysis-N</li> </ul>	ymmetric Jumber Ti	Cipne	rs:	RSA	Algor	itnms	- Security	of RSA	CO2
UNIT-III	Key Management and Data Integrity Alg		ieory.		17.77	Perio	de. 9			<u>i</u>
Diffie Hellman k	ey exchange -Elgamal Cryptographic Syster		. Curve	- Ar	ithme			Curve Cry	ntography	<del>_</del>
- Cryptographic	Hash Functions: Secure Hash Algorithm (SF	IA-1) -Me	ssage	auth	enti	cation	codes:	: HMAC.	ptographi	СОЗ
	Authentication					Perio				
Digital Signature	es -Elgamal Digital Signature Scheme - N	NST Digit	al Sigi	natu	re A	Igorith	m - E	Iliptic Cur	ve Digita	
Service - Public	ithm – RSA-PSS Digital Signature - Biom Key Infrastructure	etric Autr	ientica	tion	– K	Cerbero	os - X	509 Auth	entication	CO4
UNIT-V	Network and Wireless Security's					Perio	ds: 9			<del></del> -
Email Security:	Pretty good privacy – S/MIME-IP Security -	- Web Se	curity:	SSI	_/ Tr	anspo	rt Laye	er Security	· - Secure	 ;
electronic transa	action (SET) -System Security- Firewalls	design p	rinciple	es. I	ntru	sion d	etectio	n System	n - Virtua	CO5
Case Studies: S	s - Wireless security: IEEE 802.11 overview a Snort and Stenographic tools - Bit coin and C	and its se Crypto cur	curity - rency s	- VVI	EP -	WPA.				
Lecture Periods		Practical					Tot	tal Periods	: 45	
Text Books	in and the control of									
2017.	lings, "Cryptography & Network Security-	- Principi	es and	d P	racti	ces",7	<sup>tn</sup> Edit	tion, Pear	son Pub	lishers,
		ition McG	raw Hi	II 2	011					
	gs, "Network Security Essentials: Application					ition, F	Prentice	e Hall.200	7.	
Reference Books										
	Pfleeger, Shari Lawrence Pfleeger, "Security									
	lings, "Network Security Essentials: Applicat							tice Hall, 2	2007.	
<ol> <li>Douglas R.</li> <li>Wenbo Mao</li> </ol>	Stinson, "Cryptography: Theory and Practice on, "Modern Cryptography: Theory and Practic	e ,کי¤ Editi مr 1st ⊏م:	on, CR	C p	ress	,2006. Iali De	D 2001	2		1
5. Charlie Kau	ufman, Radia Perlman, and Mike Specine	r. "Netwo	rk Sec	urit\	/· PI	iaii PT RIVATI	11,2003 F Com	o. Imunicatio	n in a D	LIBLIC
	Edition, Prentice Hall, 2002.	.,	500	~ i it)		21 V/ 31 1	_ 0011	mamoade	л шаг	SDLIO
										1

#### Web References

- 1. https://www.coursera.org/learn/crypto
- 2. https://www.mitel.com/articles/web-communication-cryptography-and-network-security
- 3. http://williamstallings.com/Cryptography/Crypto7e-Student/
- 4. http://www.maths.usyd.edu.au/u/afish/Math2068/index\_lectures.html

\* TE - Theory Exam, LE - Lab Exam

COs/POs/PSOs Mapping

COs					Pro	gram	Outco	nes (P	Os)					ram Spe omes (P	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	2	2	-	-	7 0	2	-	-	1	2	2	2
2	3	3	3	3	3	-	-	-	2	-	-	2	3	3	2
3	3	3	2	3	2	-	-		2	-	-	1	3	2	2
4	3	3	3	3	3	-	E.	-	3	-	-	2	3	3	3
5	3	3	2	2	3	-	-	-	3	-	-	2	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

		Cor	itinuous Asses	sment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

		uter Science and Engineering	Progran	nme: B	.Tech	-			
Semester	V		Course	Catego	ry: PE	End Se	emester E	xam Type	: TE
Course Code	U23C5	SE508	Periods	/Week		Credit	Maxim	um Marks	3
			L	T	P	С	CAM	ESE	TIV
Course Name	Open-	Source Programming for IOT	3	0	0	3	25	75	100
Prerequisite	Basic I	knowledge in Programming and N	letworks		1 4				211.
	On co	mpletion of the course, the stud	dents will	be ab	e to			BT Ma (Highest	
	CO1	Identify key IoT platforms and la	nguages.					K	3
Course	CO2	Develop real-time IoT applicatio	ns with Py	/thon/N	licroPyt	hon		K	3
Outcomes	CO3	Build IoT applications and dashl	ooards us	ing Noc	de.js.		М	K	3
	CO4	Develop analytics systems with	Julia.					K	3
	CO5	Inference secure, scalable IoT s		ith Rus	st/Go.			K4	ļ
UNIT - I		Source IOT Platforms and Prog				Periods:09	9		
Arduino and C/C- UNIT - II Introduction to Py	++ – Weath Pytho	Concepts –Latency – Throughput ner Station Project. n and Micropython for IOT Appl	lications			Periods:0			
MicroPython on sensors – Visual	tandard P ESP8266 izing data	<ul> <li>Basics of Python and its role in loython – Setting Up Python and Micand ESP32 – Requirements for realusing Python libraries – Case Stud</li> </ul>	roPython - time data	<ul> <li>Installi process</li> </ul>	ng Pythe ing – C	on on Raspbonnecting and	erry Pi – S d reading o	etting up lata from	CO2
MicroPython on sensors – Visual BH1750 ambient	tandard P ESP8266 izing data light senso	ython – Setting Up Python and Mic and ESP32– Requirements for real- using Python libraries – Case Stud or with ESP32/ESP8266.	roPython - time data	<ul> <li>Installi process</li> </ul>	ng Pythe ing – C	on on Raspb onnecting and ight monitorin	erry Pi – S d reading o ng system o	etting up lata from	CO2
MicroPython on sensors — Visual BH1750 ambient UNIT - III Overview of Java development env Real-Time Data (using Node.js.	tandard P ESP8266 izing data light senso Real-T Script and ironment –	ython – Setting Up Python and Mic and ESP32– Requirements for real- using Python libraries – Case Stud or with ESP32/ESP8266. Time IoT with Node.js Node.js for IoT – Setting Up Node.js Using Node.js with IoT Devices – Intation with Node.js – Case Study – Cre	roPython - time data ly - Devel for IoT - I regrating se	- Installi process op a re- nstalling	ng Pything – Cral-time I  Node.js	on on Raspbonnecting and ight monitoring Periods:09 on IoT platforators – Handli to monitor an	erry Pi – S d reading of g system of g rms – Confing asynchro d visualize	etting up lata from using the iguring the onous I/O	CO3
MicroPython on sensors — Visual BH1750 ambient UNIT - III Overview of Java development env Real-Time Data (using Node.js.	tandard PESP8266 izing data light senso Real-T Script and ironment – Communica	ython – Setting Up Python and Mic and ESP32– Requirements for real- using Python libraries – Case Stud or with ESP32/ESP8266. ime IoT with Node.js Node.js for IoT – Setting Up Node.js Using Node.js with IoT Devices – Intation with Node.js – Case Study – Create Processing using Julia	roPython - time data ly - Devel for IoT - I tegrating seleate a real-	- Installi process op a re- nstalling ensors a	ng Pytho ing – Co al-time I Node.js nd actua shboard	on on Raspbonnecting and ight monitoring Periods:09 on IoT platfoators – Handli to monitor an Periods:09	erry Pi – S d reading of ng system of g rms – Confing asynchro d visualize	etting up data from using the iguring the onous I/O- sensor dat	CO3
MicroPython on sensors — Visual BH1750 ambient UNIT - III Overview of Java development env Real-Time Data Cusing Node.js.  ÜNIT - IV Overview of Julia Installing Julia on — Implementing Implementing rea	tandard P ESP8266 izing data light senso Real-T Script and ironment – Communica IoT Da - Key fea loT platfor multi-threa	ython – Setting Up Python and Mic and ESP32– Requirements for real- using Python libraries – Case Stud or with ESP32/ESP8266. Time IoT with Node.js Node.js for IoT – Setting Up Node.js Using Node.js with IoT Devices – Intation with Node.js – Case Study – Cre	roPython - time data ly - Devel for IoT - I tegrating seleate a real- ntax and pr ne Julia en	- Installi process op a re- nstalling ensors a time da: ogramm vironme ced dat:	ng Pytheing – Ceal-time I  Node.js nd actual shoard  ing consent – Real a visual	on on Raspbonnecting and ight monitoring Periods:09 on IoT platforators – Handli to monitor and Periods:09 otructs – Setting I-Time Data Fization technical	erry Pi – S d reading of g system of g rms – Confing asynchro d visualize ng Up Julia Processing of iques using	etting up data from using the iguring the onous I/O- sensor dat for IoT — with Julia g Julia —	CO3
MicroPython on sensors — Visual BH1750 ambient UNIT - III Overview of Java development env Real-Time Data Ousing Node.js.  UNIT - IV Overview of Julia Installing Julia on Implementing Implementing reausing Julia.	tandard P ESP8266 izing data light senso Real-T Script and ironment - Communica IoT Da - Key fea IoT platfor multi-threa	ython — Setting Up Python and Mic and ESP32— Requirements for real- using Python libraries — Case Stud- or with ESP32/ESP8266.  Time IoT with Node.js  Node.js for IoT — Setting Up Node.js  Using Node.js with IoT Devices — Intation with Node.js — Case Study — Create Processing using Julia  tures and benefits for IoT — Basic synthy in the Raspberry Pi — Configuring the ding and asynchronous processing	roPython - time data ly - Devel for IoT - I tegrating seleate a real- ntax and pr ne Julia en	- Installi process op a re- nstalling ensors a time da: ogramm vironme ced dat:	ng Pytheing – Ceal-time I  Node.js nd actual shoard  ing consent – Real a visual	on on Raspbonnecting and ight monitoring Periods:09 on IoT platforators – Handli to monitor and Periods:09 otructs – Setting I-Time Data Fization technical	erry Pi – S d reading of g system of  ms – Confing asynchro d visualize  g Up Julia Processing of iques using ata analytic	etting up data from using the iguring the onous I/O- sensor dat for IoT — with Julia g Julia —	COS
MicroPython on sensors — Visual BH1750 ambient UNIT - III Overview of Java development env Real-Time Data (using Node.js. UNIT - IV Overview of Julia Installing Julia on — Implementing reausing Julia. UNIT - V Introduction to Ri Rust for IoT Dev (Golang) — Overview of Julia with Color of the Color of th	tandard P ESP8266 izing data light senso Real-T Script and ironment Communica IoT Da - Key fea IoT platfor multi-threa il-time mac RUST ust - Over relopment riew of Go	ython — Setting Up Python and Mice and ESP32— Requirements for realusing Python libraries — Case Student with ESP32/ESP8266.  Time IoT with Node.js  Node.js for IoT — Setting Up Node.js Using Node.js with IoT Devices — Interior with Node.js — Case Study — Creation with Node.js — Case Study — Creation with Node.js — Case Study — Creation with Reasonable for IoT — Basic synthesis and benefits for IoT — Basic synthesis and asynchronous processing thine learning models for IoT applications.	roPython - time data ly - Devel for IoT - I regrating served a real- ntax and prine Julia en i - Advanctions - Car reatures-Ru loT - Secretions - Kercommunic	- Installing process op a remarkalling ensors a stime data or service of the control of the cont	ng Pytheing – Ceal-time I  Node.js nd actual shboard  ing consent – Real a visual by – Development of the ces – Gootocols with the ces – Gootocols	Periods:09 ctructs – Setting Ill-Time Data Fization technication and Interior and I	erry Pi – S d reading of g system of g rms – Confing asynchro d visualize g ng Up Julia Processing of iques using ata analytic mbedded s Introduction lable IoT so etwork prog	etting up data from using the iguring the phonous I/O sensor data for IoT — with Julia g Julia — s system systems — on to Goolutions — ramming	COS
MicroPython on sensors — Visual BH1750 ambient UNIT - III Overview of Java development env Real-Time Data Cusing Node.js.  UNIT - IV Overview of Julia Installing Julia on — Implementing Implementing reausing Julia.  UNIT - V Introduction to Ricust for IoT Dev (Golang) — Overview of Julia	tandard P ESP8266 izing data light senso Real-T Script and ironment – Communica  IoT Da  - Key fea IoT platfor multi-threa al-time mad Ist – Oven relopment riew of Go ming with Go for real-	ython — Setting Up Python and Mice and ESP32— Requirements for realusing Python libraries — Case Student with ESP32/ESP8266.  Time IoT with Node.js  Node.js for IoT — Setting Up Node.js  Using Node.js with IoT Devices — Interior with Node.js — Case Study — Creation with Node.js — Case Study — Creation with Node.js — Case Study — Creation with Reaspherry Pi — Configuring the ding and asynchronous processing thine learning models for IoT application of Rust and its benefits — Key fer — Basics — Advantages of Rust in and its suitability for real-time application.	roPython - time data ly - Devel for IoT - I regrating served a real- ntax and prine Julia en i - Advanctions - Car reatures-Ru loT - Secretions - Kercommunic	- Installi process op a re- nstalling ensors a time da: ogramm vironme ced dat se Study est's role ure comey featur ation prop a secu	ng Pytheing – Ceal-time I  Node.js nd actual shboard  ing consent – Real visual	Periods:09 structs – Setting and elop an IoT date of an IoT platform of the periods:09 structs – Setting of the periods:09 structs – Setting of the periods:09 ecurity and elop an IoT date of the periods:09 ecurity and elop of the periods:00 ecurity and elop of the periods:00 ecurity and elop of	erry Pi – S d reading of g system of g rms – Confing asynchro d visualize g ng Up Julia Processing of iques using ata analytic mbedded s Introduction lable IoT so etwork prog	etting up data from using the iguring the onous I/O sensor data for IoT — with Julia y Julia — s system s — on to Go olutions — ramming em using	CO2

- 1.
- Malcolm Sherrington, "Mastering Julia: A Comprehensive Guide for Advanced Users",1st edition, Packt Publishing, 2022. Arshdeep Bahga and Vijay Madisetti," Internet of Things: A Hands-On Approach", 2nd Edition, McGraw-Hill Education, 2021.
- Patrick Mulder and Kelsey Breseman, Node.js for Embedded Systems: Using Web Technologies to Build Connected Devices,1st 3. Edition, Apress, 2021.
- Mihalis Tsoukalos," Mastering Go: Harness the Power of Go to Build Professional Utilities and Concurrent Servers and Services", Packt Publishing, 2020.
- 5.
- Pratik Desai, "Python Programming for Arduino",1st Edition, Packt Publishing, 2018.

  Jim Blandy and Jason Orendorff," Programming Rust: Fast, Safe Systems Development",1st Edition, O'Reilly Media, 2018.

#### Reference Books

- Nicholas H. Tollervey, "Programming with MicroPython: Get MicroPython Working for You on the Raspberry Pi Pico, ESP32, and Other Microcontrollers", 1st Edition, No Starch Press, 2021.
- Patrick Mulder and Kelsey Breseman, "Node.js for Embedded Systems: Using Web Technologies to Build Connected Devices",1st Edition, Apress, 2021.
- 3. Michael Margolis," Arduino Cookbook", 3rd Edition, O'Reilly Media, 2020.
- Chris Rackauckas and Shalabh Bhatnagar, "Julia Programming for Operations Research: A Primer on Computing", 1st Edition, Springer, 2018.
- Claus Matzinger, "Rust Programming By Example", 1st Edition, Packt Publishing, 2018.
- 6. Alan A. A. Donovan and Brian W. Kernighan, "The Go Programming Language", 1st Edition, Addison-Wesley Professional, 2015.

#### Web References

- 1. https://www.arduino.cc
- 2. https://docs.micropython.org/en/latest/
- 3. https://www.w3schools.com/nodejs/
- 4. https://julialang.org/
- 5. https://www.rust-lang.org
- 6. https://go.dev

<sup>\*</sup> TE – Theory Exam, LE – Lab Exam

COs		Program Outcomes (POs)										Program Specific Outcomes (PSOs)			
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	2	2	-	-	-0111	2	1 213	î - <u>-</u> -	1	2	2	1
2	3	3	3	3	3	- L	_7'- '	-	2	- 1	-	2	3	2	2
3	3	3	3	3	3			1.5	2	-	-	2	3	3	3
4	3	3	3	3	3	-	-	-	3	-	-	2	3	3	3
5	3	3	3	3	3	ara.	in End	·	3			2	3	3	3

tri i i i	Contin	uous As	sessment Mark	s (CAM)	d istantia	End	Mc-an-
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	outer Science and Engineering	Prog	ramme	: B.Tech				
Semester	V				egory: PE	End Se	mester	Exam Typ	ne. TF
Course Code	U23C	SE509		ds/We		Credit		num Mark	
			L	T	P	C	CAM	ESE	TM
Course Name	SOFT	WARE PROJECT MANAGEMENT	3	0	0	3	25	75	100
Drorowijoita		CS	Ē						
Prerequisite	-								
	On co	mpletion of the course, the studer	its will	be abl	e to			BT Ma (Highes	
	CO1	Understand Project Management a	ind plar	ning s	trategies			K	
Course	CO2	Build adequate knowledge about so effort estimationtechniques	oftware	proces	ss models a	nd softwa	re	K	3
Outcomes	CO3	Examine the risks involved in various	us proje	ect acti	vities			K	2
	CO4	Utilize the project monitoring and co						K	
	CO5	Simplify Staff selection process and				ple		K	
UNIT - I	Projec	management Et Evaluation and Planning				Periods	s-00		_
		nent – Categorization of Software Pro	iects –	Setting	ohiectives -			ncinles –	CO1
Management Cor	ıtrol – Pro	oject portfolio Management – Cost-bene epwise Project Planning	efit evalu	uation t	echnology –	Risk Eval	uation –	Strategic	COI
UNIT - II	Projec	t Life Cycle and Effort Estimation				Periods	s:09		<u> </u>
	Cycle –	Continue 1100000 und 110000	ss Mo	dels	– Rapid	Applicatio	n Dev	elopment	CO2
Basics of Softwar	e Estimati	ic System Development Method – Extre ion – Effort and Cost Estimation Technic	eme Pro aues — (	gramm COSMIC	ing – Manag C Full Functio	ing Interac	ctive Pro	cesses –	
Parametric Produc	ctivity Mod	del			, an i arroad	m pointo	- 1 may	10 II /\	
UNIT - III		y Planning, Scheduling and Risk N	_			Periods	4		
		ing – Project Schedules – Activities – Se							CO3
		Pass techniques – Critical path (CRM) m arlo Simulation – Resource Allocation – C						nitoring –	
UNIT - IV	<b>,</b>	oring and Control	Jealion	or Critic	ai Pallerris –	Periods			
		alizing Progress – Cost Monitoring – Ea	arned Va	alue An	alvsis – Prio			- Getting	CO4
Project Back to Ta	rget – Ch	ange Control - Managing Contracts - In	troduction	n – The	e ISO 12207	Approach	- Supply	Process	004
	ct – Stage	es in Contract Placement – Typical Terms	of a Co	ntract –	Contract Ma			ance	
UNIT - V		ing Peoples and Organizing Team		Doot	andbada of O	Periods			
The Oldham – Ha	e Frojeci: ackman .li	s – Managing People – Organizational B ob Characteristic Model – Stress – Hea	enavior -	- Best I	methods of S — Ethical an	tatt Selecti	ion – IVIO1	ivation –	CO5
		on Making – Organizational Structures –							
- Communication									
Lecture Periods	:45	Tutorial Periods: 0	Pract	ical Pe	riods: 0	Tota	al Perio	ds:45	
Text Books									
2. Bob Hughes," N 3. Maneesh Dutt, "	like Cotte Mind Map	Management Essentials You Always War erell and Rajib Mall ,Software Project Mar es for Effective Project Management", 1st	nagemer	it",5 <sup>th</sup> E	dition, Tata M	cGraw Hill	shers, 20 I, New De	20. elhi, 2017.	
Reference Book		"Droiget Managers 10 // A M			Oth Callette and				
		er, "Project Management, ISV: A Manage ct Management For Dummies", 5 <sup>th</sup> edition			e ⊏aition, W	ney, 2017.			
		"Managing Global Software Projects",14 <sup>th</sup>			w Hill Educat	tion (India)	. 2013.		
		ctive Software Project Management" ,1st					, _ ,		
5. Walker Royce,	"Software	Project Management",1 <sup>St</sup> Edition, Addiso	on-Wesle	ey, 1998	3.				
Web References	3								
1. https://www.pmi	.org/learn	ing/library/strategic-program-managemer	nt-office-	structur	e-4613				
2. https://www.simp	olilearn.co	m/project-estimation-techniques-article							
		com/software_engineering/software_proj	ect_mar	ageme	nt.html				
		n/software-project-management							
5. https://www.ge	ekstorgee	eks.org/software-engineering-software-p	project-r	nanage	ment-spm/				

<sup>\*</sup> TE – Theory Exam, LE – Lab Exam

					Pro	gram	Outco	mes (P	Os)				Program Specific Outcomes (PSOs		
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	2	2	_	2	2	3	-	2	1	2	2	1
2	3	3	3	2	2	-	2	2	3	-	2	1	2	3	2
3	3	3	3	3	3	2	2	3	3		2	2	2	3	2
4	3	3	3	3	3	2	2	3	3	-	2	2	3	3	3
5	2	3	3	2	2	3	2	3	3	-	2	2	3	3	3

	Continu		End Semester	Total			
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

# SEMESTER VI

2. A.3. 66

Department	Comp	puter Science	and Engineeri	ng	Program	nme: B	.Tech.					
Semester	VI				Course			e: <b>PC</b>	*Enc	Semest	er Exam T	ype: <b>TE</b>
Course Code	LICOLT	TC02			Perio	ds / W	eek	Cre			ximum Mar	
Course Code		TC03			u L	Т	Р	С		CAM	ESE	TM
Course Name	MACE	IINE LEARNIN			3	0	0	3		25	75	100
	T		Comi	mon to (	CSE, IT a	nd CC	E					
Prerequisite	Math	ematics		1								
	On c	ompletion of	the course, the	studen	its will be	e able	to				BT Ma (Highest	
	CO1	Explain the bas	sic concepts of ma	achine le	arning						K2	
	CO2	Apply supervis	ed algorithms for	different	classificati	on prob	olems				K	3
Course Outcomes	CO3	Explain the nee	ed for ensemble n	nethods					-		K2	2
Outcomes	CO4	Apply unsuper	vised and reinforc	ement le	arning tecl	nniques	to vario	us proble	ms		K3	<u> </u>
	CO5	Apply dimension	nality reduction a	nd optim	ization tec	hnique	S				K3	
Unit- I	<del> </del>	duction						Period	s: 09		170	,
Introduction: MacI	Å		of Machine Lear	nina Ann	lications: I	earnin	7 20000	i		ootios r	logrosi	
Unsupervised lear algorithms – Turn	rning – F	Reinforcement le	earning; Prelimina	ries: Wei	aht space	<ul><li>Curse</li></ul>	e of dime	ensionality	– Tes	sting mach	nine learning	CO1
Unit- II	4	rvised Learni						Period				L
Neural Networks regression; Multi-l	and Line ayer Pe	ear Discriminan rceptron: Forwa	ts: Brain and the rd and Backward	Neuron - propaga	<ul> <li>Neural r</li> <li>tion; Supp</li> </ul>	etwork ort Vec	s – Perc tor Mach	eptron – nines.	Linear	separabi	lity – Linear	CO2
Unit- III	Proba	abilistic Learr	ning, Learning	with Tre	es			Period	s: 09			<u>[</u>
Probabilistic Learn Classification and	ning: Ga Regres	aussian mixture sion trees – Cla	models – Neares ssification exampl	t neighbo le; Ensen	or methods nble Learn	; Learr ing: Bo	ning with	Trees: C Bagging	onstru – Ran	cting deci	sion trees – sts.	CO3
Unit- IV	Unsu	pervised Lea	rning, Reinforc	ement l	_earning			Period	s: 09			
Unsupervised: K-I selection – Policy	means a – Marko	algorithm; Reinf ov decision proc	orcement learnin ess – Values – SA	g: State ARSA an	and action d Q-learnin	n space	e – Rew	ard funct	ion –	Discounti	ng – Action	CO4
Unit- V	Dime	nsionality Re	duction, Optim	ization <sup>·</sup>	Techniqu	ies		Periods	s: 09			
Dimensionality Re squares optimizati	duction on – Co	Techniques: Lin onjugate gradien	ear Discriminant a ts – Search appro	analysis, l baches –	Principal C Exploitatio	ompon on and	ent Anal explorati	ysis; Optii on.	mizatio	on and Se	arch: Least-	CO5
Lecture Periods	s: 45	Tuto	orial Periods: 0		Practica	l Perio	ds: 0		Tot	al Perio	ds: 45	
Text Books								2# E				
			n to Machine Le	_				14110-110-1				
			Learning - An A ition Series, 201		mic Persp	ective	", 2" <sup>a</sup> E	dition, Cl	napm	an and F	lall/CRC M	achine
		1000	earning for Abso		ginners"	3 <sup>rd</sup> Edit	ion 20	21				
Reference Book		<u> </u>	24.1.1.18.10.7.200	rate be	511111613 75	Lan	.1011, 20					
<ol> <li>Jason Be</li> <li>Peter Fla</li> </ol>	ll, "Macl	hine learning – I	Hands on for Deve	elopers a	nd Techni	cal Pro	fessiona	ls", 1 <sup>st</sup> Ed	ition, V	Viley, 201	4.	
Press, 20		chine Learning.	The Art and Scie	nce of Al	gontnins t	nat ivia	ke Sens	e or Data	, 1° E	dition, Ca	mbriage Un	iversity
			earning systems v ng", McGraw-Hill				hing, 20	13.				
			nail, H T Lin, "Lear		550		k Publis	hers, 201	2			
Web References		,										
1. https://np	tel.ac.in.	/courses/106/10										
2. https://ww	w.cours	sera.org/learn/m arningmastery.c	achine-learning									
4. https://tov	vardsda	tascience.com/r	machine-learning/l									
5. https://ww	/w.analy	/ticsvidhya.com/	blog/2017/09/com	imon-ma	chine-lear	ning-al	gorithms	/				

COs					Prog	gram O	utcome	es (POs	;)				Prog Outc	ram Spe omes (P	cific SOs)
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3
1	3	2	2	-	-	-		100	-	-	-	-	3	1	1
2	3	2	2	-	-	-	-	-	-	-	-	_	3	1	1
3	3	2	2		-	-	-	-	-	-	-	-	3	1	1
4	3	2	2	-	-	-	-	-	-	-	-	-	3	1	1
5	3	2	2	-	-	-	-	-	-	-	-	-	3	1	1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

		Continuous	S Assessment N	/larks (CAM)		End Semester	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	10	)	5	5	5	75	100

<sup>\*</sup>Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Semester	Comp	outer Science and Engineering	Progran	nme: <b>B.</b>	Tech.				
	VI			Categor		End	Semester	Exam Type:	TE
	U23C	ST605		ods/Wee		Credit		ximum Mark	
Course Code			L	T	Р	C	CAM	ESE	TM
Course Name	DESIG	GNING AND BUILDING OF BOTS	3	0	0	3	25	75	100
	k		CSE						
Prerequisite	NIL								
	On co	empletion of the course, the stud				-		BT Map (Highest	
Course	CO1	Identify insights on robotic process au anywhere	tomation (	(RPA) te	chnolog	y and automa	tion	K	3
Course Outcomes	CO2	Apply the feature of Web Control Roo	m					K	3
	CO3	Categorize bots using bot Creator		***************************************				K4	ļ.
	CO4	Identify Metabot functionality						K	}
	CO5	Develop and Train IQ Bots						K3	}
UNIT - I		uction to Robotic Process Autor							,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Introduction to RPA a Components-RPA Lif	nd Use c ecycle– R	ases – Automation Anywhere Enterpris PA features and capabilities – Ways to	se Platforn create Bo	n (Contro ots	ol Room	, Bot Creator,	and Bot R	unner)- RPA	CO1
UNIT - II		Control Room and Client Dashboard (Home, Bots, Devices, Aud				Periods:09			
and Device Pools) - V	Vorkload figure Se	sks) - Bots (View Bots Uploaded and C (Queues and SLA Calculator) - Audit L ttings, Users, Roles, License and Mig	og (View A	Activities	Logged	I which are as	sociated w	ith Web CR	
UNIT - III	Bot C	reator				Periods:09		98	•
Command - Terminal	Emulator mand - M	<ul> <li>Loop Command – Excel Command Command - PDF Integration Command anage Windows Control Command - Was and Bot Insight</li> </ul>	- FTP Co	mmand	- PGP C	ommand - Ob	oject Clonin est Practice	g Command	CO3
	ot - Metal	Bot With Screen - MetaBot with DLL- In	troduction	to Bot I	nsight -	Transactional	Analytics -	Operational	CO4
UNIT - V	IQ Bot	İs				Periods:09			
Introduction to IQ Bo Performance and Mor	ots-Overvi nitoring- Ir	ew of Cognitive Automation-Setting integrating IQ Bots with Other Automatic	up and Ti on Anywhe	raining I ere Bots.	Q Bot-	Invoice Proc	essing with	ı IQ Bots –	CO5
Lecture Periods:45	j	Tutorial Periods: 0	Practic	al Perio	ds: 0	T	otal Perio	ds:45	
Text Books	'RPA Imn					<u></u>			
Published, 20 2. Will Neymar, 3. Alok Mani Tri	022. "Masterir ipathi, "Le	lementation Guide: A Practical Approac ng RPA with Automation Anywhere: Experning Robotic Process Automation: Cutomation Anywhere", 1st Edition, Packi	pert Guide	for Bot ware Ro	Develop bots and	ers", 1 <sup>st</sup> Editio	on, Apress,	2021.	
Published, 20 2. Will Neymar, 3. Alok Mani Tri Leading RPA Reference Books	022. "Masterir pathi, "Le Tool - Au	ng RPA with Automation Anywhere: Experning Robotic Process Automation: Cutomation Anywhere'', 1st Edition, Packi	pert Guide reate Soft t Publishin	e for Bot ware Ro ig, 2018.	Develop bots and	pers", 1 <sup>st</sup> Edition d Automate B	on, Apress, usiness Pro	2021. ocesses with	the
Published, 20 2. Will Neymar, 3. Alok Mani Tri Leading RPA  Reference Books 1. Chris Skinne 1st Edition, M	022. "Masterir ipathi, "Le i Tool - Au r, "Cognit arshall Ca	ng RPA with Automation Anywhere: Experning Robotic Process Automation: Cutomation Anywhere", 1 <sup>st</sup> Edition, Packing Automation and Robotic Process Automation International, 2020.	pert Guide reate Soft t Publishin utomation:	e for Bot ware Ro ng, 2018.	Develop bots and Digital T	pers", 1 <sup>st</sup> Edition  d Automate Boundary  ransformation	on, Apress, usiness Pro	2021. ocesses with al Services",	the
Published, 20 2. Will Neymar, 3. Alok Mani Tri Leading RPA  Reference Books 1. Chris Skinne 1st Edition, M 2. Rajesh K, "R	D22. "Masterir pathi, "Le Tool - Au r, "Cognit arshall Coobotic Pro	ng RPA with Automation Anywhere: Expering Robotic Process Automation: Cutomation Anywhere", 1st Edition, Packing Automation and Robotic Process Automation and Robotic Process Automation Anymocess Automation with Automation Anymocess Automation with Automation Anymocess	pert Guide reate Soft t Publishin utomation: where: Le	e for Bot ware Ro ng, 2018.	Develop bots and Digital T	pers", 1 <sup>st</sup> Edition  d Automate Boundary  ransformation	on, Apress, usiness Pro	2021. ocesses with al Services",	the
Published, 20 2. Will Neymar, 3. Alok Mani Tri Leading RPA  Reference Books 1. Chris Skinne 1st Edition, M 2. Rajesh K, "R and Impleme 3. Gerardus Blo	D22. "Masterir ipathi, "Le i Tool - Au r, "Cognit arshall Ca obotic Pro nt RPA B skdyk, "Ro	ng RPA with Automation Anywhere: Expanning Robotic Process Automation: Cutomation Anywhere", 1st Edition, Packing Automation and Robotic Process Automation and Robotic Process Automation Anymotes, 2020, 2020, 2021, 1st Edition, BPB Publications, 2020, 2020, 2021,	pert Guide reate Soft t Publishin utomation: where: Le. 0. Implemen	e for Bot ware Ro og, 2018. Al and arn the N	Develop bots and Digital T Nuts and	pers", 1st Edition d Automate Bransformation l Bolts of RPA	on, Apress, usiness Pro	2021. ocesses with al Services", o Design, Dooks, 2020.	the
Published, 20 2. Will Neymar, 3. Alok Mani Tri Leading RPA  Reference Books 1. Chris Skinne 1st Edition, M 2. Rajesh K, "R and Impleme 3. Gerardus Blo 4. Richard Murc	D22. "Masterir ipathi, "Le i Tool - Au r, "Cognit arshall Ca obotic Pro nt RPA B skdyk, "Ro doch, "Hal	ng RPA with Automation Anywhere: Expering Robotic Process Automation: Coutomation Anywhere", 1st Edition, Packing Automation and Robotic Process Automation and Robotic Process Automation and Robotic Process Automation with Automation Anymots", 1st Edition, BPB Publications, 2020 abotic Process Automation: A Guide to ands-On Robotic Process Automation (Robotic Process Automation)	pert Guide reate Soft t Publishin utomation: where: Le. 0. Implemen	e for Bot ware Ro og, 2018. Al and arn the N	Develop bots and Digital T Nuts and	pers", 1st Edition d Automate Bransformation l Bolts of RPA	on, Apress, usiness Pro	2021. ocesses with al Services", o Design, Dooks, 2020.	the
Published, 20 2. Will Neymar, 3. Alok Mani Tri Leading RPA  Reference Books 1. Chris Skinne 1st Edition, M 2. Rajesh K, "R and Impleme 3. Gerardus Blo 4. Richard Murc Automation A 5. Pascal Borne	D22. "Masterir ipathi, "Le i Tool - Au r, "Cognit arshall Ca obotic Pro nt RPA B lkdyk, "Ro doch, "Han anywhere' st, Ian Bar	ag RPA with Automation Anywhere: Expering Robotic Process Automation: Cutomation Anywhere", 1st Edition, Packing Automation and Robotic Process Automation and Robotic Process Automation Anywhere Automation Anymots", 1st Edition, BPB Publications, 2020 abotic Process Automation: A Guide to ands-On Robotic Process Automation (Right), 1st Edition, Apress, 2020. kin, Jochen Wirtz, "Intelligent Automation	pert Guide reate Soft t Publishin utomation: where: Le. 0. Implement RPA): Auto	e for Bot ware Ro ig, 2018. Al and arn the No ting RPA	Develop bots and Digital T Nuts and A System	pers", 1st Edition d Automate Bransformation Bolts of RPA ns", 1st Edition Tasks in the telephones	on, Apress, usiness Pro in Financia and How to the state of the state	2021. ocesses with al Services", o Design, Do ooks, 2020. with UiPath	the evelop,
Published, 20 2. Will Neymar, 3. Alok Mani Tri Leading RPA  Reference Books 1. Chris Skinne 1st Edition, M 2. Rajesh K, "R and Impleme 3. Gerardus Blo 4. Richard Murc Automation A	D22. "Masterir ipathi, "Le i Tool - Au r, "Cognit arshall Ca obotic Pro nt RPA B lkdyk, "Ro doch, "Han anywhere' st, Ian Bar	ag RPA with Automation Anywhere: Expering Robotic Process Automation: Cutomation Anywhere", 1st Edition, Packing Automation and Robotic Process Automation and Robotic Process Automation Anywhere Automation Anymots", 1st Edition, BPB Publications, 2020 abotic Process Automation: A Guide to ands-On Robotic Process Automation (Right), 1st Edition, Apress, 2020. kin, Jochen Wirtz, "Intelligent Automation	pert Guide reate Soft t Publishin utomation: where: Le. 0. Implement RPA): Auto	e for Bot ware Ro ig, 2018. Al and arn the No ting RPA	Develop bots and Digital T Nuts and A System	pers", 1st Edition d Automate Bransformation Bolts of RPA ns", 1st Edition Tasks in the telephones	on, Apress, usiness Pro in Financia and How to the state of the state	2021. ocesses with al Services", o Design, Do ooks, 2020. with UiPath	the evelop,

- - 2. https://www.ibm.com/topics/rpa
  - https://university.automationanywhere.com

  - https://www.edureka.co/blog/automation-anywhere-tutorial https://www.simplilearn.com/tutorials/automation-anywhere-tutorial
    - \* TE Theory Exam, LE Lab Exam

COs	Progr	am Ou	tcome	s (POs	;)									ram Spomes (F	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	2	1	1	1	-	-	-	-	-	2	2	2	1	-
2	2	2	1	1	1	_	-	-	-	-	2	2	2	1	-
3	2	3	2	2	2	<u>C</u> . "11	-	-	_	_	2	2	2	2	1
4	2	3	2	2	2	-		-	-	-	2	2	2	2	1
5	2	3	2	2	3	-	-	-	n=1	-	2	2	2	2	2

Ti.		Cor	ntinuous Asses	sment Marks (C/	AM)	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	outer Science and Engineering	Progra	mme: <b>B.</b>	Tech						
Semester	VI			Categor			End Como	-+ Г	. <b>.</b>		
Course Code	U23C	ST606	***************************************	s/Week	y. FC	Credit	End Seme:				
			L	T	Р	Credit	CAM	num Mari ESE	······		
Course Name	ANIM	ATION AND VISUAL EFFECTS	3	0	0	3	25	75	<b>TM</b> 100		
			CSE				20	/3	100		
Prerequisite	Basics	of Animation									
	On co	mpletion of the course, the stud	ents will k	e able t	0			RT M	apping		
			st Level)								
Course	CO1		<b>&lt;</b> 2								
Outcomes	CO2	Build Animation Effects using A						ŀ	<b>(3</b>		
outcomes	CO3	CO3 Examine Animation Effects using Premier Pro.									
	CO4	Understand Blender tools and D	esign cha	racter d	esian.				(4 (2		
	CO5	Develop the Models using Blend							(3		
UNIT - I		nd Animation				Periods	·n9				
VFX – Understa	nding VF	X – Brief History of VFX - Need fo	or Visual E	ffects –	Future			Pros &	CO1		
TO OF FIGURE	.110013 - /	TUDIICALIULIS OL VEX — COMPARISOL	1 hotwoon	VEV on	A A	1: A	imation - F	listory	COT		
UNIT - II	Lograine of Animation – Career in Animation – Pros & Cons of Animation.										
Usage of Platfori	m – Tools	s used - Plugins & Types - Impor	te & Evno	rto Mo		Periods:					
Traditing Troto	scoping -	- Color Play - Visual Effects - F	Render Ta	b & Adv	sking - ⁄ance	- Object D Option – I	uplication -	- Motion	CO2		
Encoder. UNIT - III						option i	Exploring t	o Media			
		ng Premiere Pro				Periods:	09		.4		
& its work – LUT	n – Diπe s & its ar	rence between After Effects & Preplication – Working with Creative	emiere Pro	– Effec	ts & P	resets Tab	– Audio S	plitting	CO3		
UNIT - IV	Introdu	iction to Blender & Tools	Curve – F	kender i	ab & A						
						Periods:	09				
Design – Using C	Other Des	standing Blender Interface & Tools	s – The Ble	ender Sc	ene - F	Project ove	erview & Ch	naracter	CO4		
UNIT - V	Blende	r Works				Periods:	19				
Modeling & its To	ols in Ble	ender – Character Modelling – Un	wrapping,	Painting	ı & Sh	aders – C	haracter R	aging	CO5		
& Animation – The Lecture Periods	c i tende	rage - Lighting & Composition.				44010 0	naraoter it	gging	CO5		
Text Books	:45	Tutorial Periods: 0	Practical	Period	s: 0	-	Total Peric	ds:45			
	ie Gyncild	"Adobo After Effects Ol	<b></b>								
Z. Maxim Jago, Au	obe Fiell	, "Adobe After Effects Classroom in a iere Pro Classroom in a Book", 1 <sup>st</sup> Ed	dition Poor	con Edua	ation 1	Press, 2024					
3. Jason van Gums Reference Books	ster, bier	der For Dummies", 2 <sup>nd</sup> Edition, John	Wiley & So	ns, 2011.	ation, 2	2022.					
		A.I.I. D.									
Edition, Adobe	Press. 20	Adobe Premiere Pro 2024: Complete	Step-by-St	ep Video	Editing	Course fo	r Beginners	& Veterar	าร '', 1 <sup>st</sup>		
2. Maxim Jago, "A	dobe Pre	miere Pro Classroom in a Book" 1st r	Edition, Add	be Press	s. 2024						
3. Oscal baechier	and Xury	Greer, "Blender 3D By Example" 2nd	Edition Pa	ockt Dubli	china C	000					
2019.	onrad Ch	avez, "Learn Adobe After Effects CC	for Visual E	ffects an	d Motic	on Graphics	s", 1 <sup>st</sup> Editior	ı, Peachpi	t Press,		
5. Chad Perkins,	"The After	Effects Illusionist: All the Effects in C	ne Comple	ete Guide	" 2 <sup>nd</sup> F	dition Rou	tledge 2017	7			
WCD IVEIGIGINGS						<u> </u>	1100g0, 2017	•			
<ol> <li>nttps://www.bloc</li> <li>https://www.rock</li> </ol>	panimatio	n.com/animation-for-beginners/	:								
5. https://www.prer	niumbeat.	om/blog/learn-5-simple-animation-tect com/blog/text-effect-premiere-pro/	nniques-eff	ects/							
<ol> <li>https://conceptar</li> </ol>	tempire.c	om/blender-animation-tutorials/									
5. https://www.visu	aleffectss	ociety.com/									
* TC Th-	C	1- 1-									

\* TE – Theory Exam, LE – Lab Exam

COs	Program Outcomes (POs)										Program Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	2	1	1	1	-	-	-	-	-	2	2	-		-
2	2	3	2	2	2	-	-	-	-	-	2	2	-	1-	1
3	2	3	2	2	2	-	-	-		-	2	2	-	-	1
4	2	3	2	2	2	-	-	-	-	-	2	2	1	-	1
5	2	3	2	2	2	-	-	-	-	-	2	2	1.	-	1

Assessment	Continu	uous Asse	End	Total			
	CAT 1	CAT 2	Model Exam	Assignment *	Attendance	Semester Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	uter Science and Engineering	Progran	nme: <b>B</b>	.Tech					1 6544
Semester	VI		Course	Catego	ry: PC		End Se	meste	r Exam T	ype: <b>TE</b>
Course Code	U23C	SB602	Periods	/Week		Credit	N	laximı	ım Marks	;
			L	Т	P	С	C	AM	ESE	TM
Course Name		KCHAIN CONCEPTS AND CATIONS	2	0	2	3		50	50	100
			CSE	***************************************		***************************************	1			
Prerequisite	1-11	48.41.41								
	On co	mpletion of the course, the stud	lents will b	e able	to			(1	BT Mapp Highest Le	5.
	CO1	Understand the fundamentals of B	lockchain.						K2	
Course	CO2	Identify the concepts of Cryptograp	ohy.						К3	
Outcomes	CO3	Analyze real-world case studies.							K4	
	CO4	Examine Blockchain concepts.							K4	
	CO5	Build the applications of Blockchair	n.						K2	
UNIT - I	Introd	uction to Blockchain				Periods	s:10			
application-Soft 8	Hard For	<ul> <li>History – CAP theorem and blockel</li> <li>Private and Public blockchain. Dist</li> <li>Attack-Energy utilization and altern</li> </ul>	ributed Con							CO1
UNIT - II		lation to Cryptography				Periods	s: <b>10</b>			
Algorithms: Mess UNIT - III Bitcoin - Introduct types— Bitcoin ins	age Diges Blocke ion – Transtallation –	<b>chain Applications</b> sactions types – The structure of a b - Bitcoin programming and the comm	lock– The g	enesis b	olock – T	Periods The bitcoin	::10 network- exchange-	- Walle Bitmar	ts and its	CO3
	,	Serializability – Recoverability – Trans	saction Isola	tion Lev	els –Sm	·		mated	contract.	
UNIT - IV		atory Exercises-I				Periods:	15			Т
<ol> <li>Impleme</li> <li>Impleme</li> <li>Impleme</li> <li>Impleme</li> </ol>	ntation of ntation of nting the r ntation of ionality of	constructing a Merkle tree with block Block construction using blockchain blockchain using Java programming running of the blockchain node several consensus techniques (such the network.  a blockchain token (e.g., ERC-20) and the properties of the second tree works.	Principles language Proof of Wo	ork and		Stake) an	d see hov	w they	affect	CO4
UNIT - V	Labora	atory Exercises-II				Periods	:15			
8. impleme 9. Impleme 10. Impleme 11. Impleme	nting block nt and cor nt the set- nt the bloc	Blockchain-based peer-to-peer netwook chain ideas to the development of a figure Go Ethereum and the Mist broup interoperability between different lockchain reentrancy attacks and learn bloy a simple smart contract on a bloo	a cryptocurre owser. Deve blockchains how to prev	lop and (e.g., P ent then	test a sa olkadot, n	ample app Cosmos).	olication	irt Chai	in.	CO5
Lecture Periods:3		Tutorial Periods: 0	Practical				Total Pe			
Text Books		***************************************					•			•••••••••••
<ol><li>Don Tap and the \lambda</li></ol>	scott and . Vorld", 2 <sup>nd</sup>	opoulos, "Mastering Bitcoin: Unlocking Alex Tapscott, "Blockchain Revolutio De Edition, Penguin, 2023. Be Basics of Bitcoins and Blockchains"	n: How the	Techno	logy Be	hind Bitco				siness,
4. William S	Stallings, "G	Cryptography and Network Security:	Principles a	nd Prac	tice", 8 <sup>th</sup>	Edition, P	earson, 2	.022.		
Reference Books										
4 D:-ID	!!F	Ola alcabaia Daniana A Niga Tari di di		·		d = 1:0:		~~~		

- 1. Daniel Drescher, "Blockchain Basics: A Non-Technical Introduction in 25 Steps", 2<sup>nd</sup> Edition, Apress, 2019.
- 2. Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli, "A survey of attacks on Ethereum smart contracts",1st Edition, Yellow Paper, 2016.
- 3. Wattenhofer, "The Science of the Blockchain", 1st Edition, CreateSpace Independent Pub, 2016.
- 4. Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", 1st Edition, O'Reilly Media, 2015.
- 5. DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger", 1st Edition, Yellow paper, 2014.

#### Web References

- https://www.thew3university.io/
- https://cryptozombies.io/
   https://decrypt.co/
- 4. https://unchainedcrypto.com/

COs/POs/PSOs Mapping

COs	Prog	ram C	utcon		Program Specific Outcomes (PSOs)										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	2	1	1	1		-	-	-	<u> </u>	-	<del></del>	1	2	3
2	2	2	2	1	1	-	-	-	-		_ 50_	4	2	2	3
3	2	2	2	2	2	-	-	-	-		-	-	3	2	1
4	2	3	3	2	2	-	-	-	-	-	-		2	2	2
5	2	3	2	2	2	-	-	-	-	- 3	2=:	-, ,	1	2	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High Evaluation Methods

**Evaluation Method** 

			Con	tinuous Asses	sment	Marks (CAM) -	Maximur	n 50 Ma	arks		,	
	Co	ontinuo	us Asse	ssment (Theo	ry)	Conti	inuous As	sessm	ent (Pra	ictical)	#F1	
Assessment	CAT	CAT 2	Model	Attendance	Total	Conduction of Practical	Report	Viva	Total	#End Semester Examination (ESE) Marks (Practical- Internal Evaluation)	#End Semester Examination (ESE) Marks (Theory)	Total Marks
Marks	5	5	5	5	20*	15	10	5	30*	= 15.1 UT	75**	100
*T	o be we	ighted f	or 10 Mar	rks	10	*To be weight	ted for 10	Marks	10	30	*To be weighted for 50 Marks	P

Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Com	puter Science and Engineering										
Semester	VI		Program Course (			PC	*End Semest	ester Exam Type: <b>LE</b>				
Course Code	U231	TPC03	Peri	ods / W	eek	Cred	it Ma:	ximum Marks				
			L	T	Р	С	CAM	ESE	TM			
Course Name	MACI	HINE LEARNING LABORATORY	50	50	100							
		Commor	Common to CSE, IT and CCE									
Prerequisite	Math	ematics										
	On co	mpletion of the course, the students						BT Mapp (Highest				
Course	CO1	Apply python packages and libraries	for various pr	oblems					(3			
Outcome	CO2	Apply supervised learning techniques	s for various p	roblems				K	.3			
	CO3	Develop an open-ended solution with world problem.				erns, for a	given real-	K				
	CO4	Apply unsupervised and reinforcemen	vunsupervised and reinforcement learning techniques for various problems K3									
	CO5	oply ensemble techniques to solve the problems and demonstrate the working of mensionality reduction methods  K3										

#### List of Exercises

- Working with Python packages Numpy, Scipy, Scikit-learn, Matplotlib
- Loan amount prediction using linear regression and visualize the interpretation

Handwritten character recognition using neural networks

Classification of Email spam and MNIST data using Support Vector Machines. 4.

Predicting Diabetes using decision tree

- Applications of Random Forest and AdaBoost ensemble techniques
- 7 K-means clustering for Euclidean distance metric

8. k-Nearest Neighbor algorithm

9. Applications of dimensionality reduction techniques on any dataset

10. Analyze any two supervised / unsupervised machine learning algorithms for any of the following real-time applications: (a) Text processing (b) Image processing (c) IoT systems

Lecture Periods: Tutorial Periods: Practical Periods: 30 Total Periods: 30

# Reference Books

- 1. Tom M Mitchell, "Machine Learning", 1st Edition, McGraw-Hill Education (India), 2017.
- 2. Jason Bell, "Machine learning Hands on for Developers and Technical Professionals", 1st Edition, Wiley, 2014.
- 3. Richert Willi, Luis Pedro Coelho, "Building machine learning systems with Python", 1st Edition, Packt Publishing, 2013.
- 4. Peter Flach, "Machine Learning: The Art and Science of Algorithms that Make Sense of Data", 1st Edition, Cambridge University Press, 2012.
- 5. Y S Abu-Mostafa, M Magdon-Ismail, H T Lin, "Learning from Data", 1st Edition, AML Book Publishers, 2012.

#### Web References

- https://nptel.ac.in/courses/106/105/106105152/
- https://www.coursera.org/learn/machine-learning
- https://machinelearningmastery.com/
- https://towardsdatascience.com/machine-learning/home/
- https://www.analyticsvidhya.com/blog/2017/09/common-machine-learning-algorithms/

# COs/POs/PSOs Mapping

COs	Progr	ram Ou	itcome	s (POs	Program Outcomes (POs)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	mes (PS PSO2	PSO3		
1	3	2	2	-	2	-	-	-	1	-		2	3	1	2		
2	3	2	2	-	2	-	-	-	1	-	_	2	3	1	2		
3	3	3	3	-	2	-	-	-	1	-	-	2	3	1	2		
4	3	2	3	-	2	-	-	-	1		_	2	3	1	2		
5	3	2	3	3	2	-	-	-	2	3	_	2	3	2	2		

Correlation Level: 1 - Low, 2 - Medium, 3 - High

<sup>\*</sup> TE - Theory Exam, LE - Lab Exam

	Continuous A	ssessment	Marks (C	AM)			
Assessment	Performance	in practica	l classes	Model		End Semester Examination	Total
	Conduction Record viva of practical		viva	Practical Examination	Attendance	(ESE) Marks	Marks
Marks	15	5	5	15	10	50	100

Department	Computer Science and Engineering	Program	me: <b>B.T</b>	ech.					
Semester	VI	Course (	Category	PC	Enc	Semester	Exam Type: <b>PE</b>		
Course Code	U23CSP604	••	ds/Week		Maximum Marks				
	district communication	L	Т	Р	С	CAM	ESE	TM	
Course Name	DESIGNING AND BUILDING OF BOTS LABORATORY	0	0	2	1	50	50	100	
		CSE	l	<u>.</u>					
Prerequisite	Nil								
	<u>-</u>								
	On completion of the course, the stud		be able	to			BT Map		
Cours			be able	to			(Highest	Level)	
Cours Outcomes	CO1 Identify insights of operations on Task CO2 Develop a bot to Automate extraction of	Bot.	be able	to			(Highest	Level) 3	
	CO1 Identify insights of operations on Task CO2 Develop a bot to Automate extraction of	Bot.	be able	to			(Highest K	Level) 3 3	
	CO1 Identify insights of operations on Task	Bot. If data	be able	to			(Highest	Level) 3 3	

- 1. Set up Automation Anywhere, explore the Control Room, and create your first basic Task Bot.
- 2. Create a Task bot to Automate data entry tasks (opening a Notepad, typing a simple text, and saving the file)
- 3. Create a bot to Automate extraction of data from an Excel file and copies to another application
- 4. Create a bot to automate the submission of a simple web form.
- 5. Automate the process of sending an email using a bot.
- 6. Create a bot to automatically launch a website every day at a specific time, such as opening a news website every morning.
- 7. Automate the process of assigning customer support tickets (stored in an Excel file) to different agents using queues.
- 8. Automate the process of logging into a web-based email account, checking for new messages, and logging out.
- 9. Create a bot to download files from an FTP server and loop through them to rename each file based on a specific pattern.
- Developing BOT to Create and deliver invoices.

Lecture Periods:	0	Tutorial Periods:	0	Practical Periods:30	Total Periods:30
Reference Books			***************************************	<u>k</u>	

- 1. Nandan Mullakara, Arun Kumar Asokan, "Robotic Process Automation Projects: Build real-world RPA solutions using UiPath and Automation Anywhere", 1st Edition, Packt Publishing Ltd., 2020.
- 2. Alok Mani Tripathi, "Robotic Process Automation (RPA) A Practical Guide to Implementing RPA in Your Organization", 1st Edition, BPB Publications, 2020.
- 3. Sandeep Kumar, "Robotic Process Automation: Guide to Building Software Robots", 1st Edition, Apress, 2020.
- 4. Ritesh Modi, "Learning Robotic Process Automation", 1st Edition, Packt Publishing, 2017.

#### Web References

- https://university.automationanywhere.com/
- https://www.youtube.com/c/AutomationAnywhere
- https://www.guru99.com/robotic-process-automation-tutorial.html
- https://www.automationanywhere.com/community
- https://www.freecodecamp.org/news/robotic-process-automation-tutorial/

COs				,	Pro	gram	Outco	mes (P	Os)				Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	3	-	3	-	1	1	2	-	-	-	3	2	roo-
2	3	3	3	-	3	-	1	1	2	-	_	-	3	2	_
3	2	3	3	-	3	-	1	1	2	-	_	_	3	3	
4	2	2	3	-	3	-	1	1	2	-	-	_	3	3	
5	2	2	3	-	3	-	1	1	2	Magni	_		3	3	<del>  </del>

Correlation Level: 1-Low, 2-Medium, 3-High

	Continuous A	ssessment	Marks (C	CAM)	- 1		
Assessment	Performance	in practica	l classes	Model		End Semester Examination	Total
	Conduction of practical	Record work	viva	Practical Examination	Attendance	(ESE) Marks	Marks
Marks	15	5	5	15	10	50	100

Department	Comp	outer Science and Engineering	Prograr	nme: в.	Tech.				
Semester	VI		Course	Categor	d Semestei	Semester Exam Type: LE			
Course Code	U23C	SP605	Periods	/Week	Credit	t Maximum Marks			
			L	T	Р	С	CAM	ESE	TM
Course Name		ATION AND VISUAL EFFECTS RATORY	0	0	2	1	50	50	100
			CSE						
Prerequisite	Basic	s of Animation							
	On co	ompletion of the course, the st	udents will k	e able t	to		(	BT Mapp Highest L	•
	CO1	Understand Layers, Panels, Fran	nes, etc.			К2			
Course	CO2	Utilize motion effects in video clip	S			K3			
Outcomes	CO3	Build some new methods in anim	ations	······································	K3				

К4

К3

Examine Bevel Tool, Knife Tool & Shading Concepts.

#### **List of Exercises**

#### **AFTEREFFECTS**

1. Understanding AFTEREFFECTS

**CO4** 

CO5

- a. Introduction to After Effects
- b. Interface Introduction
- c. Layers, Timeline Panels, Compositions, Links Panel
- d. Animation Principles
- e. Kev frames
- 2. Simple Video Editing & Animation
- 3. Easing & Time Stretching & Imports\Exports\Footage Replacements

Build a 3D Environment.

- 4. Presets & Masking & Text Animation
- 5. Working with Media Encoder
- 6. Vfx & Rendering

#### **PREMIEREPRO**

- 1. Basic start
  - a. Timeline & New Sequence
  - b. Selection & Track Selection tools
  - c. Rolling & Ripple Edit
  - d. Make Slow Motion
  - e. Split\Cut video clip
  - f. Transitions
- 2. Motion Effects control & Animae layers\ Chroma keys
- 3. Masking and Duplication \ Effects & Adjustments Layer
- 4. Colour Splash\ Imports & Exports

#### ANIMATION BLENDER

- 1. Introduction & fundamentals
- 2. Viewport Navigation & Transform & Add\Del
- 3. Modeling Instructions & Creating Meshes
- 4. Extrude & Loop cut
- 5. Bevel Tool & Knife Tool & Shading
- 6. Shading Editor & Texture
- 7. Rigging & parenting
- 8. Creating Landscapes & Environments
- 9. Rain effects & Abstract creation
- 10. 3D Environment

Lecture Periods:0	Tutorial Periods: 0	Practical Periods:30	Total Periods:30

#### Reference Books

- 1Trotter Burt," Mastering Adobe Premiere Pro 2024: Complete Step-by-Step Video Editing Course for Beginners & Veterans ", 1st Edition, Adobe Press, 2024.
- Maxim Jago, "Adobe Premiere Pro Classroom in a Book", 1st Edition, Adobe Press, 2024.
- Oscar Baechler and Xury Greer, "Blender 3D By Example", 2<sup>nd</sup> Edition, Packt Publishing,2020.

  Joe Dockery, Conrad Chavez, "Learn Adobe After Effects CC for Visual Effects and Motion Graphics", 1<sup>st</sup> Edition, Peachpit Press, 2019.
- Chad Perkins, "The After Effects Illusionist: All the Effects in One Complete Guide", 2nd Edition, Routledge, 2017.

# Web References

1. https://www.pdfdrive.com/3d-art-essentials-the-fundamentals-of-3d-modeling-texturing-and-animatione157006123.html
2. https://www.pdfdrive.com/aim-awards-suite-of-games-animation-and-vfx-skills-qualifications-e50802091.html
3. https://www.bloopanimation.com/animation-for-beginners/
4. https://www.rocketstock.com/blog/learn-5-simple-animation-techniques-effects/
5. https://www.premiumbeat.com/blog/text-effect-premiere-pro

COs/POs/PSOs Manning

COs	PO1												Prog Outo	Program Specific Outcomes (PSOs)		
1	2	2	703	104	PU5	P06	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
			3	1	- 1	-	2	-	-	-	-	_	3	2	. 505	
2	_ 2	3	3	2	-	-	2	12	_	100	T Arr			3		
3	2	3	3	2							-	-	3	3	-	
1	2							-	-	-	-	-	3	3	_	
4		3	3	2	-	-	2	-		1 17	-		2			
5	2	3	3	2	_	_	2						3	3	T-1	
	Cornela							-	-		-	-	3	3	-	

Correlation Level: 1-Low, 2-Medium, 3-High

	Continuous A	Assessmen	: Marks (C	CAM)			
Assessment	Performance	in practica	l classes	Model		End Semester	Total
	Conduction of practical	Record work	viva	Practical Examination	Attendance	(ESE) Marks	Marks
Marks	15	5	5	15	10	50	100

Department	Comp	uter Science and Engineering	Prog	ramme:	B. Tec	h.					
Semester	VI					ode: <b>PA</b>	*End Se	emester	Exam Type: -		
Course	U23C	SW602		riods / \		Credit			m Marks		
Code		<i>y</i>	L	Т	Р	С	CAM	ESE	ТМ		
Course Name	MINI F	PROJECT	0	0	2	1	100	-	100		
		-	CSE		I	I			<u> </u>		
Prerequisite	Prog	gramming Languages, Databases	***************************************	***************************************							
	On c	ompletion of the course, the stu				£			BT Mapping Highest Level)		
Course Outcomes	CO1	Identity the problem etatement for the artists of the second for t									
Outcomes	CO2	Choose the proper components	em.	K2							
	CO3										

There shall be a Mini Project, which the student shall pursue as a team consists of maximum 4 students during the third year, fifth semester. The aim of the mini project is that the student has to understand the real time hardware / software applications. The student should gain a thorough knowledge in the problem he/she has selected and in the hardware / software he/she using in the Project. The Mini-project is an application that should be formally initiated and should be developed and also to be implemented by the respective team.

The Mini Project shall be submitted in a report form along with the hardware model / software developed, duly approved by the department internal evaluation committee. It shall be evaluated for 100 marks as Continuous Assessment. The department internal evaluation committee shall consist of faculty coordinator, supervisor of the project and a senior faculty member of the department. There shall be two reviews that will be considered for assessing a Mini Project work with weightage as indicated evaluation Methods.

	<del>-</del>		
Lecture Periods: 0	Tutorial Periods: 0	Practical Periods: 30	Total Periods: 30
			i otal i cilous. 30

# COs/POs/PSOs Mapping

COs		Program Outcomes (POs)  01 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12												Program Specif Outcomes (PSC		
	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PS01	PSO2		
1	3	2	2	2	-	-	-	-	3	3	-	1	1	1	1	
2	3	3	3 .	2	2	2	2	2	3	3	3	1	2	2	2	
3	3	2	2	1	-	2	-	-	3	3	3	1	2	2	2	

# Correlation Level: 1 - Low, 2 - Medium, 3 - High

A		Review 1			Review 2			T-4-1	
Assessment	Novelty	Presentation	Viva	Presentation	Demonstration	Viva	Report	Total Marks	
Marks	<sub>.</sub> 10	20	10	20	20	10	10	100	

2.0.3.82

gradient was per an english over the same and some some and the contract of

organisa pyrkary market y tampa om organisa od dis Karajon tampa aki montanta sampa arteri

Department	Computer Science and Engineering	Progran	nme : <b>B. T</b>	ech				
Semester	VI	Course	Category (	Code: <b>AEC</b>	*End Se	mester	Exam T	ype: -
Course Code	Course Code U23CSC6XX		Periods/	Week	Credit	Maxim	num Mai	ks
	U23C3C6AA	L	Т	Р	С	CAM	ESE	TM
Course Name	Certification Course –VI	0	0	4		100	-	100
	<u></u>	CSE						
Prerequisit	e -							

Students shall choose an International / Reputed organization certification course of 40-50 hours duration specified in the curriculum (It is mandatory to do a minimum of six courses) which will be offered through the Centre of Excellence. These courses have no credit and will not be considered for CGPA calculation.

- (i) Certification Courses are required to be completed to fulfil the degree requirements. All Certification courses are assessed internally for 100 marks.
- (ii) The Course coordinator handling the course will assess the student through attendance and MCQ test, and declare the student as "pass" on satisfactory completion. A letter grade "P" is awarded to declare pass.
- (iii) The marks scored in these courses will not be taken into consideration for the SGPA / CGPA calculations in the grade sheet.

Accesment	Continuous Assess	ment Marks (CAM)	Total Marko
Assessment	Attendance	MCQ Test	Total Marks
Marks	10	90	100

Department	Con	nputer Science and Engine	eering	Pro	gramm	ne: <b>B. Tech.</b>				
Semester	VI			Сс	urse C	ategory: <b>M</b> C	End Ser	neste	r Exan	n
Course Code	U23C	SM606			Period	ls/Week	Credit	Ма	ximum	Marks
				L	Т	Р	С	CA M	ESE	TM
Course Name	GENE	DER EQUALITY		2	0	0	-	100	-	100
D	Ī		CSE							
Prerequisite	-									
		ompletion of the course, th						(	BT Ma Highest	t Level)
Course	CO1	Describe the general identity							K	
Outcomes	CO2	Illustrate the causes and issu							K	2
	CO3	Describe the workplace disc culture.	criminatio	on, n	nedia ii	nfluences on	gender a	ind	K	2
	CO4	Familiarize with international							K	2
	CO5	Illustrate the current challeng and the role of technology.	es in ger	ider e	equality	, including the	glass ceili	ng	K	2
UNIT – I	Intro	duction to Gender Equality	/				Periods	:06		
Gender equality roles and norms	– expl , historic	oring gender identity and expre cal perspectives on gender roles	ession, L s, Analyz	Jnde ing k	rstandir ey miles	ng the social stones in the t	construction	on of nder e	general quality.	CO1
UNIT – II		er Inequality and Its Manif					Periods			<u></u>
awareness, soci	al belief	n Indian society – causes of s, practice and custom – Issues nd health, violence and exploita	s of gend	er dis	scrimina	Illiteracy, pat ation – Child n	riarchal se narriage, c	et up, hild do	lack of omestic	CO2
UNIT – III	Gend	er and Culture					Periods	:06		
Workplace disci Strategies for pr	riminatio omoting	on, Media influences on gende gender equality and cultural ur	er and conderstand	ulture ding.	e, Geno	der and powe	er dynamic	s in s	society.	СОЗ
UNIT – IV	Prom	oting Gender Equality					Periods	:06	L	
Gender Equality under the India Gender Equality	n Const	uman Rights – International frar itution – Policies and initiative ous contexts.	meworks es for ge	and nder	Conver mainst	ntions on Ger reaming – S	nder Equali trategies fo	ity – E or pro	quality moting	CO4
UNIT – V		emporary Challenges and I	Future I	Dire	ctions		Periods:	:06	i	
Current challeng challenging geno future.	jes and der ineq	emerging issues in gender equuality – Exploring possibilities fo	uality – G or transfo	lass orma	ceiling tive cha	– role of tech inge and envi	nology in o sioning a g	contin gende	uing or r-equal	CO5
Lecture Periods	: 30	Tutorial Periods: 0 Pr	ractical F	Perio	ds: 0	Tot	al Periods	: 30		
Text Books				••••••					***************************************	
dynamics, ar 2. "The Second gender inequ 3. "Women and	nd the so Sex" by ality. Gende lity, and	" by Raewyn Connell – This bo ocial construction of gender. y Simone de Beauvoir – A histo r in the Indian Society" by Neer feminist movements in India.	rical and	philo	sophic	al examinatio	n of wome	n's op	pressio	n and
1. Woman in e 2. A social and 3. A social and	arly Indi Cultura Cultura	an societies, New Delhi: Manoh I history, Volume1. Connecticut I history, Volume2. Connecticut dian Feminism: Class, Gender a	:: Oxford: :: Oxford:	Prae Prae	eger. Si eger.	ta Raman (20	009).	on Pre	ess. Iftik	«har,
Veb References	S			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
1. https://www.u		en.org								

- https://www.unwomen.org
   https://ncw.nic.in
   https://en.unesco.org/themes/gender-equality
   https://www.weforum.org/reports
   https://wcd.nic.in

COs		Program Outcomes (POs)											Program Specific Outcomes (PSOs)			
	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	1	-	-	-		-	-	-	-	3	-	1	1		1	
2	1	-	-	-	-	-	-	-	-, "	3	-	1	1	-	1	
3	1	-	-	-	-	-	-	-	-	3	-	1	1	-	1	
4	1	_	-	-	-	-	-	-	-	3		1	1	-	1	
5	1	-	-	-	-	-	-	-	-	3	_	1	1	-	1	

Correlation Level: 1 - Low, 2 - Medium, 3 High

	Continu	ous Assessment	Marks (CAM)	
Assessment	Attendance	MCQ Test	Presentation / Activity / Assignment	Total Marks
Marks	10	30	60	100

# PROFESSIONAL ELECTIVE COURSES

Department	Comp	uter Science and Engineering	Prograi	nme: E	3.Tech				
Semester	VI		Course	Catego	ory: PE	End Se	emester Ex	am Type:	TE
Course Code	U23C5	SE610	Periods	/Week		Credit	Maxim	um Marks	
			L	Т	Р	С	CAM	ESE	TM
Course Name	HASK	ELL PROGRAMMING	3	0	0	3	25	75	100
			CSE		L			L	
Prerequisite	Basic	knowledge in Programming			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
	On co	ompletion of the course, the s	tudents	will b	e able	to		BT Map Highest I	
	CO1	Understand the fundamental concep	ts of functi	onal pro	gramm	ing.		K2	
Course Outcomes	CO2	Utilize the process lists using higher- Haskell.	order fund	tions an	ıd foldin	g techniques	in	K3	
	CO3	Develop the required data types and	construct	the feat	ures of	the Haskell.		K3	
	CO4	Examine the fragmenting and wrapp	ing using I	/lonads				K4	
	CO5	Apply the reasoning and proofs on p	rograms ir	function	nal prog	gramming.		КЗ	
UNIT - I	Introd	uction To Haskell				Periods:0	)9		
Functions. Basic con Decision Making –	oncepts - String -	am – Compilers and Interpreters –. Fur - Basic datatypes - List types - Tuples string concatenation. Type classes: Ec and concatenates them into a single st	types – Po q, Ord, Eni	lymorph um, Sho	nic types w, Rea	s – Overloade d, functor. Pro	d types – O gram: Read	perators – ds multiple	CO1
UNIT - II		nd folding Lists n lists – Lambda Expressions – Using	***************************************	*:		Periods:0			
right – Fold left - I Operations Using F <b>UNIT - III</b> Tuple – Types – m	How to w Folding. Tuple, nap (), wh	- Transforming lists - Filtering lists - Zerite fold functions - Scans - Combinative fold functions - Scans - Combinative functions and Recursive Functions of Filter () functions. Arrays - Cree - Matrix multiplication. Recursive on	atorial funds	otions. F	Program	Periods:0	verage of a	List - List ecovering	CO3
Program: Sorting a	n Array -	Perform Binary Search using recursive				ons.			
UNIT - IV	Monad					Periods:0		NA	[
Maybe, either, IO	. Monad	Monads. Monadic parsing: Parsers I operations: return, >>=, >>, do no	as function tation. Pi	ons - Se ogram:	Buildi	ng a Simple	REPL.	ivionads:	CO4
UNIT - V		output and File concept				Periods:0	. 1. T		r
Input/Output: IO o Composing actions a basic file operatio	recursive	<ul> <li>Actions – Composing actions – Sely – Exception handling – File handling</li> </ul>	equencing g: Reading	actions and writ	s – Pro ing files	moting values s. Program: cre	s to actions eate a file an	: return – id perform	CO5
Lecture Periods	:45	Tutorial Periods: 0	Practic	al Perio	ods: 0	To	otal Period	ds:45	
Text Books									
<ol> <li>Chris Aller</li> </ol>	n, Julie M	loronuki, "Haskell Programming from F	irst Princip	oles", 2 <sup>n</sup>	d Edition	n, Gumroad, 2	017.		
		rogramming in Haskell",2 <sup>nd</sup> Edition, Ca	-						
		king Functionally with Haskell", 1 <sup>st</sup> Ed	ition, Cam	oridge U	Iniversit	y Press, 2015			
Reference Book									
Pragmatic Bo	okshelf, 2					yped Function	nal Program	iming", 1 <sup>st</sup> (	edition,
2. Will Kurt, "Get	t Program	nming with Haskell", 1 <sup>st</sup> Edition, Mannii	ng Publica	tions, 20	)18.				
3. Miran Lipovac	a, "Learn	You a Haskell for Great Good! A Beg	inner's Gu	ide", 1 <sup>st</sup>	Edition,	, No Starch Pr	ess, 2011.		
4. Bryan O'Sulliv	an, Don	Stewart, and John Goerzen, "Real Wo	rld Haskel	", 1 <sup>st</sup> Ed	lition, O	'Reilly Media,	2008.		
5. Simon Thomp	son, "Ha	skell: The Craft of Functional Program	ming", 2 <sup>nd</sup>	Edition,	Addiso	n Wesley, 199	9.		
Web References									

- 1. https://www.tutorialspoint.com/haskell/index.htm
- 2. https://onlinecourses.nptel.ac,in/noc19\_cs80/preview
- 3. https://www.geeksforgeeks.org/what-is-haskell-programming-language/
- 4. https://www.futurelearn.com/courses/functional-programming-haskell
- 5. https://www.cmi.ac.in/~spsuresh/teaching/prgh15/
  - \* TE Theory Exam, LE Lab Exam

COs	Prog	ram C	Outcon	nes (P	Os)									m Spec mes (PS	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	1	2	-	-	-	-	-	-	-	-	-	2	-	-
2	2	2	3	-	-	-	-	-	-	-	-	-	2	-	-
3	2	3	2	-	-	-	-	-	-	-	-	1-1	2	-	-
4	2	3	2	-	-	-	-	-	-	-	-	-	2		-
5	2	3	2	-	-	-	-	-	-	-	-	-	2	_	-

Correlation Level: 1 - Low, 2 - Medium, 3 - High Evaluation Methods

	Continu	uous Ass	essment Marks	(CAM)		End	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	outer Science and Engineering	Progra	mme: <b>B.</b>	Toch					
Semester	VI			Categor			EndC	`		
Course Code	U23C	SE611		s/Week	y. FL	Credi		Mayin		
			L	T	Р		C	Maxim CAM		
Course Name	GAMI	DESIGN AND DEVELOPMENT	3	0	0		3	25	<b>ESE</b> 75	TN
			CSE						/3	100
Prerequisite	Basic	knowledge in Programming								
	On co	mpletion of the course, the stud						(1	BT Mar Highest	
Course	CO1	Understand the Basic concepts of	Mechanics	and Prot	otyping	Technic	aues.	······································	K2	
Outcomes	CO2	Build the Game World.							K3	
Outcomes	CO3	Examine the systems and Feedbac	ck for game							
	CO4	Develop the characters and Game			with uni				K4	
	CO5	Simplify the Iteration in Game Deve	elonment	porateu	with the				К3	
JNIT - I	Core N	Mechanics and Prototyping Tec	hniques						K4	
Designing Core I	Mechanio	cs - Designing Playtests - Collecti	na Feedba	ack - Eva	aluatin	a Protot	tuno De	Period	s:09	
JNIT - II			J		araatii i	9 1 10101	type Pe	enormano	ce.	CO1
	a Stories	ive and Game Worlds						Period	s:09	
Jsing Environme	ent to Co	s - Aligning Story and Gameplay -	Creating	Game W	orlds -	- Chara	cter Ar	chetypes	-	CO2
JNIT - III		ns and Feedback						T B		
System Design P	rinciples	- Types of Feedback Loops - Co	llecting Pla	aver Fee	dhack	Llnda		Periods	s:09	
	9	and Balancing.		ayer ree	uback	- Unde	rstandi	ng Dynar	nic	CO3
NIT - IV	Game \	Worlds and characters with Uni	ity		***************************************			Periods	s:09	
voridbuilding - D Character Evolu	esigning	Memorable Characters - Crafting	Game Er	nvironme	nts - F	Player Ir	nteracti	on with V	Vorld	CO4
NIT - V		ty – Unity Models – Unity used in on and Evaluation	real-time.							•••
								Periods	:09	
efining Gamepla	ay - Evalı	Creating Effective Playtests - Me	thods for A	Analyzin	g Feed	dback -	Techni	ques for		CO5
ecture Periods:	45	Tutorial Periods: 0	Practical	Period	s• ∩		Total	D-: .		
ext Books								Periods	:45	
Tracy Fullerton, "David M. Perry, M. Richard Rouse, "Eference Books  Steve Rabin. "G	Game De lichael J. Game De	llings, "Fundamentals of Game Desig an, "Rules of Play: Game Design Fur sign Workshop: A Playcentric Approa Perry, "Game Design and Developme sign: Theory and Practice", 2 <sup>nd</sup> Edition gramming Gems", 3 <sup>rd</sup> Edition, CRC Pr	ndamentals ach to Crea ent: An Intro on, CRC Pro	s", 3 <sup>rd</sup> Edit ting Innov oduction" ess, 2022	ion, Mit vative G , 3 <sup>rd</sup> Ed	t Pr, 202 Sames'', i	3. 2 <sup>nd</sup> Editi dison-W	Vesley, 202	Press, 2	023.
Michael E. Moor Brian Schrank, "	re, "The A Designing	res for 3D Game Programming and Court of Game Design: A Book of Lenses Games: A Guide to Engineering Expangine Architecture", 3rd Edition, CRC Inc.	omputer Gr s", 2 <sup>nd</sup> Edition	aphics", 3				2023.		

# **Web References**

- 1. https://learn.unity.com/tutorials
- 2. https://dev.epicgames.com/documentation/en-us/unreal-engine/unreal-engine-5-4-documentation
- 3. https://www.gamedev.net/
- 4. https://www.codecademy.com/catalog/subject/game-development
- 5. https://www.geeksforgeeks.org/how-to-get-started-with-game-development/

\* TE – Theory Exam, LE – Lab Exam

# COs/POs/PSOs Mapping

COs	Prog	gram (		mes (F		T = =			·					am Speci mes (PS	
	1	2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO11	PO12		PSO2	PSO3
1	2	2	2	-	_	-	T		-	-					
2	2	2	2	_	-			+	-	-	-	-	2	-	-
3	2	2	2	-		-		-	-	-		-	2	-	-
4	2	3	3	-	-	-	-	-	-	2-	-	-	2	-	
5	2			-		-	-	-	-	-	-	_	2	-	_
<u> </u>	2	3	2	-	-	-	-	-	-	-	-	-	2		

# Correlation Level: 1 - Low, 2 - Medium, 3 - High Evaluation Methods

A		uous Ass	essment Marks	(CAM)		End	Total
Assessment  Marks	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Marks
IVIALKS	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	uter Science and Engineering	Program	me: <b>B.</b>	Tech				
Semester	VI		Course (				End Seme	ster Exam Ty	ne: <b>T</b> F
Course Code	U23C	SE612	Periods/			Credit		imum Marks	***************************************
			L	Т	Р	С	CAN		TM
Course Name	NOSO	L DATABASE	3	0	0	3	25	75	100
			CSE						
Prerequisite	Basic	Knowledge in Database							
			lents will be	e able t	· O			ВТ Мар	ning
		,						(Highest	
	CO1	Understand the detailed Architectu	ire, Database	proper	ties and	Storage		K2	
			Dool time Ar	مناممانم					***************************************
Course			C. Webschmann Co. Co. Co. Co. Co. Co. Co. Co. Co. Co.		115.			K3	
Outcomes		<b>.</b>		•				K3	
				o of Ind	ovoo in	ManaaDD		K4	
UNIT - I			ODB & USay	e or ma	exes in	T		K3	
			V gonorotion	Manasi	T	Periods	:09		
and BASE for relia	able datab	ase transactions, speeding Performa	ance by strat	Managi edic use	ng rrar e of RAI	isactions a M. SSD. a	and Data Inte nd disk- achi	egrity, ACID	CO1
norizontal scalabili	ty with Da	tabase sharing, Brewers CAP theore	em.			vi, 00D, u	na alok-aom	eving	
UNIT - II						Periods	:09		
NoSQL Data mod	el: Aggre	gate Models- Document Data Mode	el- Key-Value	Data N	/lodel C	olumnar [	Data Model,	Graph Based	CO2
data to the query,	hash ring	is to distribute the data on clusters.	nandle big replication to	data scale r	problem eads F	is, Movin Database (	g Queries distributed au	to data, not	
Data nodes.	.,					odiabaoc (	alottibuteu qt	iches to	
UNIT - III						Periods	:09	1994	
Essential features	of key va	lue Databases, Properties of keys, C	haracteristic	s of Valu	ues, Ke	y-Value Da	atabase Data	Modeling	CO3
and Deleting Data	-quervino	e. Document, Collection, Naming, CR Lindexing, Replication, Sharing	(UD operatio	n, Creat	ting Red	cords, Acc	essing Data,	Updating	
UNIT - IV	.,					D!I-			
			torage Archit	ecture	Docume	Periods	nternals Line		T
Key/Value Stores i	n Memca	ched and Redis, Eventually Consiste	ent Non-Relat	tional D	atabase	es.	riterriais, orit	erstanding	CO4
						D I			
UNIT - V	Indexi	ng and Ordering Data Sets					:09		
UNIT - V Indexing and Orde		and the state of t	Datahase Ind	ev Inde	vina an	Periods:	a in Monaodi	Croating	
Indexing and Orde	ring Data	Sets: Essential Concepts Behind a [	Database Ind db, Indexing	ex, Inde in Apac	exing an the Cas	d Orderin	g in Mongodl	o, Creating	CO5
Indexing and Orde	ring Data in Mongo	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couch	db, Indexing	in Apac	he Cas	nd Ordering sandra.			CO5
Indexing and Orde and Using Indexes  Lecture Periods	ring Data in Mongo	Sets: Essential Concepts Behind a [	Database Ind db, Indexing Practical	in Apac	he Cas	nd Ordering sandra.	g in Mongodl  Total Peri		CO5
Indexing and Orde and Using Indexes Lecture Periods Text Books	ring Data in Mongo	Sets: Essential Concepts Behind a Eodb, Indexing and Ordering in Couch  Tutorial Periods: 0	db, Indexing  Practical	Period	he Cas	nd Ordering sandra.	Total Peri	ods:45	
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen	ring Data in Mongo :45 and Michaelt, 2nd	Sets: Essential Concepts Behind a Eodb, Indexing and Ordering in Couch  Tutorial Periods: 0  nael Kaufmann, "SQL and NoSQL Da Edition, Springer, 2023.	Practical atabases: Mo	Period	he Cas ds: 0 Langua	nd Ordering sandra.	Total Peri	ods:45	
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S	ring Data in Mongo :45 and Mich nent", 2 <sup>nd</sup> fullivan, "N	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couch Tutorial Periods: 0  Tatorial Periods: 0	Practical atabases: Mo Addison-We	Period deling, lasley, 20	he Case  Is: 0  Langua  15.	d Ordering sandra.	Total Peri	ods:45 itectures for B	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F	ring Data in Mongo :45 and Mich nent", 2 <sup>nd</sup> fullivan, "N	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couch Tutorial Periods: 0  Tatorial Periods: 0  Tatorial Periods: 0  Tatorial Periods: 1  Tatorial Periods: 0  Tatorial Periods: 0  Tatorial Periods: 1  T	Practical atabases: Mo Addison-We	Period deling, lasley, 20	he Case  Is: 0  Langua  15.	d Ordering sandra.	Total Peri	ods:45 itectures for B	ig
Indexing and Orde and Using Indexes  Lecture Periods Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D.	ring Data in Mongo ::45 rand Mich nent", 2 <sup>nd</sup> fullivan, "N Peter Bon Edition, No Manning	Sets: Essential Concepts Behind a Eodb, Indexing and Ordering in Couche  Tutorial Periods: 0  nael Kaufmann, "SQL and NoSQL Da Edition, Springer, 2023. NoSQL for Mere Mortals", 1st Edition, cz and Stavros Harizopoulas, "The Eow Publishers, 2013. Prabhakar Raghavan, Hinrich Schtz	Practical atabases: Mo Addison-We Design and In	Period deling, sley, 20 nplemer	ds: 0  Langua  15.  ntation of	d Ordering sandra. ges, Secu	Total Perion of the contract o	ods:45 itectures for B inted Database	ig
Indexing and Orde and Using Indexes  Lecture Periods Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge Uni	ring Data in Mongo ::45 and Mich nent", 2 <sup>nd</sup> fullivan, "N Peter Bon Edition, No Manning iversity Po	Sets: Essential Concepts Behind a Eodb, Indexing and Ordering in Couche  Tutorial Periods: 0  nael Kaufmann, "SQL and NoSQL Da Edition, Springer, 2023. NoSQL for Mere Mortals", 1st Edition, cz and Stavros Harizopoulas, "The Eow Publishers, 2013. Prabhakar Raghavan, Hinrich Schtz	Practical atabases: Mo Addison-We Design and In	Period deling, sley, 20 nplemer	ds: 0  Langua  15.  ntation of	d Ordering sandra. ges, Secu	Total Perion of the contract o	ods:45 itectures for B inted Database	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge Uni  Reference Book	ring Data in Mongo :45 and Michaent", 2 <sup>nd</sup> cullivan, "Neter Bone Edition, No Manning iversity Pos	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche Tutorial Periods: 0  Tutorial Periods: 0  Tale Kaufmann, "SQL and NoSQL Datedition, Springer, 2023.  NoSQL for Mere Mortals", 1st Edition, cz and Stavros Harizopoulas, "The End Publishers, 2013.  Prabhakar Raghavan, Hinrich Schtzerss, 2008.	db, Indexing Practical atabases: Mo Addison-We Design and In	Period deling, sley, 20 nplemer uction to	he Cass  Is: 0  Langua  115.  Intation of the control of the cass  Information of the cass of the cass of the cass of the case of the cass of the cass of the cass of the cass of the cass of the cass of the cass of the cass of the cass of the cass of the cass of the cass of the case	ges, Secu of Modern	Total Perinty and Arch Column-Orie	ods:45 itectures for B inted Database ition,	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge Uni  Reference Book 1. Sadalage P & I Wiley Publicati	ring Data in Mongo :45  and Michaent", 2 <sup>nd</sup> fullivan, "Neter Bone Edition, Note Manning iversity Property s Fowler, "Nons, 2019	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche Tutorial Periods: 0  Tutorial Periods: 0  Tutorial Periods: 0  Tutorial Periods: 1  Tutorial Periods: 0	db, Indexing Practical atabases: Mo Addison-We Design and In ze, "An introd Emerging W	Period deling, sley, 20 nplemer uction to	he Cass  Is: 0  Langua  115.  Intation of one of the control of th	ges, Secu of Modern nation Reti	Total Perinty and Arch Column-Orie	ods:45 itectures for B inted Database ition,	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge Uni  Reference Book 1. Sadalage P & I Wiley Publicati 2. Andreas Meier	ring Data in Mongo :45  and Michael cultivan, "Neter Bone dition, Note Manning iversity Properties of the content of the conte	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche Tutorial Periods: 0  Tutorial Periods: 0  Tale Kaufmann, "SQL and NoSQL Datedition, Springer, 2023.  NoSQL for Mere Mortals", 1st Edition, cz and Stavros Harizopoulas, "The End Date Publishers, 2013.  Prabhakar Raghavan, Hinrich Schtzerss, 2008.  NoSQL Distilled: A Brief Guide to the Kaufmann, "SQL & Nosql Databases	db, Indexing  Practical  Atabases: Mo  Addison-We Design and In  Ze, "An introd  Emerging W  5",1st Edition.	Period deling, sley, 20 nplemer uction to	he Case  Is: 0  Langua  115.  Intation of the control of the contr	ges, Secu of Modern nation Reti	Total Perinity and Arch Column-Orienieval", 1st Ed	itectures for B inted Database ition,	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge Uni  Reference Book 1. Sadalage P & I Wiley Publicati 2. Andreas Meier 3. Perkins, Eric R	ring Data in Mongo :45  and Michael edition, No Manning iversity Pi s Fowler, "Nons,2019 , Michael edmond,	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche and Indexing and Ordering in Couche and Indexing and Ordering in Couche and Indexing and Ordering in Couche and Indexing and Indexing Index Inde	db, Indexing  Practical  Atabases: Mo  Addison-We Design and In  Ze, "An introd  Emerging W  5",1st Edition.	Period deling, sley, 20 nplemer uction to	he Case  Is: 0  Langua  115.  Intation of the control of the contr	ges, Secu of Modern nation Reti	Total Perinity and Arch Column-Orienieval", 1st Ed	itectures for B inted Database ition,	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge Uni  Reference Book 1. Sadalage P & I Wiley Publicati 2. Andreas Meier 3. Perkins, Eric R NoSQL Movem 4. Guy Harrison, "	ring Data in Mongo :45  and Michael cullivan, "Neter Bon Edition, No Manning iversity Po s Fowler, "Nons, 2019 , Michael edmond, nent", 2nd 'Next Ger	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche and Indexing and Ordering in Couche and Indexing and Ordering in Couche and Indexing and Ordering in Couche and Indexing and Indexing Index Inde	db, Indexing Practical Atabases: Mo Addison-We Design and In Ze, "An introd Emerging W 5",1st Edition, Even Weeks: Ata", 1st Edition, Atabases: Mo	Period deling, sley, 20 nplemer uction to	Langua  15.  ntation of one of the Moodest Community of the Moodest Com	ges, Secu of Modern nation Reti Persisten 2019. dern Datab	Total Perinity and Arch Column-Orienieval", 1st Ed	itectures for B inted Database ition,	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge Unit Reference Book 1. Sadalage P & I Wiley Publicati 2. Andreas Meier 3. Perkins, Eric R NoSQL Movem 4. Guy Harrison, '65. Elmasri and Na	ring Data in Mongo :45  and Michael cullivan, "Neter Bon Edition, No Manning iversity Po s Fowler, "Nons, 2019 , Michael edmond, nent", 2nd 'Next Ger	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche and Indexing and Ordering in Couche and Indexing and Ordering in Couche and Indexing and Ordering in Couche and Indexing and Indexing Index Inde	db, Indexing Practical Atabases: Mo Addison-We Design and In Ze, "An introd Emerging W 5",1st Edition, Even Weeks: Ata", 1st Edition, Atabases: Mo	Period deling, sley, 20 nplemer uction to	Langua  15.  ntation of one of the Moodest Community of the Moodest Com	ges, Secu of Modern nation Reti Persisten 2019. dern Datab	Total Perinity and Arch Column-Orienieval", 1st Ed	itectures for B inted Database ition,	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge University Cambridge	ring Data in Mongo in Mongo in Mongo it 45  rand Michael, "Nons, 2019, Michael edmond, nent", 2nd 'Next Geravathe, "Formal in Manning in the second in the s	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche odb, Index	db, Indexing Practical atabases: Mo Addison-We Design and In Ze, "An introd Emerging W S",1st Edition, Even Weeks: ata", 1st Edition, F	Period deling, sley, 20 nplemer uction to Period of F Repro I A Guide on, Apre Pearson	Langua  15.  ntation of one of the Moodest Community of the Moodest Com	ges, Secu of Modern nation Reti Persisten 2019. dern Datab	Total Perinity and Arch Column-Orienieval", 1st Ed	itectures for B inted Database ition,	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge Unit Reference Book 1. Sadalage P & I Wiley Publication 2. Andreas Meier 3. Perkins, Eric R NoSQL Movem 4. Guy Harrison, 15. Elmasri and Nata Web References 1. https://www.cours	ring Data in Mongo in	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche odb, Index	db, Indexing Practical atabases: Mo Addison-We Design and In Ze, "An introd Emerging W S",1st Edition, Even Weeks: ata", 1st Edition, F	Period deling, sley, 20 nplemer uction to Period of F Repro I A Guide on, Apre Pearson	Langua  15.  ntation of one of the Moodest Community of the Moodest Com	ges, Secu of Modern nation Reti Persisten 2019. dern Datab	Total Perinity and Arch Column-Orienieval", 1st Ed	itectures for B inted Database ition,	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge University Cambridge	ame NOSQL DATABASE  On completion of the course, the CO1 Understand the detailed Arch Requirements.  CO2 Identify right Database mode CO3 Build the connectivity with NO CO4 Examine the Non-Relational CO5 Make use of the Indexing on Introduction to NoSQL  revolutions: First generation, second generation for reliable database transactions, speeding Percalability with Database sharing, Brewers CAP NoSQL Data Architecture Patter that model: Aggregate Models-Document Data el Graph Data Model, NoSQL system way query, hash rings to distribute the data on clusts.  Interacting with NoSQL Data Stoperaction of the properties of key-Value Database. Document, Collection, Naming Data -querying, indexing, Replication, Sharing NoSQL Storage Architecture with Column-Oriented Databases, Hbase Distribustores in Memcached and Redis, Eventually Column-Oriented Databases, Hbase Distribustores in Memcached and Redis, Eventually Column-Oriented Databases, Hbase Distribustores in Memcached and Redis, Eventually Column-Oriented Databases, Hbase Distribustores in Memcached and Redis, Eventually Column-Oriented Databases, Hbase Distribustores in Memcached and Redis, Eventually Column-Oriented Databases, Hbase Distribustores in Memcached and Redis, Eventually Column-Oriented Databases, Hbase Distribustores in Memcached and Redis, Eventually Column-Oriented Databases, Hbase Distribustores in Memcached and Redis, Eventually Column-Oriented Databases, Hbase Distribustores, 2013.  Indexing and Ordering Data Sets: Essential Concepts Behindexes in Mongodb, Indexing and Ordering in Column-Oriented Databases, Hosquand Nosquand Peter Boncz and Stavros Harizopoulas, 1st Edition, Now Publishers, 2013.  Indexing and Ordering Column-Oriented Database: Nosquand Rosquand	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche odb, Index	db, Indexing Practical atabases: Mo Addison-We Design and In Ze, "An introd Emerging W S",1st Edition, Even Weeks: ata", 1st Edition, F	Period deling, sley, 20 nplemer uction to Period of F Repro I A Guide on, Apre Pearson	Langua  15.  ntation of one of the Moodest Community of the Moodest Com	ges, Secu of Modern nation Reti Persisten 2019. dern Datab	Total Perinity and Arch Column-Orienieval", 1st Ed	itectures for B inted Database ition,	ig
Indexing and Orde and Using Indexes  Lecture Periods  Text Books  1. Andreas Meier Data Managen 2. Dan Sullivan S 3. Daniel Abadi, F Systems", 1st E 4. Christopher D. Cambridge University Cambridge	ring Data in Mongo :45  and Michael dillivan, "No eter Bone dition, No Manning iversity Pr s Fowler, "No ons, 2019 , Michael edmond, hent", 2nd 'Next Ger avathe, "F sera.org/li asforgeeks point.com com/nosc	Sets: Essential Concepts Behind a Endb, Indexing and Ordering in Couche odb, Index	db, Indexing Practical atabases: Mo Addison-We Design and In Ze, "An introd Emerging W S",1st Edition, Even Weeks: ata", 1st Edition, F	Period deling, sley, 20 nplemer uction to Period of F Repro I A Guide on, Apre Pearson	Langua  15.  ntation of one of the Moodest Community of the Moodest Com	ges, Secu of Modern nation Reti Persisten 2019. dern Datab	Total Perinity and Arch Column-Orienieval", 1st Ed	itectures for B inted Database ition,	ig

COs	Prog		utcon	nes (P	Os)									m Speci mes (PS)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	2	2	-	-	-	=	-	-	-	-	-	2	-	-
2	2	2	3	-	-	-	-	-	-	-		-	2	-	
3	2	3	3	-	-	3-2	-	-	-	-	_	-	2	-	-
4	2	2	2	-	-	3-7	-	-	-		-	-	2	-	-
5	2	2	2	-	_		_	-	-	=	-	_	2	-	-

# Correlation Level: 1 - Low, 2 - Medium, 3 – High Evaluation Methods

	Continu	uous Ass	essment Marks	(CAM)	-	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

eriods/We eriods/We T 0 will be ab s of IoT Arc alytics tems	P 0	Credit C 3	······································	ter Exam Ty aximum Ma ESE 75  BT Mapp (Highest L K2 K3	rks TM 100  bing evel)
T 0 will be abs of IoT Arcalytics	P 0	C 3	CAM	BT Mapp (Highest L K2	TM 100 bing evel)
will be ab	0 ole to	3		BT Mapp (Highest L K2 K3	100 bing evel)
will be ab	ole to		25	BT Mapp (Highest L K2 K3	oing evel)
s of IoT Arc alytics		e and layer		(Highest L K2 K3	evel)
s of IoT Arc alytics		e and layer		(Highest L K2 K3	evel)
s of IoT Arc alytics		e and layer		(Highest L K2 K3	evel)
alytics	chitectur	e and layer		К3	
tems					
				K4	
				K2	
				K3	
		Periods			,
					CO1
				21VI.	
					CO2
	nagemer			3.	COZ
				:,	
					000
.stabiisnme	ent – A	cess contro	oi – Secure	: wessage	CO3
		Doriodo	.00		
U-T 0:	- II-T			isstins	
			- IIOT COM	nunication-	CO4
urvey Rout	ung Prot		-00		<u> </u>
					CO5
Juon-Case	Studies	with archite	coluiai allai	yolo UI IUI	300
tical Peri	iods: 0	1	Total Per	iods:45	
1 C	Internet in d Analytic ness proces wledge Mar olutions lysis —use Establishme -IIoT Sensic Survey Rou nt- Logistics ction-Case	Internet in IoT- IoT d Analytics ness processes – In wledge Managemen olutions lysis –use case a Establishment – Ac elloT Sensing - IIoT Survey Routing Prot nt- Logistics-Agricult	Internet in IoT- IoT frameworks  d Analytics Periods  less processes – Integration are wiedge Management Reference Polutions Periods  lysis –use case and misuse Establishment – Access control  Periods  United Services Periods  Integration are wiedge Management Reference Periods  Integration are w	Internet in IoT- IoT frameworks- IoT and M2  d Analytics Periods:09  These processes – Integration and Enterprise whedge Management Reference Architecture Periods:09  Typis – use case and misuse cases – Iot Establishment – Access control – Secure Periods:09  Formula	Internet in IoT- IoT frameworks- IoT and M2M.  d Analytics Periods:09  The sess processes – Integration and Enterprise Systems - Wiedge Management Reference Architecture.  Dlutions Periods:09  Tysis – use case and misuse cases – IoT security Establishment – Access control – Secure Message  Periods:09  Tho T Sensing - IIoT Processing - IIoT Communication-Burvey Routing Protocols.  Periods:09  The Logistics-Agriculture- Health and Lifestyle- Industrial ction-Case studies with architectural analysis of IoT

- 1. D. Hanes, G. Salgueiro, P. Grossetete, R. Barton, J. Henry, "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", 1st Edition, Pearson India Pvt. Ltd., 2018.
- 2. Raj Kamal, "INTERNET OF THINGS (IOT): Architecture and Design Principles", 2<sup>nd</sup> Edition, McGraw Hill Education (India) Private Limited.2017.
- 3. Alasdair Gilchrist," Industry 4.0: The Industrial Internet of Things", 1st Edition, Apress, 2017.
- 4. Arshdeep Bahga, Vijay Madisetti Universities, "Internet of Things-A Hands-on Approach", 1st Edition, Orient Blackswan Private Ltd., 2015.
- 5. HakimaChaouchi, "The Internet of Things Connecting Objects to the Web", 1st Edition, Wiley Publications, 2010.

#### Reference Books

- 1. Y. Kanetkar, S. Korde, "21 Internet of Things (IOT) Experiments: Learn IoT, the programmer's way", 1st Edition, BPB Publications, 2018.
- 2. Sabina Jeschke, Christian Brecher, Houbing Song, Danda B.Rawat, "Industrial Internet of Things: Cyber Manufacturing Systems", 1st Edition, Springer, 2017.
- 3. Peter Waher, "Learning Internet of Things", 1st Edition, Packt Publishing, 2015.
- 4. Giacomo Veneri, Antonio Capasso, "Hands-on Industrial Internet of Things: Create a powerful Industrial IoT", 1st Edition, Packt, 2018.
- 5. Adrian McEwen, "Designing the Internet of Things", 1st Edition, Wiley, 2013.

## Web References

- 1. https://www.geeksforgeeks.org/introduction-to-internet-of-things-iot-set-1/
- 2. https://www.tutorialspoint.com/internet\_of\_things/index.htm
- 3. https://www.javatpoint.com/iot-internet-of-things
- 4. https://www.digi.com/blog/category/iot-trends
- 5. https://archive.nptel.ac.in/courses/106/105/106105166/
  - \* TE Theory Exam, LE Lab Exam

COs	0.1			1 5	Prog	ram C	Outcor	nes (F	POs)					ram Spo omes (F	
003	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	2	-	-	-	-	-	-	-	-			2		
2	2	2	3	-	-	-	-	-	-	-	-	-	2	-	-
3	2	2	3	2	-	-	-	-	-	-	-	-	2		-
4	2	2	_	-	-	_	-	-	-	-	-	-	2		-
5	2	3	3	-	-	-	-	-	-	-	-	-	2	1 <b>-</b> 1	-

# Correlation Level: 1 - Low, 2 - Medium, 3 – High Evaluation Methods

		Conti	nuous Assessr	nent Marks (CAI	VI)	End	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Semester	VI	uter Science and Engineering	Pr	ogrami	me: <b>B.T</b>	ech				
Course Code	U23CS	SEC14	Co	urse C	ategory	/· PE	Endo			
3 34.00 0000	02303	DE614		Period	ls/Week	. FE	Cradit	mester I	Exam	Туре: <b>Т</b>
Course Name	SEDVI	TR SIDE COR	L	Т	F		Credit			n Mark
	OLKVI	R-SIDE SCRIPTING LANGUAGES	3	0			<b>C</b> 3	CAM	ESI	
Prerequisite	A has	ic understand						25	75	10
-		ic understanding of Client-Server Archi	tectur	e & wh	nat a we	b sen	/er is			
	On co	empletion of the course, the students	s will	ho ahl	o 40		/O1 13.		DT	Γ N /
	CO1	Understand the basics of	- vv III	DE ADI	610				(Hia	Mapp hest Le
Course	CO2	Understand the basics of scripting langua	ages.						(1119	K2
Outcomes	CO3	Experiment about scripting with respective	e to re	active v	web Pag					
	CO4	The basic full clionality lising Pea	rl corin	tim -				***************************************		K3
		reprivase the basic functionality using Ru	hy cor	intina						K3
LIMIT .	CO5	interence the in-depth knowledge of pre-		na feati	iroo of A					K2
UNIT - I	Introd	uction to scripts and scripting langu	2000	ig leatu	ires of A	ngular	JS			K4
Controduction to Sc					•		Period	s:09	***************************************	
Scripting. JavaSc	ript: Var	d Scripting Languages – Scripts and iables, Data Types, Operators, Cons., Accessing objects, Object Methods.	riogra	ams, L	Jses fo	r Scrip	oting Lai	nguages,	Web	
Objects- Fredefine	ea object	s, Accessing objects, Object Matheda		ai state	ements,	Loop	os, Arra	s, Func	tions.	CC
	JavaSc	rint for reactive								
JavaScript prograr	HITHING O	reactive wob need					Periods	s:09		
Form events, wind	ow event	f reactive web pages elements f reactive web pages elements: JavaS s, Event handlers, Frames, Form object	cript	Events	- Mous	e eve	nts, Kev	board ev	/ents	T
UNIT - III	***************************************	objective form objective for form objective form objective form objective form objective for form objective form objective form objective form objective for form objective form objective form objective form objective for form objective for form objective form objective form objective form objective for form objective form objective form objective form objective for form objective form objective form objective form objective for form objective form objective form objective form objective for form objective form objective form objective form objective for form objective form objective form objective form objective for form objective form objective form objective form objective for form objective form objective for form objective for form objective form objective form objective form objective form objective form objective form objective form objective form objective for form objective for form objective for form objective for form objective form objective for form objective for form objective for form objective for form objective for form objective for form	t, Jav	aScrip	t Form	Valida	tion		cino,	CO
Eunation - Du	oles, Sca	lars, Operators, Conditional statements	: 100	nc ^		·	Periods	:09		
r unctions, Pattern	matching	lars, Operators, Conditional statements and regular expression operators.	, LOO	ps, A11	ays, St	rings,	Hashes,	Lists, Bu	uilt-in	
• • • • • • • • • • • • • • • • • • • •	RUBY									COS
Data types Variob	NOD I						Dorioda			
Hashes, File I/O	Ruby For	rators, Conditional statements, Loops, m handling.	Metho	ods BI	ocke M	اللماما	- ^	09		
	tuby I-Of	m nandling.		очо, Б	ocks, iv	lodule	s, Arrays	s, Strings	,	
	_									
UNIT - V	Angular.	JS								CO4
AngularJS Develop	Angular ment Env	vironment Even				F	Periods:	09	<u>.</u>	CO4
AngularJS Develop	ment Fny	vironment Even	ngula	ırJS Di	rectives	F s, Data	Periods:	09 1 Angula	r IS	CO4
AngularJS Develop	ment Fny	vironment Even	ngula	ırJS Di ər, Ang	rectives	Foone	Periods: Binding	09 I, Angula	rJS	
AngularJS Developr Model Modes, One AngularJS Forms.	ment Env Way Bin	rironment, Expressions in AngularJS, A ding, Two Way Binding, AngularJS Co	ngula	ırJS Di ər, Anç	rectives	Foope	Periods: Binding B, Angul	<b>09</b> I, Angula arJS Filte	rJS ers,	CO4
AngularJS Developr Model Modes, One AngularJS Forms. ecture Periods:45	ment Env Way Bin	vironment, Expressions in AngularJS, Adding, Two Way Binding, AngularJS Co	, itti Olli	er, Ang	gularJS	Scope	e, Angul	arJS Filte	ers,	
AngularJS Developr Model Modes, One AngularJS Forms. ecture Periods:45 ext Books	ment Env Way Bin	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Co	ractio	al Per	jularJS iods: 0	Scope	e, Angul	arJS Filte	ers,	
AngularJS Developr Model Modes, One AngularJS Forms. ecture Periods:45 ext Books	ment Env Way Bin	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Co	ractio	al Per	jularJS iods: 0	Scope	e, Angul	arJS Filte	ers,	CO5
AngularJS Developr Model Modes, One AngularJS Forms. ecture Periods:45 ext Books David Flanagan, " O'Reilly Publication	Way Bin	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Co  Tutorial Periods: 0  Pt: The Definitive Guide: Master the Wa	ractio	al Per	iods: 0	Scope	Total	arJS Filte	ers,	CO5
AngularJS Developr Model Modes, One AngularJS Forms. ecture Periods:45 ext Books David Flanagan, " O'Reilly Publication	Way Bin	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Co  Tutorial Periods: 0  Pt: The Definitive Guide: Master the Wa	ractio	al Per	iods: 0	Scope	Total	arJS Filte	ers,	CO5
AngularJS Developr Model Modes, One IngularJS Forms. ecture Periods:45 ext Books David Flanagan, " O'Reilly Publicatio O'Reilly, "Learnin Edition, O'Reilly P	JavaScri g PHP, Mublication	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Co  Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Wol.  MySQL, JavaScript, CSS & HTML5: A Sec. 2014	ractions orld's Step-b	er, Ang  cal Per  Most-U  y-Step	riods: 0  Jsed Pr	Scope ogram	Total Iming La	Periods  nguage",	:45	CO5
AngularJS Developroduced Modes, One angularJS Forms.  acture Periods:45  ext Books  David Flanagan, "O'Reilly Publication O'Reilly Publication O'Reilly Publication O'Reilly Publication, O'Reilly Pub	JavaScrions, 2020 Brian D	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Co  Tutorial Periods: 0  Pt: The Definitive Guide: Master the William Community (CSS & HTML5: ASM C	raction orld's Step-b	Most-Uy-Step	gularJS riods: 0 Jsed Pr	Scope ogram to Cre	Total Iming La	Periods  nguage",	:45	CO5
AngularJS Developroduced Modes, One angularJS Forms.  acture Periods:45  ext Books  David Flanagan, "O'Reilly Publication O'Reilly Publication O'Reilly Publication O'Reilly Publication, O'Reilly Pub	JavaScrions, 2020 Brian D	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Co  Tutorial Periods: 0  Pt: The Definitive Guide: Master the William Community (CSS & HTML5: ASM C	raction orld's Step-b	Most-Uy-Step	gularJS riods: 0 Jsed Pr	Scope ogram to Cre	Total Iming La	Periods  nguage",	:45	CO5
AngularJS Developrodel Modes, One AngularJS Forms.  acture Periods:45 ext Books  David Flanagan, "O'Reilly Publication O'Reilly, "Learning Edition, O'Reilly Publication, O'Reil	JavaScrions, 2020 g PHP, Mublication Brian De World of	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Color Tutorial Periods: 0 P  pt: The Definitive Guide: Master the World States of Series, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will	raction or raction or	Most-Ly-Step Perl", 4	Jsed Pr Guide  4th Edit	ogram to Cre ion, O	Total Iming La eating Dy	Periods  nguage", namic W edia,201	ers, :45 7 <sup>th</sup> Ed /ebsite	CO5  dition, es", 3rd
AngularJS Developrodel Modes, One AngularJS Forms.  acture Periods:45 ext Books  David Flanagan, "O'Reilly Publication O'Reilly, "Learning Edition, O'Reilly Publication, O'Reil	JavaScrions, 2020 g PHP, Mublication Brian De World of	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Color Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Wold MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Hollmann, "Residence of Scripting Languages", 1st Edition, Nature of Scripting Languages, 1st Edition, 1st E	orld's Step-b ming ey Pu	Most-L y-Step Perl", 4	Jsed Pr Guide 4th Edit	ogram to Cre ion, O	Total Total Iming La Pating Dy	Periods  Periods  nguage",  namic W  edia,201	ers,  :45  7 <sup>th</sup> Ec	CO5  dition, es", 3rd
AngularJS Developrodel Modes, One angularJS Forms.  acture Periods:45  ext Books  David Flanagan, "O'Reilly Publication O'Reilly Publication O'Reilly Publication O'Reilly Publication, O'Reilly Publi	JavaScrions, 2020 g PHP, Mublication Brian De World of	rironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Color Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Way MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Interest of Master the Way Mas	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition,  gs", 3rd
AngularJS Developrodel Modes, One angularJS Forms.  acture Periods:45  ext Books  David Flanagan, "O'Reilly Publication O'Reilly Publication O'Reilly Publication O'Reilly Publication, O'Reilly Publi	JavaScrions, 2020 g PHP, Mublication Brian De World of	rironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Color Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Way MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Interest of Master the Way Mas	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition,  gs", 3rd
AngularJS Developrodel Modes, One angularJS Forms.  acture Periods:45  ext Books  David Flanagan, "O'Reilly Publication O'Reilly Publication O'Reilly Publication O'Reilly Publication, O'Reilly Publi	JavaScrions, 2020 g PHP, Mublication Brian De World of	rironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Color Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Way MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Interest of Master the Way Mas	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition, as", 3rd
AngularJS Developrodel Modes, One angularJS Forms.  ecture Periods:45 ext Books  David Flanagan, "O'Reilly Publication O'Reilly, "Learnin Edition, O'Reilly Publication, O'Reill	JavaScrions, 2020 g PHP, Mublication Brian De World of	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Color Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Wold MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Hollmann, "Residence of Scripting Languages", 1st Edition, Nature of Scripting Languages, 1st Edition, 1st E	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition, as", 3rd
AngularJS Developromodel Modes, One angularJS Forms.  ecture Periods:45 ext Books  David Flanagan, "O'Reilly Publication O'Reilly, "Learning Edition, O'Reilly Pour Christiansen, David Barron, "The Ference Books  Russ Ferguson, One David Flanagan and J. Lee, B. Ware, "Pearson Educations of Modes and Pearson Educations of Modes and Pearson Educations of Modes and Modes and Pearson Educations of Modes and Pearson	JavaScrions, 2020 g PHP, Mublication Brian De World of Christian and Yukir OpenSon	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Colored Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Wol.  MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Indicate Web Development with LAMP using the street of the sense.	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition, as", 3rd
AngularJS Developromodel Modes, One angularJS Forms.  ecture Periods:45 ext Books  David Flanagan, "O'Reilly Publication O'Reilly, "Learning Edition, O'Reilly Portion Christiansen, David Barron, "The Ference Books  Russ Ferguson, Oravid Flanagan and J. Lee, B. Ware, "Pearson Education be References  https://www.ruby-learner.	JavaScrions, 2020 g PHP, Mublication Brian De World of	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Colored Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Wol.  MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Indicate Web Development with LAMP using the sen/	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition,  gs", 3rd
AngularJS Developrodel Modes, One angularJS Forms.  ecture Periods:45 ext Books  David Flanagan, "O'Reilly Publication, O'Reilly, "Learning Edition, O'Reilly Publication, O'Rei	JavaScrions, 2020 g PHP, Mublication Brian De World of Christian Ind Yukih OpenSon, 2003.	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Colored Tutorial Periods: 0 P  Pt: The Definitive Guide: Master the Wol.  MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Indire Matsumoto, "The Ruby Programming Languages" with LAMP using the Core of t	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition,  ard  3rd
AngularJS Developrodel Modes, One angularJS Forms.  acture Periods:45 ext Books  David Flanagan, "O'Reilly Publication O'Reilly, "Learning Edition, O'Reilly Publication, O'Reil	JavaScrions, 2020 Brian De World of Christian Ind Yukir OpenSon, 2003.  ang.org/oforgeeksont.com	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Colored Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Wol.  MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Italian Matsumoto, "The Ruby Programming Urce Web Development with LAMP using the core with the co	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition,  ard  3rd
AngularJS Developromodel Modes, One angularJS Forms.  ecture Periods:45 ext Books  David Flanagan, "O'Reilly Publication O'Reilly, "Learning Edition, O'Reilly Publication, O'Re	JavaScrions, 2020 g PHP, Mublication Brian De World of Christian and Yukir OpenSon, 2003.  ang.org/oforgeeksoint.com	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Colored Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Wol.  MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Indicate Web Development with LAMP using the Company of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Indicate Web Development with LAMP using the Company of Scripting Language of Scripti	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition,  gs", 3rd
AngularJS Developrodel Modes, One angularJS Forms.  acture Periods:45 ext Books  David Flanagan, "O'Reilly Publication O'Reilly, "Learning Edition, O'Reilly Publication, O'Reil	JavaScrions, 2020 g PHP, Mublication Brian De World of Christian Ind Yukih OpenSon In, 2003. ang.org/of forgeeks oint.com Ispoint.c	vironment, Expressions in AngularJS, Ading, Two Way Binding, AngularJS Colored Tutorial Periods: 0 P  pt: The Definitive Guide: Master the Wol.  MySQL, JavaScript, CSS & HTML5: A Sens, 2014.  Foy, Larry Wall, Jon Orwant," Program of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Indicate Web Development with LAMP using the Company of Scripting Languages", 1st Edition, Will Heilmann, "Beginning JavaScript with Indicate Web Development with LAMP using the Company of Scripting Language of Scripti	orld's Step-b ming ey Pu Dom s	eal Per  Most-L y-Step Perl", 4 blicatio	Jsed Pr Guide  4th Edit Dons, 200	ogram to Cre ion, O	Total Iming La Pating Dy Reilly M	Periods  nguage", namic W  edia,201	7 <sup>th</sup> Ed	CO5  dition,  gs", 3rd

COs					Pro	gram	Outcor	nes (P	Os)					gram Spo comes (F	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	2	-	-	-	-		-	1-1	n-	-	-	2	-	-
2	2	2	3	-	-	-	-	-	-	n-	-	-	2	-	-
3	2	2	3	2	-	-	-	-		-	-	-	2	_	-
4	2	2	-	-	-	-	n <b>-</b> v	-		-	-	_	2	-	_
5	2	3	3	-	-	-	-	-	-	-	-	-	2	-	-

# Correlation Level: 1 - Low, 2 - Medium, 3 - High Evaluation Methods

		Cor	ntinuous Asses	sment Marks (CA	AM)	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examinati on (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

 $<sup>^{\</sup>star}$  Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

# **OPEN ELECTIVES**

2. A.3. 100

Department	Ma	nagement	Studios	Dro	arommo	e: B.Tech					
Semester	V/		Otudies								<b>T</b> E
00.1100.01		•				egory Code Periods/W		End Seme			
Course Code	U2	3HSOC01							Maximur		
Course Name	IN.	TELLECTU	AL PROPERTY RIGHTS	1 1 1	<u>L</u>	T 0	P 0	C 3	25	75	100
			Comm	non to ALL I	Branche	es.				,,,	100
Prerequisite	Nil		(a)		4 1 7						
	On con		the course, the students			-				BT Ma (High Lev	hest
	CO1	The second contract of the second contract of	he Concept and Importan							K	2
Course Outcomes	CO2	infringeme					-			K	3
Outcomes	CO3		right laws to hypothetical							K	3
	CO4	Infer the infringeme	different types of trad nt issues.	lemarks and	d under	stand the	registrat	tion proc	ess and	K	4
	CO5		e legalities surrounding mechanisms.	industrial	designs,	geograph	ical indic	cations, a	nd their	K	2
UNIT-I	Overvie	w of Intelle	ectual Property					Per	iods: 9		
Mark, Design, conventions a Convention, W	Geograp nd agree IPO Con	hical Indica ements: W vention, Ma	ectual property right (IPR tion, Plant Varieties and <sup>T</sup> TO/TRIPS Agreement, F drid Agreement, Nice Agr	Trade Secre Paris Conve	: – Interr ntion. T	national pro he Berne	tection of	IPR- Mai	or Interna	ational	CO1
וו-דואע		v of Patent							iods: 9		
rocess and p	roduct F	atent, Lega	bject matter of Patent - Re al Requirements for Pate Infringement of Patents a	ents – Paten	t docum	nent: Speci	fication a	n-patenta nd Claim	ble Inven s - Grant	tions - ting of (	CO2
JNIT-III		v of Copyr	_			J. Sarry			iods: 9		
Registration Pr rends in Copyr pecial reference	ocedure, ights - R ce to soft	Assignmer elated Righ ware.	Subject matter of copyrique of copyrique of copyr ts: Celebrity Rights, Acad	ight - Infring	ement o	f Copyrigh	ts and Re	emedies -	Emergin	a new	003
JNIT-IV	No. of the last of	v of Trader					1		iods: 9	1766	
Registration of icensing of tra Deceptive simil	Tradema ademarks	arks - Grou s - Infringe	rks - Different kinds of nds for refusal of Registi nent, Remedies and Per nerging New trends in trad	ration: Absol nalties - Offe	ute Grou	und and R	elative Gr	round - A	ssianmer	t and	CO4
JNIT-V	and the same and the same and the same	ner Forms							ods: 9		
Remedies for Ir Secrets- Protector registration -	nfringeme tion for s Infringe	ent - Trade submission-	esign - Subject Matter - P secret Law-Determinatior Trade Secret litigation - I ographical indication - Rer	n of Trade So Meaning and	ecret Sta Nature	atus - Liabi of Geogra	lity for mis	sappropria	ations of	Trade	O5
ecture Period	s:45		Tutorial Periods: 0		Practio	cal Periods	s: 0	Total F	Periods:	45	3-7-12-12-12-12-12-12-12-12-12-12-12-12-12-
ext Books											
Limited	1, 2019.		ctual Property Rights: Pr					1991 (39)		India F	Private
eference Boo		riiusueep,	D. Intellectual Property R	ignts, 2 <sup>nd</sup> edi	uon, PH	Learning	Private Lii	mited, 201	გ.		
		w Relating t	o Intellectual Property Rig	thte 2nd ad:4:	on Lovie	a Novie 00	17	1			
2. Bouch	oux, Deb		o intellectual Property: The Lav					d Trade S	ecrets, 4 <sup>t</sup>	<sup>h</sup> edition	.,
3. Gangu	li P. Intel	lectual Prop	perty Rights: Unleashing the operty Rights, 2 <sup>nd</sup> edition,				/lcGraw-H	ill Publish	ing Comp	any; 202	22.
Oyou ix	attan. IIII	oncolual FI	operty ragnits, 2" Euition,	Dilalat Law	i iouse, 2	ZUZ4.					

5.	Surendra Malik and Sudeep Malik, Supreme Court on Intellectual Property, Eastern Book Company, 2022.
	eferences
1.	https://www.wipo.int/about-ip/en/
2.	the starte (basics/gaperal-information-patents
3	https://www.wto.org/english/tratop_e/trips_e/trips_e.htm
1	https://www.eno.org/about-us/annual-reports-statistics/annual-report.html
5.	https://articles.manupatra.com/article-details/Patent-Types-Laws-related-to-them-in-India
6.	https://www.inta.org/trademarks/trademark-basics/.

# \*TE-Theory Exam, LE-Lab Exam

COs/POs/PSOs Mapping

COs/P	OS/PSC	os map	ping												
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
(COs)							2	2		2	1	2	1	2	2
CO1	1	1	-	-	-	3	2	2	-		1	-			
	-					2	2	_		2	1	1	1	1	2
CO2	1	2	-	2	-	3	2	2	-	2					
	<u> </u>									2		1	_	1	3
CO3	_	2	-	-	-	2	2	3	-	2		1	10.0		
000										2	1	1	1	1	2
CO4	1	1	_	1 =	-	3	2	2	-	2	1	1			
004	1				197						1	4	1	1	2
CO5	1	2	-	-	-	3	3	2	, . <del></del>	2	1	1	111		
000											7				

Correlation Level: 1 - Low, 2 - Medium, 3 - High

		Int	ernal Assess	sment Marks (IAM)	1114	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Manag	ement Studies	Programme	B. Tech					
Semester	V/VI		Course Cate		e: OE	*End Sei	nester Exa	m Type:	TE
Course Code			Pe	eriods/Wee	ek	Credit	Maximu	m Marks	3
	U23HS		L	Т	Р	С	CAM	ESE	TM
Course Name	NEW F	RODUCT DEVELOPMENT	3	0	0	3	25	75	100
		Common	to ALL Branche	s	1.0				
Prerequisite				1					
	On coi	mpletion of the course, the students	will be able to						pping hest vel)
	CO1	Explain the stages and importance of contexts.							2
Course	CO2	Apply market research to identify specifications.						К	(3
Outcomes	CO3	Illustrate the product concepts using viable option.	100.00					К	(3
	CO4	Examine product prototype that incorp for manufacturing.						К	3
	CO5	Analyze a business plan and market st	rategy for the su	ccessful la	aunch of	a new pro	duct.	K	4
UNIT-I		uction to New Product Development					eriods: 9		
Role of Innovat	ion and	uct Development (NPD) - Product Dev Creativity in NPD - Reverse Engineer ment in New Product Development - Su	ing and its Appl	lication in	NPD - I	Business	Models for	NPD - New	CO1
UNIT-II		Research and Customer Needs			. 6		eriods: 9		
into Product Sp	ecificatio	unities for New Products - Conducting ns - Establishing and Refining Product anding Consumer Behaviour: Surveys,	Specifications -	Competitiv	e Analy	slating Co	istomer Ne enchmarkir	eeds ng in	CO2
JNIT-III		ot Generation and Evaluation	r cous Groups, e	ind Ethnog	парпу	P	eriods: 9	1707	<del></del>
Design Thinking	for Nev	ess: Continuous and External Idea Sou Products - Techniques for Concept Goncepts - Concept Evaluation and Select	eneration - Syst	ematic Ex	ploration	of Conce	ning Soluti pts - Scre	ons - ening	CO3
VI-TINL		t Design and Development			- 1		eriods: 9		
Environmental Co	onsiderat	d its role in NPD - Modular vs. In tions - Organizing Product Developmen ns in Product Development - Tools fo	nt Teams - Stage	es of team	Develop	oment - C	ollaboration	and	CO4
JNIT-V		, Strategy and Commercialization					eriods: 9		
Product Busines Improvement an	ss Plan d Future	ct Strategy - Building Market Demand a - Preparing for Market Launch - Pos Product Enhancements							CO5
ecture Periods:	45	Tutorial Periods:	Practi	cal Period	ls:	Total Pe	riods: 45		
ext Books									
		SD. Product design and development.							
		nedetto A. New products management.							
		g at new products: Creating value throu	gn innovation. 5	" edition. E	Basic Bo	oks; 2017	(		
deference Books		management and now product develop	mant 6th adition	Daaman F	'al a a k' a .	- 0047			
		management and new product develop nentation works: The surprising power o					ovious Dans	2000	
		, B. The startup owner's manual: The s							
		y design: How design thinking transforn	A				-		<u> </u>
Diowii, i. C	Littman	y accigin flow accigin uninking dansion	no organizacions	and mopil	CO 111110V	auon. Ha	per public	33. ZUU	

#### Web References

- 1. https://conjointly.com/kb/
- 2. https://www.entrepreneur.com/article/281999
- 3. https://www.mindtools.com/pages/article/newSTR\_66.htm
- 4. https://www.interaction-design.org/literature/article/design-thinking-getting-started-with-empathy
- 5. https://www.productplan.com/glossary/product-architecture/
- 6. https://hbr.org/2019/09/why-design-thinking-works
- 7. https://www.smartsheet.com/new-product-development.
- 8. https://www.ptc.com/en/blogs/cad/best-practices-for-developing-new-products

# \*TE-Theory Exam, LE-Lab Exam

# COs/POs/PSOs Mapping

Course	PO1	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	Prog Outc	ram Spe omes (P	cific SOs)
Outcomes (COs)	POI	FU2	F03	104	1 00	. 00							PSO1	PSO2	PSO3
CO1	3	-	3	-	3	1	1	-	-	1	-	2	3	-	3
CO2	1	-	2	1	3	-	-	1	-	1	-	3	2	1	3
CO3	1	1	3	-	2	-	1	-	2	-	1	2	3	•	2
	3		1	1	3	1	-	1	2	_	1	1	1	1	3
CO4	3	_	l <sub>i</sub>	' .							1	2	3		3
CO5	1	-	3	-	3	-	-	-	2	-	7	2	3	_	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation wet	lious	Cor	tinuous Ass	sessment Marks (C	AM)	End Semester	Total Manda
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
	+			5	5	75	100
Marks	5	0	J	3			

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Mar	nagement	Studies	Progi	amme :	B.Tech					-
Semester	V/VI			Cour	se Categ	gory Code:	OE *E	End Sem	ester Exa	m Type:	TE
Course Code					P	Periods/We	ek	Credi	Maximu	m Marks	3
		HSOC03			L	T	Р	С	CAM	ESE	T
Course Name	FINA	ANCE FO	R ENGINEERS		3	0	0	3	25	75	10
			Comm	on to ALL Br	anches			I		.1	
Prerequisite	Nil										
	On co		of the course, the stud							BT Ma (Hig Lev	hest
	CO1	Explain differenti	the objectives, scope, ate between profit maxim	and role of f nization and we	inancial ealth ma:	managen ximization.	ent in e	ngineerir	ng, and	K	
	CO2	Apply the appraisa	e concepts of the time val I techniques such as NP\	alue of money /, IRR, and Pa	to engir yback P	neering pro	jects and	l use inve	estment	K	3
Course Outcomes	соз	Demons	trate the steps in the cand sensitivity analysis for	apital budgetin	g proce	ss and ap			e cost-	K	3
	CO4		financial statements, incing perspective, and eval							K	4
	COE		ing projects. different types of costs, s	such as fixed,	variable	e, and mar	ginal cos	ts, and e	valuate		
UNIT-I-	CO5	cost-ben	efit analysis and break-ev Financial Management	en analysis fo	r engine	ering decis	sion-maki	ng.	iods: 9	K	4
			nt: Objectives, Scope, ar		nineering	a - Financ	ial Planni			Short	
erm and Long-Te Financial Decisi	rm Pla	inning - Ba	asic Concepts: Profit Max ationship between Financ	imization vs V	lealth M	aximizatio	n - Role d	of Engine	ering Mai	nagers	CO,
JNIT-II			f Money and Investment						iods: 9		
Calculations - Inve	estmen	t Apprais	Importance and Applica al Techniques: Payback ((PI) - Risk Analysis in In	Period, Net P	resent \	/alue (NP)	resent V V), Intern	alue and al Rate d	f Future of Return	Value (IRR)	CO2
INIT-III			eting for Engineering P	•					iods: 9	L	***************************************
Capital Budgeting Stimation for Pro Evaluation.	Proce ject, C	ess: Step ost - Ben	s and Key consideration efit Analysis in Engineer	ns, Technique ring Project, S	s for E ensitivity	valuating y Analysis	Engineer , and De	ing Proje cision Tr	ect, Casl ees for F	n-Flow Project	CO3
JNIT-IV	Fina	ncial Sta	tements and Ratio Anal	ysis				Per	iods: 9		
statement Interpre	etation	<ul> <li>Financi</li> </ul>	nts: Balance Sheet, Inc al Ratios: Liquidity, Pro alysis in Engineering Proj	fitability - Eng	nt, and ineering	an Engin Case St	eering Poudies on	erspectiv Financia	e on Fir al Perforr	ancial nance	CO
NIT-V	Cos	t Estimati	ion and Engineering Eco	onomic Analy					iods: 9		
nalysis in Engine conomic Analysis	ering : Repla	Projects,		Costs: Fixed, d Its Applicati	on in E	ngineering	Decision	Making	- Engin	eering (	CO5
ecture Periods:	45		Tutorial Periods: 0		Practica	al Periods	: 0	Total	Periods:	45	
ext Books  1. Sullivan V	IC \A!	oko ENA 14	colling CD. Casianasia. 5	-0000 47th	a diti	D					
			oelling CP. Engineering E en F. Principles of Corpor			20 Car 20 M 22 M		t:			
			en F. Principles of Corpor Fundamentals of Financia								
eference Books	.i-, HOI	JOLUIT JF. I	unuamentais oi Financia	ıı ıvıarıagemen	ı. 15"' ec	aition. Cen	Jage Lea	ming; 20	19.		
	hBIC	inha KK	Financial Managament for	r Engineera 4	h	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	blishir '	Iaa 00	40		
			Financial Management for ingineers: Evaluation and				_		118.		
eb References	r. rm	ance for E	ingineers. Evaluation and	runding of Ca	ipilai Pro	ojects. Spri	nger; 201	1.	.,		
	M Pol-	to ===-/	ortol/2005:/5-1/5								
1. https://ww			oortal/resource/articles/fina com/ask/answers/033015/								

- 3. https://omnicard.in/blogs/capital-budgeting-24042024
- 4. https://www.linkedin.com/pulse/role-capital-budgeting-process-engineering-studies-ashraf
- 5. https://corporatefinanceinstitute.com/resources/accounting/financial-ratios/
- 6. https://www.dau.edu/acquipedia-article/engineering-cost-estimation-method

# \*TE-Theory Exam, LE-Lab Exam

# COs/POs/PSOs Mapping

Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12		ram Spe omes (P	
(COs)													PSO1	PSO2	PSO3
CO1	1	2		-	g =	1	1	. 1	-	2	1	1	1	1	2
CO2	1	2	1	-	1	2	1	2	-	3	1		1	2	3
CO3	-	3	3	-	1	3	1	2	-	3	1	1	1	2	3
CO4	1	2	=	2	1	1	2	1	1	2	1	-	2	1	2
CO5	-	3	-	-	2	3	2	2	1	2	2	3	2	2	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

		ln	ternal Assess	sment Marks (IAM)		End Semester	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Manac	ement Studies	Programme: E	3 Tech								
Semester	V/VI	ement otudies	Course Categ		· OF	*End Sc	meeter Eva	m Type	TE			
ocinester	V/VI	and the second s		Credi	d Semester Exam Type: TE redit Maximum Marks							
Course Code	U23HS	6OC04		iods/Wee	_		CAM	ESE TM				
Course Name	L T P C CAM     ECONOMICS FOR ENGINEERS   3   0   0   3   25											
		Common to	ALL Branches					V				
Prerequisite	Basic	s of Economics										
- revergines	On coi	mpletion of the course, the students wi	ill be able to		1		1-	(Hig	apping hest vel)			
= =	CO1	analysis and forecasting techniques.										
Course	CO2	Discuss production functions and cost structures to evaluate their impact on managerial										
Outcomes	соз	Examine various market structures an market behavior and competitive dynami		gies, syı	nthesizii	ng their	effects on	К3				
	CO4	Apply macroeconomic policies and their implications on business cycles investment										
	CO5	Analyze recent economic trends, sur inequality.	ch as technolo	ogical ac	lvancen	nents ar	id income	к	4			
UNIT-I	Introd	uction to Managerial Economics	1				Periods: 9					
Demand, Elastic curve and move Quantitative Met	ity of De ment alo hods.	Meaning, Scope, and Importance - Function mand, Law of Supply, Elasticity of supplying with the curve - Demand Forecasting	and Market Equ	uilibrium -	- Compa	arative st ng - Qua	atistics: Shi litative Meth	ft of a	CO1			
UNIT-II		ction Function and Cost Concepts					Periods: 9					
returns to scale	e - ISO	aning, Types, Applications in Managerial Quants - Producer Surplus: Price ceiling ost - Revenue Concepts: Total Revenue (	and price floor	r - Cost	concept	: Types	of Costs -	Total,	CO2			
UNIT-III		t Structure					Periods: 9					
Based Pricing,	Demand	Competition, Monopoly, Monopolistic Co - Based Pricing, Competition - Based Pric Price Discrimination, Premium Pricing and	cing, Psychologic	poly and cal Pricin	Duopo g, Geog	ly - Pricir graphical	ng policies: Pricing, Dyr	Cost- namic	CO3			
UNIT-IV	000000000000	economics				the state of the s	Periods: 9					
income - Mone	tary polic	mic Policies - National Income Concepts by and Fiscal Policy - Business Cycles of gn Institutional Investment (FII).							CO4			
UNIT-V		Trends in Economics					Periods: 9					
Automation in É Economies - Inco	conomic ome In - e	merce, Fintech, and Online Services - Decision-Making - Gig Economy : Grov equality : Causes, Effects, and Socio - pol	wth of Freelance itical Impact	e and Co	ontract '	Work - I	mpact on G		CO5			
Lecture Periods	: 45	Tutorial Periods:	Practica	al Period	ls:	Total P	eriods: 45					
Text Books		- IM					. a4h		<i>r</i> .			
2020.		am F., and Marks, Stephen G. Manageria				is, and C	ases, 10 <sup>ur</sup> e	dition, V	viley,			
		ciples of Managerial Economics, 7 <sup>th</sup> editio										
		anagerial Economics, 3 <sup>rd</sup> edition., Himalay	ya Publishing Ho	ouse,202	l							
Reference Book		tormodiato Migraconomics: A Mada A	proach Oth a dist	on 14/14	/ Nada	0 00	2004 2044					
		termediate Microeconomics: A Modern Ap A., Smith Jr., Clifford W., and Zimmerman						Archited	cture,			
7 <sup>th</sup> edition	on., McG	raw-Hill Education, 2016. I, and Nordhaus, William. Economics, 20 <sup>th</sup>					2					
		Schotter, Andrew J. Introduction to Micro				·	g, 2012.					

	Moore, James C. Economic Theory and Operations Analysis, 2 <sup>nd</sup> edition., Academic Press, 1970.
5.	Moore, James C. Economic Theory and Operations and Special Control of the Control
Web R	eferences
1.	https://www.jaroeducation.com/blog/nature-and-types-of-managerial-economics/
2	https://psu.ph.unizip.org/introductiontomicroeconomics/cnapter/cnapter-o-costs-and production-
2.	https://corporatefinanceinstitute.com/resources/economics/market-structure.
3.	https://www.britannica.com/money/macroeconomics
4.	https://www.britannica.com/money/macrocostrom/us/en/insights/economy/global-economic-outlook/weekly-update.html
5.	https://www2.deloitte.com/us/en/insignts/economy/global-cochomic states and y

# \*TE-Theory Exam, LE-Lab Exam

COs/POs/PSOs Mapping											Program Specific Outcomes (PSOs)				
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
(COs)					1	1				2	2		1	1	1
CO1	1	1	1	-		<u>'</u>				3	3	3	1	1	1
CO2	1	1	1	2	2	2	2			3	-			1	1
	1	1	1	2	_	2	2			3	-	3	1	1	-
CO3	1	<u>'</u>	<u> </u>		2	2	2	2		3	3	3	1	1	-
CO4	1	1	-	2	2	2			-	-		3	1	1	1
CO5	1	1	1	2	2	-	2	2		3	3	3		<u> </u>	,

Correlation Level: 1 - Low, 2 - Medium, 3 - High

valuation Metho	ods	Conti	nuous Assessme	End Semester Examination	Total Marks			
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	(ESE) Marks	100	
			5	5	5	75		
Marks	5	5	3			Carling Shalls and		

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department Semester	84-	nputer Science and Engineering	Programm	ne: B. Tecl	h				
	ivian	agement Studies	Course Ca	ategory Co	do: OF	Ja. —			
Course Code	LISSI	150007	F	Periods/We	ue: UE	*End Sem	ester Ex	am Typ	e: T
Course Name		HSOC05	L			Credit	Ma	aximun	n Ma
oodise Name	MAR	KETING MANAGEMENT	3	T 0	Р	С	CAM	ESE	TI
		Common to	ALL Branche	1	0	3	25	75	100
Prerequisite		Common to	ALL Branche	es	nn - 71	7			
	On co	Explain the importance of marketing Apply the consumer decision making	and differentia	to hat	n marketi	ng and soll	ina	BT Ma (Hig Lev	hest
Course	CO2	consumer buying behavior	g process and	differentia	te betwe	en industri	ial and	K	2
Outcomes	CO3	Examine product life cycle managem	nent strategies	and dome			idi dila	K	3
	CO4	illustrate the role of distribution ober		and demo	nstrate ti	ne steps in	volved	K	3
		strategy for both consumer and industrial	trial goods.	ign an effe	ective cha	annel distri	bution	V2	
	COE	Analyze emerging trends in marketir and experiential marketing strategies.		ustomer F	Relations	nin Manage	omont	K3	
INIT-I	Introdu	lotion 1 - III .					1	K4	
larketing - Importa	anco of	Manta di	ofine LO		4	Periods: 9			
Tamelius Environn	nent fact	Marketing - Difference between Marketors, Importance of environment analy aning process and Steps in strategic p	eurig and Selli	ng - Marke	eting Env	rironment:	The Mac	ero	
aniework of Strate	egic plar	ning process and Stens in strategie a	sis – Strategio	Marketing	planning	a: Introduct	ion Na-	\d	
Ps of Marketing		and otops in strategic b	lanning Ethic						
A Films			ianning - Euric	al and Soc	ial Resno	neihility of	Maria :	;u, c	:01
		man D. I.		ar and ooc	iai Kespo	onsibility of	Marketii	ng '	01
		man D. I.		ar and ooc	iai Kespo	onsibility of	Marketii	ng '	01
ole of buyer - Typ	oc of D	ner Behaviour and Marketing Strate	еду	ai una 000	iai Kespo	onsibility of	Marketii	ng	01
ole of buyer - Typ	es of Bu	ner Behaviour and Marketing Strate uying behavior - Factors influencing b	egy Duying decision	as and ood	P	eriods: 9	Marketii	ng	01
ole of buyer - Typ eaning and Step ganizational marke	es of Bustin Co	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior and making Process	egy Duying decision Organization	ns - Consu	P mer deci	eriods: 9	Marketii	ng	01
ole of buyer - Typ eaning and Step ganizational marke	es of Bustin Co	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior and making Process	egy Duying decision Organization	ns - Consu	P mer deci	eriods: 9	Marketii	ng	
ole of buyer - Typ eaning and Step ganizational marke eds, Classification	es of Bustines of Control of Cont	ner Behaviour and Marketing Strate Lying behavior - Factors influencing behavior and making Process Ligaracteristics, Difference between Indugnificance — Targeting, Positioning and	egy Duying decision Organization Istrial and Cordination	ns - Consu nal buying nsumer bu Strategies.	Pamer deci	eriods: 9 sion makin our: Classi arket Segn	Marketing proce ification nentation	ss: of	O1 O2
pole of buyer - Typ eaning and Steps ganizational marke eeds, Classification IIT-III	pes of Bus in Coets, Chan and Signoduct	ner Behaviour and Marketing Strate Lying behavior - Factors influencing behavior - Factors influencing behavior - Factors influencing behavior - Factors influences ensured by the strategistics of th	egy Duying decision Organization Istrial and Cord Competitive S	ns - Consu nal buying nsumer bu Strategies.	Pimer deci	Periods: 9 Ision making our: Classiarket Segn	Marketiing proce ification nentation	ss: of	
pole of buyer - Type eaning and Steps ganizational marketeds, Classification   IIT-III   Diduct classification portance and Steps	pes of Bi s in Co ets, Cha n and Sig Product	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Factors influencing behavior - Factors influencing behavior - Factors influencing Process - Factoristics, Difference between Indugnificance - Targeting, Positioning and Pricing Mix  duct Life cycle - Strategies for management of the Process of the Proc	puying decision Organization Organization Organization Official and Cord Competitive S	ns - Consu nal buying nsumer bu Strategies.	Per Per Per Per Per Per Per Per Per Per	Periods: 9 ision makin our: Classi arket Segn	Marketing proce ification nentation	ss: of n -	
pole of buyer - Type eaning and Steps ganizational marketeds, Classification   IIT-III   Diduct classification portance and Steps	pes of Bi s in Co ets, Cha n and Sig Product	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Factors influencing behavior - Factors influencing behavior - Factors influencing Process - Factoristics, Difference between Indugnificance - Targeting, Positioning and Pricing Mix  duct Life cycle - Strategies for management of the Process of the Proc	puying decision Organization Organization Organization Official and Cord Competitive S	ns - Consu nal buying nsumer bu Strategies.	Per Per Per Per Per Per Per Per Per Per	Periods: 9 ision makin our: Classi arket Segn	Marketing proce ification nentation	ss: of n -	
ple of buyer - Type aning and Steps ganizational markeds, Classification and Steps ganization and Classification contance and Steps gan gang gang gang gang gang gang gang	ees of Bus in Colets, Chain and Sign Product	ner Behaviour and Marketing Strate Lying behavior - Factors influencing Process - Factors influence - Industrial Process - Factors influence - Industrial Process - Factors influence - Factors influence - Factors influence - Factors influence - Factors influence - Factors influence - Factors influence - Factors influence - Factors influence - Factors influence - Factors influence - Factors influencing behavior - Factors influencing	puying decision Organization Organization Organization Official and Cord Competitive S	ns - Consu nal buying nsumer bu Strategies.	Per Per Per Per Per Per Per Per Per Per	Periods: 9 ision makin our: Classi arket Segn	Marketing proce ification nentation	ss: of n -	O2
ple of buyer - Type aning and Steps ganizational markeds, Classification liT-III poduct classification portance and Steps ds of packaging advantages of laber IT-IV	pes of Bus in Coets, Chan and Signature Productors in New and a celling — Face an	ner Behaviour and Marketing Strate Lying behavior - Factors influencing behavior - December - Packaging:  duct Life cycle - Strategies for manager of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies	puying decision Organization Istrial and Cord Competitive Signing Product I Need for pacing: Functions,	ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es	Permer decide behavior of the property of the	eriods: 9 sion makin our: Classi arket Segn eriods: 9 ries of Nev ualities of p	Marketing proce ification nentation w produce packaginages ar	ss: of n - ct, g, nd co	
pole of buyer - Type aning and Steps ganizational marketeds, Classification IIT-III poduct classification contance and Steps ds of packaging advantages of labeted IT-IV Fribution Channel at the pole of the packaging and the packaging advantages of labeted IT-IV Fribution Channel at the packaging and the packaging advantages of labeted IT-IV Fribution Channel at the packaging and the packaging and the packaging advantages of labeted IT-IV Fribution Channel at the packaging and	pes of Bi s in Co ets, Cha n and Siq Product ns - Pro os in Nev and a elling - F	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing Process - Factoristics, Difference between Indugrificance - Targeting, Positioning and Pricing Mix  duct Life cycle - Strategies for manage of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix	puying decision Organization Or	ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es Types o	Per Catego sential que f labellin	eriods: 9 sision making our: Classifarket Segniteriods: 9 ries of New palities of page advanta	Marketing proce ification nentation w production packaginages ar	ss: of n - ct, g, nd Co	O2
pole of buyer - Type eaning and Steps ganizational marketeds, Classification of the contance and Steps ds of packaging advantages of labeted tribution Channel at hannels of distribution and steps of distribution channels of distribution channels and steps of distribution channels and steps of distribution channels of distribution channels of distribution channels and steps of distribution channels are steps of distribution channels and steps of distribution channels are steps of distribution channels	pes of Bus in Coets, Charand Signary Productors - Proposin New and a celling - For and Physican for the productors - For and Physican for the productors - For and Physican for the production of the production for the production of the	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing Process - Factoristics, Difference between Indugrificance - Targeting, Positioning and and Pricing Mix  duct Life cycle - Strategies for manager of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations	puying decision Organization Istrial and Cord Competitive Section  ging Product I Need for pacing: Functions,  ance of distribution	ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es Types o	Percentage of the property of	eriods: 9 sision making our: Classificated Segnitives of New Lalities of page advantage of page advantage of page advantage of page of	Marketing proce ification nentation w production ages ar	ss: of n - ct, g, nd co	O2
pole of buyer - Type eaning and Steps ganizational marketeds, Classification of the contance and Steps ds of packaging advantages of labeted tribution Channel at hannels of distribution and steps of distribution channels of distribution channels and steps of distribution channels and steps of distribution channels of distribution channels of distribution channels and steps of distribution channels are steps of distribution channels and steps of distribution channels are steps of distribution channels	pes of Bus in Coets, Charand Signary Productors - Proposin New and a celling - For and Physican for the productors - For and Physican for the productors - For and Physican for the production of the production for the production of the	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing Process - Factoristics, Difference between Indugrificance - Targeting, Positioning and and Pricing Mix  duct Life cycle - Strategies for manager of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations	puying decision Organization Istrial and Cord Competitive Section  ging Product I Need for pacing: Functions,  ance of distribution	ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es Types o	Percentage of the property of	eriods: 9 sision making our: Classificated Segnitives of New Lalities of page advantage of page advantage of page advantage of page of	Marketing proce ification nentation w production ages ar	ss: of n - ct, g, nd co	O2
pole of buyer - Type eaning and Steps ganizational marketeds, Classification of the contance and Steps ds of packaging advantages of labeted tribution Channel at hannels of distribution and steps of distribution channels of distribution channels and steps of distribution channels and steps of distribution channels of distribution channels of distribution channels and steps of distribution channels are steps of distribution channels and steps of distribution channels are steps of distribution channels	pes of Bus in Coets, Charand Signary Productors - Proposin New and a celling - For and Physican for the productors - For and Physican for the productors - For and Physican for the production of the production for the production of the	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing Process - Factoristics, Difference between Indugrificance - Targeting, Positioning and and Pricing Mix  duct Life cycle - Strategies for manager of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations	puying decision Organization Istrial and Cord Competitive Section  ging Product I Need for pacing: Functions,  ance of distribution	ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es Types o	Percentage of the property of	eriods: 9 sision making our: Classificated Segnitives of New Lalities of page advantage of page advantage of page advantage of page of	Marketing proce ification nentation w production ages ar	ss: of n - ct, g, nd co	02
ple of buyer - Type aning and Steps ganizational marketeds, Classification litrill poduct classification contance and Steps ds of packaging advantages of labeted litribution Channel a hannels of distribution polysical distribution motion — Introduction	pes of Bi s in Co ets, Cha n and Sig Product ns - Pro os in Nev and a elling - F Place an and Phy ution for on - Pro ion to Int	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing Process - Factoristics, Difference between Indugnificance - Targeting, Positioning and and Pricing Mix  duct Life cycle - Strategies for manager of Product Development - Packaging:  dvantages of packaging - Labelline Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importation  consumer and industrial goods - Physical Marketing Communication  egrated Marketing Communication	puying decision Organization Istrial and Cord Competitive Section  ging Product I Need for pacing: Functions,  ance of distribution	ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es Types o	Percentage of the property of	eriods: 9 sision making our: Classificated Segnitives of New Lalities of page advantage of page advantage of page advantage of page of	Marketing proce ification nentation w production ages ar	ss: of n - ct, g, nd co	02
pole of buyer - Type aning and Steps ganizational marketeds, Classification with the contained and Steps do for packaging advantages of laberation of the contained and Steps do for packaging advantages of laberation Channel at the contained and t	pes of Bus in Coets, Chan and Sign Product on Sin New and a selling – For and Phyution for production to Intereds in the services of the servi	ner Behaviour and Marketing Strate Lying behavior - Factors influencing behavior - Process - Industrial Strategies, Difference between Industrial Griding Mix  duct Life cycle - Strategies for manager of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations on Strategies on Strategies  motion: Objectives, Types of sales pregrated Marketing Communication	puying decision Organization Istrial and Cord Competitive Signing Product I Need for pacing: Functions, Inches of distributions of the product I Inches  ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es Types o ution chanr on: Meaning	Permer decide behavior of the permer decide	eriods: 9 sision making our: Classificated Segnated Segna	Marketing proce iffication nentation was produced ages are a decision proponer e aler sale	ss: of ct, g, and consists es co	02	
pole of buyer - Type aning and Steps ganizational market ganizational market ganizational market ganizational	pes of Bus in Coets, Chan and Sign Product on Sin New and a celling – For and Phyution for production for to Interends in Marketin	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Process for managering and Pricing Mix  duct Life cycle - Strategies for managering behavior - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations and industrial goods - Physical motion: Objectives, Types of sales regrated Marketing Communication  Marketing	puying decision Organization Istrial and Cord Competitive Signing Product I Need for pacing: Functions, ance of distributions or product I sical Distribution	ns - Consunal buying nsumer bu Strategies.  Life cycle - kaging, Es Types oution channon: Meaning nsumer, S	Permet decide by behavior of the property of t	eriods: 9 riods: 9 riods: 9 riods: 9 riods: 9 riods: 9 rnel design rives and co	Marketing proce ification nentation w product packaging ages are not decision proper in d	ss: of ct, g, and co	02
pole of buyer - Type aning and Steps ganizational market ganizational market ganizational market ganizational	pes of Bus in Coets, Chan and Sign Product on Sign New and a selling – For and Phyution for production for production for to Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Marketin on Sign Production for the Intereds in Sign Production for the I	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing Mix  and Pricing Mix  duct Life cycle - Strategies for manage of Product Development - Packaging: dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations and industrial goods - Physimotion: Objectives, Types of sales regrated Marketing Communication  Marketing  G - Customer Relationship Manage	puying decision Organization Istrial and Cord Competitive Signing Product I Need for pacing: Functions, Increase of distribution or product I Sical Distributi	ns - Consunal buying nsumer bu Strategies.  Life cycle - kaging, Es Types oution channon: Meaning nsumer, S	Per Per Per Per Per Per Per Per Per Per	eriods: 9 sion makinour: Classiarket Segn eriods: 9 ries of New ualities of p g, advanta riods: 9 nnel design ives and co on and De	Marketing proce ification nentation was produced ackaging ages are decision omponer ealer sale	ss: of ct, g, nd co	02
ple of buyer - Type aning and Steps ganizational marketeds, Classification with the classification or tance and Steps ds of packaging advantages of laberation Channel at hannels of distribution Channel at hannels of distribution motion — Introduction — Introduc	pes of Bus in Coets, Charles in And Signal And And And And And And And And And And	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Factors influence - Industriation - Targeting, Positioning and and Pricing Mix  duct Life cycle - Strategies for manage of Product Development - Packaging: dvantages of packaging - Labellin Pricing objectives - Pricing strategies of Promotion Mix  sical distribution: Meaning and Importations objectives, Types of sales promotion: Objectives, Types of sales prograted Marketing Communication  Marketing  G - Customer Relationship Manage of distributions and benefits - Mobile I	puying decision Organization Istrial and Cord Competitive States  ging Product I Need for pacting: Functions,  ance of distribution Sical Distribution Competitive States  ment: Definition Marketing: Definition	ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es Types o ution chann on: Meaning nsumer, S	Penel - Charge, Object alespers	prisibility of deriods: 9 deriods	Marketing may proce ification mentation mentat	ss: of n - C  ct, g, nd co	02
ple of buyer - Type aning and Steps ganizational marketeds, Classification with the classification or tance and Steps ds of packaging advantages of laberation Channel at hannels of distribution Channel at hannels of distribution motion — Introduction — Introduc	pes of Bus in Coets, Charles in And Signal And And And And And And And And And And	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Factors influence - Industriation - Targeting, Positioning and and Pricing Mix  duct Life cycle - Strategies for manage of Product Development - Packaging: dvantages of packaging - Labellin Pricing objectives - Pricing strategies of Promotion Mix  sical distribution: Meaning and Importations objectives, Types of sales promotion: Objectives, Types of sales prograted Marketing Communication  Marketing  G - Customer Relationship Manage of distributions and benefits - Mobile I	puying decision Organization Istrial and Cord Competitive States  ging Product I Need for pacting: Functions,  ance of distribution Sical Distribution Competitive States  ment: Definition Marketing: Definition	ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es Types o ution chann on: Meaning nsumer, S	Penel - Charge, Object alespers	prisibility of deriods: 9 deriods	Marketing may proce ification mentation mentat	ss: of n - C  ct, g, nd co	02
pole of buyer - Type aning and Steps ganizational marketing ganizati	pes of Bus in Coets, Charles in And Signal And And And And And And And And And And	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Factors influence - Industriation - Targeting, Positioning and and Pricing Mix  duct Life cycle - Strategies for manage of Product Development - Packaging: dvantages of packaging - Labellin Pricing objectives - Pricing strategies of Promotion Mix  sical distribution: Meaning and Importations objectives, Types of sales promotion: Objectives, Types of sales prograted Marketing Communication  Marketing  G - Customer Relationship Manage of distributions and benefits - Mobile I	puying decision Organization Istrial and Cord Competitive States  ging Product I Need for pacting: Functions,  ance of distribution Sical Distribution Competitive States  ment: Definition Marketing: Definition	ns - Consu nal buying nsumer bu Strategies. Life cycle - kaging, Es Types o ution chann on: Meaning nsumer, S	Penel - Charge, Object alespers	prisibility of deriods: 9 deriods	Marketing may proce ification mentation mentat	ss: of n - C  ct, g, nd co	02
ple of buyer - Type aning and Steps ganizational marketeds, Classification with the classification or tance and Steps ds of packaging advantages of laberation Channel at hannels of distribution Channel at hannels of distribution motion — Introduction — Introduc	pes of Bus in Coets, Charles in And Signal And And And And And And And And And And	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Difference between Induging and Pricing Mix  duct Life cycle - Strategies for manage of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations on Marketing Communication  Marketing  g - Customer Relationship Manage  ng, strategies and benefits - Mobile Interest of digital marketing - Inbound marketing - Market	puying decision Organization Istrial and Cord Competitive States  ging Product I Need for pacing: Functions,  ance of distribution promotion: Contempt Definition Marketing: Definition Marketing: Meaning, importance,	ns - Consunal buying nsumer bu Strategies.  Life cycle - kaging, Es Types of the cycle on the cycle of the cy	Penel - Charge, Object alespers	prisibility of deriods: 9 deriods	Marketing may proce ification mentation mentat	ss: of n - C  ct, g, nd co	02
pole of buyer - Type aning and Steps ganizational marketing ganizati	pes of Bus in Coets, Charles in And Signal And And And And And And And And And And	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Difference between Induging and Pricing Mix  duct Life cycle - Strategies for manage of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations on Marketing Communication  Marketing  g - Customer Relationship Manage  ng, strategies and benefits - Mobile Interest of digital marketing - Inbound marketing - Market	puying decision Organization Istrial and Cord Competitive States  ging Product I Need for pacting: Functions,  ance of distribution Sical Distribution Competitive States  ment: Definition Marketing: Definition	ns - Consunal buying nsumer bu Strategies.  Life cycle - kaging, Es Types of the cycle on the cycle of the cy	Penel - Charge, Object alespers	eriods: 9 sision making of the color: Classificated Segments of New parties of New parties of page, advantatives and color and Design of the color and Design of the color and page of the color and p	Marketing proce ification nentation we produce packaging ages are processed in decision properties and processed in the proce	ss: of n - C  ct, g, nd  consists es  con con con con con con con con con co	02
pole of buyer - Type aning and Steps ganizational market geds, Classification with the contained and Steps gadvantages of laberation of the contained and steps gadvantages of laberation of the contained and stribution of the contained stribution of the contained and stribution of the contained stribution of t	pes of Bus in Coets, Charles in And Signal And And And And And And And And And And	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Difference between Induging and Pricing Mix  duct Life cycle - Strategies for manage of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations on Marketing Communication  Marketing  g - Customer Relationship Manage  ng, strategies and benefits - Mobile Interest of digital marketing - Inbound marketing - Market	puying decision Organization Istrial and Cord Competitive States  ging Product I Need for pacing: Functions,  ance of distribution promotion: Contempt Definition Marketing: Definition Marketing: Meaning, importance,	ns - Consunal buying nsumer bu Strategies.  Life cycle - kaging, Es Types of the cycle on the cycle of the cy	Penel - Charge, Object alespers	prisibility of deriods: 9 deriods	Marketing proce ification nentation we produce packaging ages are processed in decision proper aller sale portance arketing to between the processed in the pro	ss: of n - C  ct, g, nd  consists es  con con con con con con con con con co	02
pole of buyer - Type aning and Steps ganizational market ganizational market ganizational market ganizational market ganizational ganiz	pes of Bi s in Co ets, Cha n and Sig Product ns - Pro ps in New and a elling - F Place an and Phy ution for on - Pro ion to Int rends in Marketing: Meani ining, typ d marketing	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing be  Consumer decision making Process of a cacteristics, Difference between Industrict process of the process of t	puying decision Organization Istrial and Cord Competitive Signing Product I Need for pacing: Functions, ance of distribution Competitive Signing Product I Need for pacing: Functions, ance of distribution Comment: Definition Marketing: Definition Marketing: Meaning, importance, Cactical Period	ns - Consunal buying nsumer bu Strategies.  Life cycle - kaging, Es Types oution channon: Meaning nsumer, Son, feature finition and g, fundame metrices	Perces, Types of market	eriods: 9 sision makinour: Classiarket Segn eriods: 9 ries of New ualities of pag, advanta riods: 9 nnel design ives and coon and De riods: 9 s and imp f mobile m d difference eting analyte	Marketing proce ification nentation we produce packaging ages are not decision properties and decision	ss: of n - C  ct, g, nd  consists es  con con con con con con con con con co	02
pole of buyer - Type aning and Steps ganizational market ganizational market ganizational market ganizational market ganizational ganiz	pes of Bi s in Co ets, Cha n and Sig Product ns - Pro ps in New and a elling - F Place an and Phy ution for on - Pro ion to Int rends in Marketing: Meani ining, typ d marketing	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing be  Consumer decision making Process of a cacteristics, Difference between Industrict process of the process of t	puying decision Organization Istrial and Cord Competitive Signing Product I Need for pacing: Functions, ance of distribution Competitive Signing Product I Need for pacing: Functions, ance of distribution Comment: Definition Marketing: Definition Marketing: Meaning, importance, Cactical Period	ns - Consunal buying nsumer bu Strategies.  Life cycle - kaging, Es Types oution channon: Meaning nsumer, Son, feature finition and g, fundame metrices	Perces, Types of market	eriods: 9 sision makinour: Classiarket Segn eriods: 9 ries of New ualities of pag, advanta riods: 9 nnel design ives and coon and De riods: 9 s and imp f mobile m d difference eting analyte	Marketing proce ification nentation we produce packaging ages are not decision properties and decision	ss: of n - C  ct, g, nd  consists es  con con con con con con con con con co	02
pole of buyer - Type aning and Steps ganizational market ganizational market ganizational market ganizational market ganizational ganiz	pes of Bi s in Co ets, Cha n and Sig Product ns - Pro ps in New and a elling - F Place an and Phy ution for on - Pro ion to Int rends in Marketin g: Meani ining, typ d marketin de Marketin de Marketin	ner Behaviour and Marketing Strate  Lying behavior - Factors influencing behavior - Difference between Induging and Pricing Mix  duct Life cycle - Strategies for manage of Product Development - Packaging:  dvantages of packaging - Labellin Pricing objectives - Pricing strategies  d Promotion Mix  sical distribution: Meaning and Importations on Marketing Communication  Marketing  g - Customer Relationship Manage  ng, strategies and benefits - Mobile Interest of digital marketing - Inbound marketing - Market	egy Duying decision Organization Istrial and Cord Competitive Second for pacing: Functions, Indicate of distribution of the competition of the com	ns - Consunal buying nsumer bu Strategies.  Life cycle - kaging, Es Types of types of types of the cycle - kaging, Es Types of the cycle - kaging, Es Types of the cycle - kaging, Es Types of the cycle - kaging, Es Types of the cycle - kaging, Es Types of the cycle - kaging, Es Types of the cycle - kaging and the cycle -	Perces, Types of market	eriods: 9 sision makinour: Classiarket Segn eriods: 9 ries of New ualities of pag, advanta riods: 9 nnel design ives and coon and De riods: 9 s and imp f mobile m d difference eting analyte	Marketing proce ification nentation we produce packaging ages are not decision properties and decision	ss: of n - C  ct, g, nd  consists es  con con con con con con con con con co	02

### Reference Books

- 1. Prachi Gupta, Ashita Aggarwal, et al. "Marketing Management: Indian Cases" Pearson Education Limited, 2024
- 2. Arunkumar, Meenakshi.N, "Marketing Management" 3rd Edition, Vikas Publishing House, 2016
- 3. Rajan Saxena, "Marketing Management" 5th Edition, MacGraw Hill Publications, 2017

### Web References

- 1. https://www.ama.org/
- 2. https://www.marketingprofs.com/
- https://indianjournalofmarketing.com/
- 4. http://www.publishingindia.com/ijamm/
- 5. https://onlinecourses.swayam2.ac.in/imb20\_mg36/preview

### \*TE-Theory Exam, LE-Lab Exam

COs/POs/PSOs Mapping

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Pro Out	gram Sp comes (	ecific PSOs)
•													PSO1	PSO2	PSO3
CO 1	1	2	-	-	-	2	1	1	-	2	1	1	2	2	2
CO 2	1	2	1	-	1	2	1	2	-	2	1	1	2	2	2
CO 3	1	2	3	-	1	2	1	2	-	2	1	1	2	2	2
CO 4	1	1	3	-	2	. 1	2	1	1	2	2	1	2	2	2
CO 5	1	3	2	2	2	3	2	2	1	2	2	3	2	2	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Methods**

A 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Conti	nuous Assessme	ent Marks (CAM)		End Semester	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus`

# OPEN ELECTIVES

Department	Com	puter Science and Engineering	Progran	nme: <b>B.</b>	Tech				
Semester	V	Semeste	r Exam Typ	oe: <b>TE</b>					
Course Code	11230	CSOC01	Perio	ds/Wee	k	Credit	Ma	ximum Mar	ks
Course Coue	OZU		L	Т	Р	С	CAM	ESE	TM
Course Name	STR	UCTURED QUERY LANGUAGE	3	0	0	3	25	75	100
		(Offered to ECE, EEE, ICE, ME	CH, CIVIL,	BME ar	nd MECI	HTRONICS)	<u>1</u>		
Prerequisite		c Computer Knowledge							•••••••
	On ce	ompletion of the course, the students	s will be al	ole to				BT Mar (Highest	
	CO1	Develop the core concepts of SQL Q	ueries.					K	***************************************
Course Outcomes	CO2	Examine DDL and DML Commands.						K4	4
Outcomes	CO3	Examine DCL, DQL and TCL.						K4	
	CO4	Simplify Joins and Subqueries						K4	4
	CO5	Develop DCL and TCL commands.						K	
JNIT - I	SQL E	Basics		•••••••••••••••••••••••••••••••••••••••	Ī	Periods:09			
ntroduction to dat	abase –	History- Installation - Syntax -Data T	ypes - Se	lect – S	elect dis	tinct - Where	e – And –	Or – Not -	004
JUNISHAII ILS AND ILS	types.				······································				CO1
JNIT - II	DDL a	nd DML				Periods:09	,,,,,,		
		(DDL): Create – Alter: Add – Modify – age ( DML): Insert – Types of Insertion							CO2
JNIT - III	DQL,	Order by and Group by				Periods:09			
		ection – Aggregate Functions - Pattern	Matching.						CO3
Order by: asc – de JNIT - IV		ip by function.  Subquery and Views			T	Periods:09			
		oin. Subquery – Set Operations – View	10			renous.us			CO4
JNIT - V	<del>.</del>	nd TCL	J.		T	Periods:09			CO4
		: Commit – Rollback – Savepoint - Built	t-in Functio	ns.	L.,	1 011040.00			CO5
.ecture Periods:4		Tutorial Periods: 0	Practical		s: 0	To	tal Period		
ext Books									
. Abraham Silber	schatz, I	Henry F. Korth, and S. Sudarshan," Dat Performance Explained",1 <sup>st</sup> Edition, Mar	abase Sys	tem Con	cepts", 7	<sup>rtn</sup> Edition, Mc	:Graw-Hill E	Education,20	020.
		Il N. Weinberg, "SQL: The Complete Re					ion.2010.		
Reference Books					,				
1. Anthony DeBa	arros, "P	ractical SQL: A Beginner's Guide to Sto	rytelling w	ith Data"	, 2 <sup>nd</sup> Edi	tion, No Starc	h Press,20	22.	
2. Peter Carter,	"Pro SQI	L Server 2022 Administration: A Guide	for the Mod	dern DBA	\",1 <sup>st</sup> Ed	tion, Apress,2	2022.	VEL 0004	
		SQL for Data Scientists: A Beginner's Grannon Bradshaw, "MongoDB: The Defi							
		ring SQL Fundamentals", 2 <sup>nd</sup> Edition, O			aition, o	rromy wiedia,	1110., 2010.		
Veb References		Y152							
		n.com/community/conceptual-articles/a				•			•••••
		.com/6/28832/enterprise/databases/intr logs/dbms-database-management-syst		o-databa	ses.				
		iogs/dbms-database-management-syst ·g/learn/introduction-to-databases.	C1115/.						
		eg/course/view.php?id=740.							
. Hitps.//manarat	con.gov.	cg/cod/36/view.piip!id-/40.							

### \* TE – Theory Exam, LE – Lab Exam

		A .			Pro	gram C	utcom	es (PO	s)				Program Specifi Outcomes (PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	2	2	2	-	-		-	-	2	2	2	2	1
CO 2	3	3	3	3	2	-	-	-	2	-	2	2	3	3	2
CO3	3	3	3	3	2	-	-	"	2	-	2	2	3	3	2
CO 4	3	3	3	3	3	-	_	-	2	~	2	2	3	3	2
CO 5	3	3	3	3	3	-	-	-	2	-	2	2	3	3	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

		Con	tinuous Assessn	nent Marks (CAM)		End Semester Examination	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	(ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

**Evaluation Methods** 

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	outer	Science and Engineering	Pro	gramm	e B Te	ech				
Semester	V				ırse Ca			End Se	-mest	er Exam Ty	ne: TE
Course Code	U23C	soco	12		Periods		Cred			aximum Mar	
Course Name			R PERIPHERALS AND	<b>L</b>	<b>T</b>	<b>P</b>	3		<b>25</b>	<b>ESE</b> 75	<b>TM</b> 100
	NETW			CIV/II	DASE						
Prerequisite	NIL		ffered to ECE, EEE, ICE, MECH,	CIVIL,	BIVIE at	nd MEC	HTRO	VICS)			
7		mple	tion of the course, the stude	nte wi	ll he ah	lo to				DTM	
						ne to				BT Map (Highest	
Course	CO1	Orga	anize the system components and	memoi	ry.		***************************************			K3	
Outcomes	CO2	Deve	elop the motherboard designs and	l its con	nponent	S.				K3	}
	CO3	Clas	sify the various Storage devices.							K4	
	CO4	Exar	nine the purpose of various I/O pe	riphera	ıls.					K4	
	CO5	Cate	gorize various Networking Compo	nents.						K4	
UNIT - I	Introd	uctio	n to PC and Memory				Per	iods:09	)		
Evolution of Person	nal Comp	uters -	Overview of Systems and Comp	oonents	- Proce	essor M	lodes -	Modern	CPU	Concepts -	CO1
Alchitectural Fellor	mance re	eatures	s - Intel Core X-Series Processor y Organizations - Memory Consid	r - CPL	Over (	Clocking	- Feed	ntial Ma	mon	Concenta	
recririques - Selec	ung and ir	nstallin	g Memory - CPU Coolers.	Cration	3 - IVICII	юту тур	es - Or	IANE	viernory	y - iviemory	
UNIT - II			d Designs				Peri	ods:09		I.	
Active Motherboard	Factors - I s – Socke	IBM PO	C XT -IBM PC AT - The Baby AT -	- Micro-	AT -LP>	And M	ini-LPX	- ATX -	Mini-A	TX - NLX -	CO2
Expansion Slots -	DIMM.2 -	M.2 E	xpansion Card – PCIE GEN3 M.	.2 - Inte	el D8500	GB - Up	grading	a Moth	ner Boa	ard -DDR4	
boosi - Chipsets	- intel -M	on-inte	l Chipsets - North Bridge - South nectivity 802.11 AD WIFI - USB 3.	Bridge	- CMOS	S - Moth	nerboar	d BIOS	- RGB	Headers -	
UNIT - III	Power	supp	lies and storage devices	I GENZ	2 Contro	iler.	Peri	ods:09			
Power Supplies and	d Power N	Manag	ement - Modular - Non-Modular	- Conc	epts of	Switchi	na Rea	ulation	Poten	tial Power	CO3
- DVD Media - DVD	Drive.	ent - i n	e Floppy Disk Drive - Magnetic St	torage -	- Hard D	rive - S	SD- CD	-ROM E	Orive - I	DVD-ROM	003
UNIT - IV			als and Bus Architecture			Ī	Perio	ods:09		<u>l</u>	
Parallel Port - Signa Adapters - Mice - Ke	ils and Tir	ming D - Soun	iagram - IEEE1284 Modes - Asyr d Cards – ISA - PCI – AGP.	nchrono	us Com	munica	tion - S	erial Por	rt Signa	als - Video	CO4
UNIT – V			mponents				Perio	ods:09			
Introduction of Netw	ork Cable	e - Eth	nernet Cable - FIBER Optics – F	HUB - U	Jnmana	geable	Switch		geable	Switch -	CO5
Router – Modem - V	VI-FI - Acc	ess Po	oint - PCI Wireless Card - USB Wi	reless [	Device -	Print Se	erver.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	9040.0	Civitori	003
Lecture Periods:	45		Tutorial Periods: 0	Pract	tical Pe	eriods:	0	То	tal Pe	riods:45	
Text Books								-			
1.Stephen J Bigelow 2. Craig Zacker and	, "Trouble John Rou	Shoot	ting, maintaining and Repairing Po he complete reference: PC hardw	Cs", 5 <sup>th</sup>	Edition,	Tata Mo	cGraw-l	Hill, 201	7.		
3. Mike Meyers, "Intr	oduction t	to PC I	Hardware and Troubleshooting". 1	st Editio	on Tata	McGray	M-Hill 2	002			
4. B. Govindarajulu,	JRM BC 8	and Clo	ones hardware trouble shooting ar inner's Guide",1 <sup>st</sup> Edition, Tata Mo	nd main	tenance	" 1st Fd	ition, Ta	ata McG	raw-Hil	1 ,2002.	
Reference Books	iaiawaic.	A Deg	inner's Odide , is Edition, Tata Mic	CGIAW-F	7III , 20U	/1.					
1.Vishnu P," Compu	uter hardw	vare &	networking",2nd Edition, computed	h Publi	cations,	2021.					
<ol><li>Mastering Pc Har</li></ol>	dware An	d Netw	orking",1 <sup>st</sup> Edition, big Book ,2014 pairing PCs",21 <sup>st</sup> Edition, Pearson	4.							
<ol><li>Scott Mueller, "Up</li></ol>	grading ar	nd Rep	pairing Laptops", 3 <sup>rd</sup> Edition, Pears	on Edu	cation 2	2012					
5. Hans Peter Messm	er, "The li	ndispe	nsable PC Hardware Book".4th Ed	lition. A	ddison-\	<b>Nesley</b>	2001.				
Web References	u FC. A P	rogran	nmer's Guide to I/O, CPUs, and F	ixed Me	emory A	reas",2 <sup>n</sup>	<sup>a</sup> Editio	n, Pears	on Edu	ıcation,2000.	
1.https://www.course	ra.org/cou	urses?	query=computer%20hardware								
2.https://www.javatpo	int.com/c	ompute	er-hardware-and-networking-cours	se .							
4.https://www.tutorials	spoint.con	n/com	rn-computer-basics-hardware-netwouter_fundamentals/computer_net	working	n htm						
5 https://www.udemy	.com/cour	se/con	nputer-hardware-operating-system	n-and-n	etworkin	ıg.					

\* TE – Theory Exam, LE – Lab Exam

		v/l			·	gram C	Outcom	es (PO	s)			5.16.1	Pro Out	gram Spo	m Specific nes (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO 1	2	2	2	1	1	-	-	-		11447	2	2	2	1	1	
CO 2	2	3	2	2	2	-	-		<del></del>		2	2	2	1	1	
CO3	2	3	3	2	2	-	-	-	_		2	2	2	1	1	
CO 4	2	3	3	2	2	-	-	-	<del>                                     </del>		2	2	2	1		
CO 5	2	3	3	2	3	<u> </u>		-	-	1 9	2	2	2	2	1	

			Continuou	ıs Assessment Mar	ks (CAM)	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

# **ANNEXURE-II**

(Honours-Curriculum and Syllabi)

2 8.3. 118





### DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### **HONOURS/MINOR**

in

# **Cyber Security**



## **Curriculum and Syllabus**

2. 8-3-120

### ANNEXURE - II

### **DETAILS OF HONOURS/MINOR DEGREE**

### HONORS/MINOR IN CYBER SECURITY

			SEMESTE	R-VIII		li de					
SI.	Semester	Course	Course Title	Category	P	erioc	ls	Credits	М	ax. Maı	ks
No.	Semester	Code	Course Title	Category	L	Т	P	Credits	CAM	ESM	Total
The	ory										
1	IV .,	U23CSX401	Cyber Security Essentials	PC	3	1	0	4	25	75	100
2	V	U23CSX502	Cryptography	PC	3	1	0	4	25	75	100
3	VI	U23CSX603	Malware Analysis and Reverse Engineering	PC	3	1	0	4	25	75	100
4	VII	U23CSX704	Security Incident and Response Management	PC	3	1	0	4	25	75	100
5	VIII	U23CSX805	Artificial Intelligence for Cyber Security	PC	3	1	0	4	25	75	100
			Total					20	125	375	500
			Equivalent NPT	EL courses	##						×
1				,							
	IV	U23CSXN01	Cyber Security Equivalent NPTEL courses	3						2 WEE Course	7. 177X
9	to VIII								=		

## The student shall be given an option to earn 3 credits through one 12 week NPTEL course (equivalent) instead of any one course listed for honours degree programme and shall be completed before the commencement of eighth semester. The equivalent courses are subject to change based on its availability as per NPTEL course list.

B.Tech. Computer Science and Engineering

2.A.3.121

Department	Comp	outer Science and Engineering	Progran	nme: <b>B.</b>	Tech.		1481 (8)	L 11	
Semester	II / IV		Course	Catego	ry: <b>ES</b>	Er	nd Semeste	er Exam Ty	oe: <b>TE</b>
Course Code	11230	SX401	Perio	ds/Wee	ek	Credit	Ma	ximum Mar	ks
Course Code			L	Т	Р	С	CAM	ESE	TM
Course Name	Cybe	r Security Essentials	3	1	0	4	25	75	100
		(Common	to All Bra	nches)					
Prerequisite	NIL								
	On co	ompletion of the course, the stud	dents will	be able	e to		,	BT Ma (Highest	Level
	CO1	Explain the basics of cyber security,	cyber-crime	e and cy	ber law.			K	2
Course Outcomes	CO2	Analyze attack vectors and counterm	neasures fo	r various	s cyber th	nreats.		K4	1
Outcomes	CO3	Use scanning techniques and reconr	naissance t	ools to e	extract in	formation fro	m network	K	3
	CO4	Describe different types of intrusion of	detection sy	/stems.				K	2
	CO5	Configure firewalls and intrusion prev	vention sys	tems.				K	3
UNIT - I		luction				Periods:1		***************************************	
Cyber Security – F of Cyber Crime; Cy IT Act – Cybercrim	/bercrimin	nternet – Impact of Internet – CIA Tria als – Classification of Cybercrimes – <i>F</i> nishment.	ad- Reason A Global Pe	for Cybe rspective	er Crime e on Cyb	<ul><li>Need for 0 er Crimes; 0</li></ul>	Cyber Secur Cyber Laws -	ity – History - The Indian	CO1
UNIT - II		ks and Counter Measures				Periods:1	2		
Malicious Software	e – Comm	Threats and Vulnerabilities: Scope of Coon Attack Vectors – Social engineering	Cyber-Attac ng Attack –	ks – Se Wireles	curity Br s Netwo	each – Type rk Attack – \	es of Malicio Veb Applica	us Attacks - tion Attack -	CO2
Attack Tools – Cou		system and Peer to Peer Service				Periods:1	2	1 20	
		aft – Host – Extracting Information from		Extractir	na Inform			ers – Social	T
Engineering Recor – Ping Sweer Tech	nnaissanc nniques –	e; Scanning – Port Scanning – Networ Nmap Command Switches – SYN – S	k Scanning	and Vul	nerability	Scanning -	Scanning N	lethodology	CO3
and OS Finger prin		niques. sion Detection				Periods:1	2		1
UNIT - IV	18/18/19/00/	ction – Network -Based Intrusion De	tection – [	Distribute	ed or Hv			- Intrusion	1
Detection Exchang	ge Format	Honeypots – Example System Snor	rt.						CO4
UNIT - V		sion Prevention				Periods:1			
Firewalls and Intru – Firewall Basing - Products.	sion Prev - Firewall	ention Systems: Need for Firewalls – Location and Configurations – Intrusi	Firewall Ch on Prevent	aracteris	stics and ems – Ex	Access Pol xample Unifi	icy – Types ed Threat M	of Firewalls anagement	CO5
Lecture Periods	:45	Tutorial Periods: 15	Practica	al Perio	ds: 0	•	Γotal Perio	ds:60	
<ol> <li>J. Brooks and</li> <li>Nina Godbole,</li> <li>Wiley Publisher</li> </ol>	Christoph Sunit Bela s, 2011.	tion to Cyber Security Guide to the Wo er Grow, "Cyber security Essentials",1 apure, "Cyber Security: Understanding	st Edition, J	ones & l	Bartlett L	earning Pub.	lishers, 201	8.	Editior
Reference Book		Solomon, "Fundamentals of Information	n Systems	Security	" 4 <sup>th</sup> Fdit	ion. Jones &	Bartlett Lea	rnina Publis	hers.
2021		e Brown, "Computer Security Principle							11010,
<ol> <li>Timothy J. Sh</li> <li>Patrick Engeb</li> <li>Edition, Else</li> </ol>	imeall, Joi retson, "T vier, 2013	nathan Spring, Vincent Nestler ,"Introd he Basics of Hacking and Penetration	duction to 0 Testing: Et	Sybersed hical Ha	curity",2 <sup>nd</sup> cking an	<sup>e</sup> Edition, CF ad Penetratio	C Press, 20 in Testing M	18.	nd
Web References		Chica Columba Lundar Hadror Newley			.,		1		
<ol> <li>https://www.ge</li> <li>www.tutorialsy</li> <li>https://owasp.</li> </ol>	eeksforge ooint.com/ org/www-	project-top-ten/							
4. <a href="https://www.ni">https://www.ni</a> 5. <a href="https://www.ci">https://www.ci</a>									

<sup>\*</sup> TE – Theory Exam, LE – Lab Exam

COs	DO4	200				Prog Outco	ram Spe omes (P	ecific SOs)							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
1	1	1	1	1	1	1	L .	_	6	_	1	1	1	2	
2	1	3	1	3	2		1.6					1	1	2	3
3	2	1	-	-				-	•	-	-	-	2	2	3
3		1	1	1	-	1	-	-	-	-	1	-	2	2	3
4	3	3	2	2	2	1	_	- 1	- 15	III.	V 8 11		2	2	
5	3	2	1	1	1	1		1						2	3
2000	-1-4					1		. 7771		- 1	1	- 1	2	2	3

		Cont	inuous Assess	ment Marks (CA	M)	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	uter Science and Engineering	Progra	mme: <b>B.</b>	Tech.			, , = 10,17	l'an i
Semester	III/V	P JE	Course	Catego	ry: <b>ES</b>	End S	Semester	Exam Typ	e: <b>TE</b>
Course Code	U23C	SY502	Peri	ods/Wee	k	Credit		ximum Ma	rks
Course Code	- 9   20%		L	₁ ¥≅T⊢	P.	C	CAM	ESE	TM
Course Name	Crypt	ography	3	1	0	4	25	75	100
	4	(Common to	All Bran	ches)					
Prerequisite	NIL								
	On co	mpletion of the course, the stud	lents wil	be able	e to			BT Ma (Highes Level)	
Course	CO1	Understand cryptography and its ne	ed to vario	us applic	ations.		. 1	K	1
Outcomes	CO2	Design public and private key crypto	systems					K	2
	CO3	Understand cryptanalysis and imple	ment vario	us crypto	systems			K	3
	CO4	Implement cryptographic algorithms						K	4
	CO5	Analyze different types of attacks on	various c	nyntoevet	eme			K	4
UNIT - I		uction to Security	various c	yptosyst		Periods:12			
Introduction to Secu	rity-Securit	v Goals - Security services(Confidenti	ality. Inten	rity. Auth	enticatio	n, Non-repud	iation, Acce	ess control)	004
<ul> <li>Security Mechanis</li> <li>Notarization, Acces</li> </ul>	ms (Enciphes control)	nerment, Data Integrity, Digital Signature - Security Principles. Introduction ttacks- Cipher Properties (Confusion,	ire, Authein to Cry	ntication I	Exchange	e, Traffic Pad	ding, Routi	ing Control,	00
UNIT - II		ional Cryptography	/		I	Periods:12			***************************************
Traditional Secret K	ev Cipher	s-Substitution Ciphers (mono alphab dern Secret Key Ciphers-Substitution	etic ciphe Box-Perm	rs, poly utation B	alphabet ox-Produ	ic ciphers)-T uct Ciphers.	ranspositio	n Ciphers-	CO
UNIT - III	Data E	Encryption Standard			F	Periods:12			.4
Encryption Standard Authentication Code	(AES) (S (MAC).	S) (Fiestel and Non-Fiestel Ciphers, tructure, Analysis)-Cryptographic Ha	Structure sh Function	of DES, ons- Pro	perties -	Secure Has	h Algorithr	n-Message	COS
UNIT - IV	4	Key Cryptography		504.0		Periods:12		- T	Т
Key Generation, En	cryption, I dellman Ke	C): - Types of PKC –Trapdoor -one way Decryption) - El Gamal Cryptosystem by Exchange Protocol, Man in the Midde Electronic Records	(Discrete	<ul> <li>Logarith</li> </ul>	nm Trapo Hellman	door, Key Ge	eneration,	Encryption,	CO4
Digital Signature:-Si	anina — Ve	erification - Digital signature forgery (	Existential	forgery.	Selective	forgery, Uni	versal forg	ery) - RSA	1
Digital Signature Sc	heme - El	Gamal Signature Scheme - IP Securi dIntruders, Intrusion Detection, Distrib	ty Overvie	ew, IP Se	curity Ar	chitecture, A	uthentication	on Header,	CO
Lecture Periods:		Tutorial Periods: 15	Practic	al Perio	ds: 0	Tot	al Period	s:60	.1
Text Books			1			1			
<ol> <li>Jonathan Katz al</li> <li>Behrouz A. Forol 2010</li> <li>Douglas R. Stins</li> </ol>	uzan and D	Lindellv,"Introduction to Modern Cryp Debdeep Mukhopadhyay, "Cryptograph ography: Theory and Practice", Third ractices", Pearson Education, Fourth I	ny & Netwo	ork Secur RC Press	ity", Sec	ond Edition, T	ata McGra	ıw Hill, New	Delhi
Reference Books									
1. Atul Kahate, "Cryl 2. Bernard Menezes 3. Bruce Schneier, " 4. Thomas Mowbray	otography ,"Network Applied Cr	and Network Security", 2nd Edition, Ta Security and Cryptography-Cengage I yptography: Protocols, Algorthms, and curity: Managing Systems Conducting ography- Theory & Practice", Pearson	₋earning", I SourceC g Testing,	India, 20 ode in C" and Inve	11 , Second	Edition, Johi Intrusions", J	n Wiley and ohn Wiley,	d Sons Inc, 2013	2001.
Web References									
https://www.gee     www.tutorialspo     https://www.gee	int.com/cry	vtography							

:Os			П		Prog	ram O	utcom	es (PO	s)					ram Spe omes (P	
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	1	1	1	1	1	0 _	1 -	1-	-	1	1	1	2	3
2	1	3	1	3	2	-	-	-	-	-	1	-	2	2	3
3	2	1	1	1	-	1	-	-	-	-	1	-	2	2	3
4	3	3	2	2	2	1	11-12	F .		u us	11 🛓		2	2	3
5	3	2	1	1	1	1	-	1	-	-	1	-	2	2	3

_		Cont	inuous Assess	ment Marks (CAN	<b>/</b> I)	End	<b>T</b> 4 1
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	outer Science and Engineering	Progran			······································			
Semester	IV/VI		Course	Catego	ry: <b>ES</b>	End		er Exam Ty	•••••
O	LIOSC	evens	Perio	ds/Wee	ek	Credit	Ma	ximum Ma	··
Course Code	0230	SX603	L	T	Р	С	CAM	ESE	TM
Course Name	Malwa Engine	re Analysis and Reverse ering	3	1	0	4	25	75	100
		(Common	to all bra	nches)					
Prerequisite	NIL							DTM	
	On co	ompletion of the course, the stud						(Highes	
	CO1	Understand the reverse engineering	process, to	ols, and	l typical	malware beha	vior		2
Course	CO2	Explain the basic concepts of binary	numbers a	nd x86 a	architec	ture.		K	(2
Outcomes	CO3	Analyze files and extract useful infor decompilers.					nd	K	(4
	CO4	Explain Windows/Linux emulation ar	nd binary o	ofuscatio	n techr	iques		K	(2
	CO5	Analyze anti-debugging, anti-VM, an						K	(4
UNIT - I	Prepa	aring to Reverse Engineer				Periods:12			
What is Reverse obehaviour: Persist	engineerir	ng- Reverse engineering as a process ware delivery- Software piracy- Paylo	s- Tools- T ad – the ev	he opera	ating sy Tools:	stem environn Autoruns- The	nent-Typica Process	al malware	CO1
explorer.	The I	ow-level Language				Periods:12	2		
UNIT - II	I ne L	sters- Memory addressing: Endianne	ss Basic	instructio	ons- Bi			ow- Stack	
manipulation- Too	ls – builde ld: Installa	er and debugger: Popular assemblers: tion of FASM- Dealing with common e PI libraries- Short list of common- API	MASM- Na rrors when	ASM- F <i>F</i> building-	Dissec	ting the progra	m. After He	Jiiyaebug-	CO2
UNIT - III	Statio	and Dynamic Reversing				Periods:12			
Other information:	PE execu environm Automati	ysis: Static analysis- File types and he utables. Dead listing: IDA (Interactive I nents- Information gathering tools- Dis on tools- Software forensic tools- Auto	Disassemb assembler omated dyn	er)- Ded s- Debug amic an	omplier ggers- [	s: ILSpy – C# Decompilers- N Online service	letwork too sites.	. Dynamic	CO3
UNIT - IV	Sand	boxing and Binary Obfuscation	Techniqu	ies		Periods:12		MIL MDD	1
debugging with Bo data in other men	ochs. Bina nory regio ecutables	Linux under an x86 host- Analysis in any Obfuscation Techniques: Data ass ns- decrypting with x86dbg- Other ob are loaded by the OS- Packers- crypow about an executable in its unpacke	embly on the fuscation to pters- obfu	ne stack- echnique scators-	es- Pack protect	ting and Encry	ption: A qu	ick review	CO4
UNIT - V	Anti-	-analysis Tricks	<u> </u>			Periods:12	2		
Anti-debugging tri Anti-VM tricks- Ar	cks- Debu nti-emulati	ugger information from NtQueryInform on tricks- Anti-dumping tricks. Practications ising Various File Types: Analysis of H ASM- Flare- XXXSWF- JPEXS SWF	ai Reverse TML scripts decompiler	Enginee S- MS Of	fice ma	oro analysis- P	DF file ana	lysis- SWF	CO5
Lecture Periods		Tutorial Periods: 15	Practic	al Peri	ods: 0	7	otal Peri	ods:60	
Text Books									
2 Bruce Dang	Alexandre	ering Reverse Engineering",2 <sup>nd</sup> Edition e Gazet, Elias Bachaalany, "Practical F g: Secrets of Reverse Engineering",2 <sup>r</sup>	keverse ⊨n	gıneerin	g,ı∾⊏	dition, Wiley, 2	2014.		
Reference Boo	ks						DDD D. L.	actions 201	24
1 litonder Na	rula "Impl	ementing Reverse Engineering: The F	≀eal Practio	e of X86	interna	is , i" Edition,	BLR LADII	cations, 202	۵1.

- Jitender Narula, "Implementing Reverse Engineering: The Real Practice of X86 Internals",1st Edition, BPB Publications, 2021
- A. P. David ,"Ghidra Software Reverse Engineering for Beginners: Analyze, identify, and avoid malicious code and potential threats in your networks and systems", 1st Edition, Packt Publications, 2021.

Andrew Case, Jamie Levy, and AAron Walters,"The Art of Memory Forensics: Detecting Malware and Threats in Windows, Linux, and Mac Memory" ,1st Edition, Wiley Publication, 2014.

- Michael Sikorski and Andrew Honig, "Practical Malware Analysis: The Hands-On Guide to Dissecting Malicious Software" ,1st 4. Edition, No Starch press, 2012.
- Justin Seitz ,"Gray Hat Python: Python Programming for Hackers and Reverse Engineers" ,1st Edition, No Starch Press, 2009.

### Web References

- https://www.geeksforgeeks.org/distributed systems
- www.tutorialspoint.com/distributed systems
- 3. www.splunk.com
- https://www.sans.org/cyber-security-courses/malware-analysis-reverse-engineering/
- 5. https://www.cybintsolutions.com/resources/malware-analysis-guide/

COs	13	T			Prog	ram O	utcom	es (PO	s)					ram Spo omes (P	
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	1	1	2	1	2	-	-	1	1	2	2	3
2	3	2	1	1	1	2	1	2	9.1	11-	1	1	2	2	3
3	3	2	1	2	2	2	1	2	-	-	3	3	2	3	3
4	3	2	2	2	3	2	1	2	M per su	19 1 -	3	3	2	3	3
5	3	2	2	2	3	2	1	2	-	-	3	3	2	3	3

		Cont	inuous Assess	ment Marks (CAI	VI)	End	
Assessment	CAT 1	CAT 2	Model Exam	Attendance	Semester Examination (ESE) Marks	Total Marks	
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	uter Science and Engineering	Progran	nme: <b>B.</b>	Tech.				
Semester	IV /VII		Course			End	d Semeste	er Exam	Type:TE
C C	11000	2V704	Perio	ds/Wee	ek	Credit	Ma	ximum N	Vlarks
Course Code		SX704 ·	L	Т	P,	С	CAM	ESE	TM
Course Name	Ann and an opposite and	RITY INCIDENT AND RESPONSE SEMENT	3	1	0	4	25	75	100
	an e seilu	(Common	to All Brai	nches)	-			A	
Prerequisite	Inform	ation security and applied cryptogr	aphy	13 X					
	On co	mpletion of the course, the stud	ents will	be able	e to	-			Mapping est Leve
	CO1	Understanding inevitable incident and	incident c	letection	and cha	racterization			K1
Course Outcomes	CO2	Get an exposure to live data collection	n, Forensid	duplica	tion.				K2
	CO3	Understanding network evidence							K1
	CO4	Analyze the concept of data analysis	n various	file syste	em				K4
	CO5	Gain knowledge on Investigation inclu	ıdina Wind	lows and	Mac Os	S Systems			K4
UNIT - I		uction	iding vviile	iono and	11100 0	Periods:12	<u> </u>	<u>L</u>	
laintenance of Cas athering and revi earing fraud scena	se Notes, ewing pre ario.	n and Characterization: Getting the inv Understanding Investigative Priorities. Eliminary evidence, determining a cou	Discoveri	ng the s	cope of i	ncident: Exan lata loss scer	nining initia nario, Auto	I data,	
UNIT - II	Data (	Collection				Periods:12			
est practices, Live uplication: Forens f Enterprise Assets	data coll sic Image s.	ollection: When to perform live responsection on Microsoft Windows Systems Formats, Traditional duplication, Live	, Live Dat	a Collec	tion on l	Jnix-Based Station	ystems. Fo		CO2
UNIT - III		k Evidence				Periods:12			
etwork Data, Anal	ysis, Colle	for network monitoring, Types for netwect Logs Generated from Network Everlications, Web servers, Database Serv	nts. Enterp						CO3
UNIT - IV	Data A	nalysis			T T	Periods:12		L	
esults. Investigati /indows Registry, (	lysis Met ng Windo Other Arti	hodology: Define Objectives, Know yourself Systems: NTFS and File System facts of Interactive Sessions, Memory	n analysis	, Prefet	ch, Ever	nt logs, Sche istence Mech	duled Tas anisms.		CO4
UNIT - V		igation				Periods:12			
	Data?, W	ems: HFS+ and File System Analysis, here is application data stored?, Gene	ral Investi	gation m	ethods,				CO5
ecture Periods:	45	Tutorial Periods: 15	Practica	l Perio	ds: 0	To	otal Perio	ds:60	
Education 2. Eric. C. Thomps	on,"Cybe	ew Pepe and Kevin Mandia ,"Inciden r Security Incident Response-How to C rity Incident Management: A Compreh	· Contain, Er	adicate,	and Red	cover from Inc	cidents", Ap	ress	
CICICIOC DOORS	nner "Cv	bersecurity Incident Response: How to	Contain,		e, and R	ecover from I	ncidents " \	Nilev. 20	)20

### Web References

- 7. <a href="https://www.coursera.org/cyber-incident response">www.ibm.com/ incident response</a>
  8. <a href="https://www.coursera.org/cyber-incident response">https://www.coursera.org/cyber-incident response</a>
  9. <a href="https://www.crowdstrike.com/cybersecurity-101/incident-response/">https://www.crowdstrike.com/cybersecurity-101/incident-response/</a>

<sup>\*</sup> TE – Theory Exam, LE – Lab Exam

COs					Prog	ram O	utcom	es (PO	s)					ram Spe omes (P	
	PO1	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	, 2	1	154	will	-		5 -A 4E	1	1	1	2	3
2	2	2	3	3	1	-	-	-	-				2	2	3
3	3	3	3	, 2	3	1	-	-	•		1		2	2	3
4	2	3	3	2	3	1	-	-	-	-	-	-	2	2	3
5	3	2	1	1	1	1	=	1	-	-	1	-	2	2	3

		Cont	inuous Assess	ment Marks (CAN	/I)	End	T = 4 = 1
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	uter Science and Engineering	Progran	nme: <b>B.</b>	Tech.	<del>-</del>			
Semester	IV /VIII		Course	Catego	ry: ES		d Semester		
			Perio	ds/Wee	ek	Credit		imum Marl	Ţ······
Course Code	U23C	5X8U5	L	<u> </u>	P	С	CAM	ESE	TM
Course Name	Artificia	al Intelligence for Cyber security	3	1	0	4	25	75	100
		(Common	to all Bran	ches)					
Prerequisite	Artifici	al Intelligence						BT Ma	opina
	On co	mpletion of the course, the stu						(Highest	Level
	CO1	Understand the cyber threats, attack	ks and vuln	erabilitie	s and its	defensive m	echanism		
Course	CO2	Apply various AI techniques to dete						K	
Outcomes	CO3	Analyze malicious web pages and L	JRLs using	heuristic	s and fe	ature extracti	on methods	K	1
		Understand the various applications	of AI to de	tect cyb	er-attack	S.		K	2
	CO4							K	2
	CO5	Understand mail server to detect sp				Periods:1	2		
UNIT - I		amentals of Al  I Solves – Why Al in Cyber security –	Current Cy	ber Sec	urity Solu	itions - Struct	ured data, U	Instructured	CO1
ntroduction – Probl data – Supervised I	ems that A earning – l	l Solves – Why AI in Cyber security – Jnsupervised learning – Reinforceme	ent learning	– classi	fication p	oroblem - clus	stering probl	ems – Svivi	
– ANNs.						Periods:1		- N - N - 1 - 1 - 1	
UNIT - II		d DDoS  eries – Time Series analysis in Cyber	Security -	Detection	a DDOS	with Time Se	eries – Predi	cting DDOS	T
Time series – Type	s of Time s	eries – Time Series analysis in Cyber es for Cyber security – Types of En	sembles -	Types of	f Ensem	ble Algorithm	ns – Bagging	g, Boosting,	CO2
attacks – Ensemble Stacking, Bavesian	Model - Fr	semple Melitod to detect Oyber atta	O11.			Periods:1			
					LIDLA			ct Malicious	
URL Blacklisting -	Drive by d	ownload URL- Command and Contro - Feature Extraction – Lexical Featu	ol URLS — ıres — Web	Phisning Content	based F	eatures – Ho	st based fea	atures – site	COS
Pages - Data for the	ne analysis	- Feature Extraction - Lexical Feature	1163 - 1165	Conton			2		
Popularity features		Detection and Malicious Event	t Detectio	n		Periods:1	2		
UNIT - IV					CAPTC	HA - Solving	CAPTCHA	with neura	COA
Using Al to crack	Learning i	Types of CAPTCHAS – ReCAPT     Scan Detection - Machine-Learning     Pagagamyara – Rootkit – Spyy	g Application	ons in So	can Dete	ction. Contex	t based Mai – Malicious	Injections in	1 004
detection - Adward	e – Bots –E	n Scan Detection - Machine-Learning Bugs – Ransomware – Rootkit – Spyv	ware – Troj	an norse	s – viius	ses – vvoiilis	- Manoroac		
Wireless networks.						Periods:	12		
UNIT - V		,	ayes theore	m to det	ect span	– Laplace si	moothing – F	eaturization	r CO
Techniques to cov	ert text-bas	Collection from mail server – Naive Ba sed emails to numeric values – Logis	stic regress	ion to sp	oam filter	s - Anomaly	detection te	Chiliques io	1 00.
SMTP and HTTP.			Pract				Total Peri	ods:60	
Lecture Periods		Tutorial Periods: 15	<u>I</u>			<u></u>			
Text Books		Ozdemir ,"Hands-On Machine Lear	nina for Cv	ber Secu	urity: Safe	eguard your s	system by m	aking your r	nachin
1. Soma Ha	rder, Sinan	e python ecosystem", 2 <sup>nd</sup> Edition, Pac	ckt Publishi	ng Ltd, 2	2023.				
2 Al-Sakih	Khan Patha	e python ecosystem", 2 <sup>nd</sup> Edition, Pac an ,"The state of the Art in Intrusion D	etection S	/stem", 2	end Edition	n, CRC Press	s, 2018 C Proce 20	11	
3. Sumeet D	Dua and Xia	an ,"The state of the Art in Intrusion L an Du , "Data Mining and Machine Le	arning in C	yber Sec	curity", 2	Edition, CK	C Press, 20	11.	
Reference Book	(S	n and E litter	- Miles 2	122					
1. Brian Und	derdahl ,"C	ybersecurity for Dummies",2 <sup>nd</sup> Editior me, Quentin Bernhard, and Dorothée	i, vviiey, 20	Artificial	Intelligen	ce for Cybers	security: A C	omprehens	ve
2. Anne-Lau	ure Joussel	me, Quentin Bernnard, and Dorothee	, Lunano, 1						
Guido" 18	- Haitian V	VIIEV PUDIICALION, 2021.		100 72		O : D.	bligation 20	ואכיו	

## 2, 2.3.131

Leslie F. Sikos, "Artificial Intelligence in Cybersecurity: Risk Management", 1st Edition, Springer Publication, 2020.

S. S. Rajput, Suman Bhattacharya, and Sushil Kumar Sharma, "Deep Learning for Cybersecurity", 1st Edition, CRC Press, 2019.

S. S. Rajput, Suman Bhattacharya, and Sushil Kumar Sharma, "Deep Learning for Cybersecurity", 2nd Edition, Mcgraw Hill Education, 2011.

Behrouz A. Forouzan, Debdeep Mukhopadhyay, "Cryptography and Network security", 2nd Edition, Mcgraw Hill Education, 2011.

Guide",1st Edition, Wiley Publication, 2021.

### Web References

- 1. https://www.geeksforgeeks.org/AI for cybersecurity
- 2. www.tutorialspoint.com/cybersecurity
- 3. www.tutorialspoint.com/Al
- 4. https://ieeexplore.ieee.org/Xplore/home.jsp
- 5. https://www.wiley.com/en-us/Artificial+Intelligence+for+Cybersecurity%3A+A+Comprehensive+Guide-p-9781119770031

### COs/POs/PSOs Mapping

COs	T		or E		Prog	ram O	utcom	es (PO	s)					ram Spe	
11	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	1	1	2	1	2		-	1	1	2	- 2	3
2	3	2	1	1	1	2	- 1	2	-	-	1	1	2	2	3
3	3	2	1	2	2	2	1	2	-		3	3	2	3	3
4	3	2	2	2	3	2	1	2	-	-	3	3	2	3	3
5	3	2	2	2	3	2	1	2	-	-	3	3	2	3	3

		Cont	inuous Assess	ment Marks (CA	M)	End	17
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

# **ANNEXURE-III**

(List of Examiners)

2. n. 3. 134 881 . 4. 6.

4 ...



# SRI WANAKULA VINAYAGAR ENGINEERING COLLEGE

# (An Autonomous Institution) Puducherry - 605 107

# Panel of Examiners for Valuation of End Semester Examinations Nov-Dec 2024 Department of Computer Science and Engineering

SMVEC/ Dept/ Exam-Cell/Valuation/2024-2025/0051

Date:25.07.2024

6 Years	Contact No:9629308990	Department of Computing	Learning	Dr.G.Balamurugan	Ŋ
15 Years	E-Mail ID: senthilt2@srmist.edu.in Contact No:9787565565	Associate Professor/ CSE, SRM Institute of Science and Technology Chennai	DBMS, Computer Graphics	Dr T SENTHIL KUMAR	4
16 Years	E-Mail ID:nmanjunathan@veltech.edu.in Contact No:9791060024	Associate Professor / CSE, Vel Tech Rangarajan Dr. Sagunthala R & D institute of Science and Tecnology, Chennai	DBMS, Data Structures	Dr. N. Manjunathan	ω
17 Years	E-Mail ID:thamizharasans@rgcetpdy.ac.in, Contact No:9500211888	Assistant Professor / CSE RGCET, Puducherry.	Design and Analysis of Algorithms, Artificial Intelligence	Dr. S. Thamizharasan	2
15Years	E-Mail ID:arunraj@crescent.education Contact No:9941169805	Associate Professor Department of Computer Science and Engineering B.S. AbdurRahman Crescent Institute of Science and Technology   Vandalur   Chennai-48	Wireless Networks, Theory of Computation, Multimedia Applications, Python	Dr. L.Arun raj	_
		External Examiners			
Experience	Contact number and mail id	Designation, Department and Institution in which currently working	Specialization	Name of the Examiner	SI.No

126
76
3
•
,

	15 Years	18 Years	18 Years	18 Years	15 Years	18 Years
	E-Mail ID:kisorekumar@veltech.edu.in Contact No:9092330191	E-Mail ID:12charuka17@gmail.com Contact No:9487379388	Contact No:9865032026 E-Mail ID:Sathiya.sep05@gmail.com	Contact No:9489229350 E-Mail ID:abarnakt@gmail.com	Contact No: 9894122253 E-Mail ID: psvasanucev@gmail.com	Email ID: senthilucepkt@gmail.com Contact No :8838497277
Technologies SRM Institute of Science and Technology Kattankulathur Campus Chengalpattu-603203	Assistant Professor / CSE, Vel Tech Rangarajan Dr. Sagunthala R & D institute of Science and Tecnology, Chennai	Associate Professor Dept. of CSE Annamalai University	Associate Professor Dept. of CSE Annamalai University	Associate Professor Dept. of CSE Annamalai University	HOD / Assistant professor (SR), Anna university college of engineering, Villupuram	Associate Professor Department of Computer Science and Engineering University College of Engineering Pattukottai
	DBMS, Data Structures	Wireless communication Networks, Network Security	Artificial Intelligence, Operating Systems, Programming in	Design and Analysis of Algorithms, Artificial Intelligence	Design and Analysis of Algorithm Java Programming	Data Science Object oriented Analysis
	Dr. KISHORE KUMAR K	Dr. A.PUNITHA	Dr. S. SATHIYA	Dr. K. T. MEENAABARNA	Dr. P. Seenuvasan	DR.S.SENTHILKUMAR
0	9	7	ω	O	10	<del></del>

		T	Ι		T				
<u> </u>		N			_		4	3	12
Dr. M.SHANMUGAM		Dr. T. MEGALA	Dr. M. GANESAN		Dr. K. Premkumar	7	Dr. N. Sivakumar	Dr. K. Selvakumar	Dr S. Sivanesh
Microprocessors and Microcontrollers Artificial Intelligence		Database Management	Software Engineering, loT, Deep Learning		Data Structures, Object Oriented Programming, Mobile Computing		Python Programming Artificial Intelligence	Design and Analysis of Algorithm Java Programming	Data Structures Python Programming
Assistant Professor, CSE, Sri ManakulaVinayagar Engineering College, Puducherry	Internal Valuators	Assistant Professor, CSE, Sri ManakulaVinayagar Engineering	Associate Professor, CSE, Sri ManakulaVinayagar Engineering College, Puducherry	Chief Examiners	Professor and Head /CSE, Sri ManakulaVinayagar Engineering College,	Board Chairman	Professor / CSE Pondicherry Technological University	Professor and Head./CSE, Annamalai University	Assistant Professor Department of Computer Science and Engineering University College of Engineering, Panruti
9444370963 shanmugam.mm@smvec.ac.in		E-Mail ID: megalacse@smvec.ac.in Contact No:9789722271	Email ID:ganesan@smvec.ac.in Contact No:9486341535		Email ID: hodcse@smvec.ac.in Contact No.: 9842127679		Email ID: sivakumar@ptuniv.edu.in Contact No : 9840901054	Email ID: kskaucse@gmail.com Contact No: 9443185363	Email ID: sivanesh.s@gmail.com Contact No : 95788 99988
15 Years	a	8 Years	15 Years	7	23 Years		18 years	25 years	16 Years

00
3
n
•
4
જ

		e <sup>re</sup> e	
14 Years	12 Years	12 Years	10 Years
E-Mail ID: mails2karthy@gmail.com Contact No:9791553404	E-Mail ID:thiyagarajan@smvec.ac.in Contact No:9791857984	E-Mail ID: successraju06@gmail.com Contact No:9600551422	E-Mail ID: deepa.cse@smvec.ac.in Contact No::6380 547 250
Assistant Professor, CSE, Sri ManakulaVinayagar Engineering College, Puducherry	Assistant Professor, CSE, Sri ManakulaVinayagar Engineering College, Puducherry	Assistant Professor, CSE, Sri ManakulaVinayagar Engineering College, Puducherry	Assistant Professor, CSE, Sri ManakulaVinayagar Engineering College, Puducherry
DBMS Mobile Computing	Artificial Intelligence, Programming in C	OOPS, Programming in Python	Software Engineering
Mr. P.KARTHIKEYAN	Mr. B. THIYAGARAJAN Intelligence, Programming in C	Mr. D. RAJESH	Mrs. R. DEEPA
2	ю	4	2

HOD/CSE Dr,K. Premkumar

Exan: Çgordinator (Mr.B.Thiyagarajan)



# SRI MANAKULA VINAYAG ENGINEERING COLLEGE IAN AUTONOMOUS INSTITUTIONS



# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING **CSE OFFERING COMMON COURSES**

SL.NO	Offering	Course Code	Course Name	CSE	Remark
1	CSE	U23CSTC01	Programming in C	11/1,1/11	COMMON TO ALL EXCEPT(CSBS and FT)
2	CSE	U23CSTC02	Problem Solving Approach	I/I	COMMON TO CSE, CCE and ICE
3	CSE	U23CSPC01	Programming in C Laboratory	1/1,1/11	COMMON TO ALL EXCEPT(CSBS and FT)
4	CSE	U23CSTC03	Data Structures	I/II, II/III	COMMON TO ALL EXCEPT(CSBS and FT)
5	CSE	U23CSPC02	Data Structures Laboratory	I/II, II/III	COMMON TO ALL EXCEPT(CSBS and FT)
6	CSE	U23CSBC01	Design and Analysis of Algorithms	III/III	COMMON TO CSE and AI&DS
7	CSE	U23CSDC01	Automata and Compiler Design	III/III	COMMON TO CSE and AI&DS
8	CSE	U23CSTC04	Database Management Systems	AI/II	COMMON TO CSE, IT and CCE
9	CSE	U23CSTC05	Operating Systems	VI/II	COMMON TO CSE and IT
10	CSE	U23CSPC03	Database Management Systems Laboratory	VI/II	COMMON TO CSE, IT and CCE
11	CSE	U23CSPC04	Operating Systems Laboratory	VI/II	COMMON TO CSE and IT
12	CSE	U23CSTC06	Artificial Intelligence	V/III	COMMON TO CSE, IT and CCE
13	CSE	U23CSPC05	Artificial Intelligence Laboratory	$\Lambda/\Pi$	COMMON TO CSE, IT and CCE
14	CSE	U23CSTC07	Web Designing	$\Lambda/III$	COMMON TO CSE and AI&DS
15	CSE	U23CSPC06	Web Designing Laboratory	V/III	COMMON TO CSE and AI&DS
			ELECTIVES		
16	CSE	U23CSEC02	Introduction to Industry 4.0	IIIA/AI	COMMON TO CSE and MECHTRONICS

Curriculum Cordinator (Mr. P. Karthikeyan)

HOD

(Dr. K. Premkumar)

Department	Comp	uter Science and Engineering	Program								
Semester	1/11		Course				nd Semeste				
Course Code	U23C	STC01	Perio	ds/Wee		Credit		ximum Mar	7		
Course Code	0230.	31001	L	Т	Р	С	CAM	ESE	TM		
Course Name	Progr	amming in C	3	0	(0)	<b>3</b>	25	75	100		
		(Common to All Bran	ches Exce	pt CSB	S and F	T) /					
Prerequisite	NIL							DT M-			
	On co	mpletion of the course, the stu	dents will	be able	e to			BT Ma (Highes	Level		
	CO1	Comprehend the basics of Computer	<b>s</b> . հեր	e s also f				K			
Course	CO2	Illustrate the concepts of control stru	ctures and I	ooping.				K	2		
Outcomes	CO3	Implement programs using arrays ar	nd functions					K	3		
	CO4	Demonstrate programs using Structu						K	3		
	CO5	Build the programs using Union and			peration	ns.		K	3		
UNIT - I		luction	1 no manag		Politica	Periods:	09	I			
Seperation and C	lassificati	on of Computers - Block Diagram	of a Compu	iter –Ca	tegories	of Softwar	e – Networ	k Structure	CO1		
lumber System –	Binary - I	Decimal – Conversion – Algorithm – F	Pseudo code	e – Flow	Chart.	***************************************					
UNIT - II	C Pro	C Programming Basics  Programming – Basic structure of a 'C' program – compilation and linking processes – Constants,									
lata Types - Exp	ressions	ning – Basic structure of a 'C' progran using operators in 'C' – Managing Ir	n – compilati iput and Ou	tput ope	iinking p erations	– Decision	Making and	Branching -	CO2		
ooping statement	S. Arrav	s and Functions				Periods:	09				
rrava Initializati	on Dock	eration – One dimensional and Two di	mensional a	rrays. St	tring- St	ring operation	ns – String A	rrays. Simp	e		
rograms- sorting- y reference – Re	searching	g – matrix operations- Function – defi	nition of fun	ction – D	eclarati	on of functio	n – Pass by	value – Pas	s CO3		
UNIT - IV	Struc	ture and Pointers				Periods:					
ointers - Definition	tion – St n – Initial	ructure definition – Structure declara zation – Pointers arithmetic – Pointer	ation – Stru s and array	cture w	ithin a s er to Fur	structure –S nction –Poin	self Referent ter and Struc	ial Structure cture- Simple	CO4		
rograms.	Unio	ns and Files				Periods:	09				
UNIT - V	Decares	as Using Structures and Unions - Intr	oduction to	File - File	e Opera	tions - File I	nput and Out	put Function	ıs		
THOU HILLOUGCHOL	- Flograi	is osling offactares and officire		mente-	Storage	Classes -	Pre-Process	or Directive	s- CO5		
Random Access	to Files	- File System Functions - Comman	d Line Argu	iiiiciits-	Otorago						
Random Access  Oynamic Memory	to Files Functions	- File System Functions - Comman	Practic				Total Peri				
Random Access Dynamic Memory Lecture Periods	to Files Functions	- File System Functions - Comman	d Line Argu								
Random Access )ynamic Memory _ecture Periods Fext Books  Balagurusamy	to Files Functions 3:45 E. "Progr	- File System Functions - Comman  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi	Practic    Rigi	al Perio							
Random Access ynamic Memory ecture Periods Fext Books Balagurusamy	to Files Functions <b>5:45</b> E, "Progr	- File System Functions - Comman  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi	Practic    Practic	<b>al Perio</b> ,2019.							
Random Access Dynamic Memory Lecture Periods Fext Books Balagurusamy Yashvant Kan Herbert Schild	E to Files Functions Functions E, "Progretkar, "Lett," C: The	- File System Functions - Comman  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi	Practic    Practic	<b>al Perio</b> ,2019.							
Random Access Dynamic Memory Lecture Periods Fext Books Balagurusamy Yashvant Kan Herbert Schild Reference Bool	E, "Progretkar, "Let t," C: The	- File System Functions - Comman  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi us C", BPB Publications, 16th Edition Complete Reference", McGraw Hill, F	Practic   Practic     Practic	,2019. ,2014. Shan Aug	ods: - g-2019.						
Random Access Dynamic Memory Lecture Periods  Fext Books Balagurusamy Yashvant Kan Herbert Schild Reference Bool Vikas B. Agai Ashok N Kam	E, "Progretkar, "Le' t," C: The  (S) wal Jyoti	- File System Functions - Comman  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi us C", BPB Publications, 16th Edition Complete Reference", McGraw Hill, F	Practic    Practic   Ring   Practic   Practic   Practic	al Perio ,2019. 1,2014. Shan Aug	ods: - g-2019.						
Random Access Dynamic Memory Lecture Periods Fext Books Balagurusamy Yashvant Kan Herbert Schild Reference Bool Vikas B. Agai Ashok N Kam	E, "Progretkar, "Let t," C: The wal Jyoti	- File System Functions - Comman  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi tus C", BPB Publications, 16th Edition Complete Reference", McGraw Hill, F  P. Mirani, "Computer Fundamentals, I omputer Programming", Pearson edu	Practic    Practic   II, 8thEdition   2017.   FourthEdition   Virali Prakas   cation, Second Edition 2	al Perio ,2019. n,2014. Shan Aug and Impr	p-2019. ession,2	2012.	Total Peri	ods:45	lication		
Random Access Dynamic Memory Lecture Periods Fext Books Balagurusamy Yashvant Kan Herbert Schild Reference Bool Vikas B. Agai Ashok N Kam Vikas Verma, P. Visu, R.Sri	E, "Progretkar, "Lett," C: The  (S)  wal Jyoti Ithane, "C "A Workb, nivasan a	- File System Functions - Comman  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi tus C", BPB Publications, 16th Edition Complete Reference", McGraw Hill, F  P. Mirani, "Computer Fundamentals, I computer Programming", Pearson edu cook on C ", Cengage Learning, Second S. Koteeswaran, "Fundamentals of	Practic    Practic     Practic       Practic       Practic       Practic       Practic       Practic       Practic       Practic     Practic     Practic     Practic     Practic     Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic	al Perio ,2019. n,2014. shan Aug ond Impr 012. g and Pro	g-2019. ession,2	2012. ing", Fourth	Total Peri	ods:45	lications		
Random Access Dynamic Memory Lecture Periods Fext Books Balagurusamy Yashvant Kan Herbert Schild Reference Bool Vikas B. Agai Ashok N Kam Vikas Verma, P. Visu, R.Sri	E, "Progretkar, "Lett," C: The  (S)  wal Jyoti Ithane, "C "A Workb, nivasan a	- File System Functions - Comman  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi tus C", BPB Publications, 16th Edition Complete Reference", McGraw Hill, F  P. Mirani, "Computer Fundamentals, I omputer Programming", Pearson edu	Practic    Practic     Practic       Practic       Practic       Practic       Practic       Practic       Practic       Practic     Practic     Practic     Practic     Practic     Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic	al Perio ,2019. n,2014. shan Aug ond Impr 012. g and Pro	g-2019. ession,2	2012. ing", Fourth	Total Peri	ods:45	lications		
Random Access ynamic Memory ecture Periods  Fext Books  Balagurusamy 2. Yashvant Kan 3. Herbert Schild Reference Bool 1. Vikas B. Agai 2. Ashok N Kam 3. Vikas Verma, 4. P. Visu, R.Sri 2012. 5. PradipDev, M Web Reference	E, "Progretkar, "Left," C: The CS wal Jyoti I thane, "C "A Workb nivasan a	Tutorial Periods: -  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi as C", BPB Publications, 16th Edition Complete Reference", McGraw Hill, F  P. Mirani, "Computer Fundamentals, I computer Programming", Pearson edu cook on C ", Cengage Learning, Second S. Koteeswaran, "Fundamentals of cush, "Programming in C", Second Edi	Practic    Practic     Practic       Practic       Practic       Practic       Practic       Practic       Practic       Practic     Practic     Practic     Practic     Practic     Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic   Practic	al Perio ,2019. n,2014. shan Aug ond Impr 012. g and Pro	g-2019. ession,2	2012. ing", Fourth	Total Peri	ods:45	lications		
Random Access Dynamic Memory Lecture Periods Fext Books Balagurusamy Yashvant Kan Herbert Schild Reference Bool Vikas B. Agai Ashok N Kam Vikas Verma, P. Visu, R.Sri 2012. PradipDev, M Neb Reference	E, "Progretkar, "Lett," C: The Swal Jyoti Ithane, "C "A Workb nivasan a lanasGho s	- File System Functions - Comman  Tutorial Periods: -  amming in ANSI C", Tata McGraw Hi tus C", BPB Publications, 16th Edition Complete Reference", McGraw Hill, F  P. Mirani, "Computer Fundamentals, I computer Programming", Pearson edu cook on C ", Cengage Learning, Second S. Koteeswaran, "Fundamentals of	Practic    Practic   Practic   II, 8thEdition n, 2017.   FourthEdition   Prakase   Cation, Second Edition, 2016   Fomputing   tion, Oxford	al Perio ,2019. n,2014. shan Aug ond Impr 012. g and Pro	g-2019. ession,2	2012. ing", Fourth	Total Peri	ods:45	lications		

- nttps://www.geekstorgeeks.org/c-language-set-1-introduction/
   https://www.tutorialspoint.com/cprogramming
   https://www.assignment2do.wordpress.com/.../solution-programming-in-ansi-c
   https://nptel.ac.in/courses/106/104/106104128/

B.Tech. Computer Science and Engineering

<sup>\*</sup> TE – Theory Exam, LE – Lab Exam

COs	7 .	T.	Jed. v	a pod	Prog	ram O	utcom	es (PO	s)				Prog Outco	ram Spo omes (P	ecific (SOs)
auder-	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12		PSO2	
1	2	1	-	-	3	70.	- 01	_	-	-	-	= - (	3	in. o-odl	3
2	2	1	-	-	3	-		-	-	-			3	_	3
3	3	2	1	1	3	-	-	_	-	-	_	1 T	3		3
4	3	2	1	1	3	-	-	_	_	_	_	_	3	_	3
5	3	2	1	1	3	-	-	-	-	-	-		3	ELA 21	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Methods**

		Cont	tinuous Assess	ment Marks (CA	M)	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

B.Tech. Computer Science and Engineering

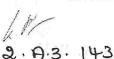
2.0.3. 142

Department	Computer Science a	nd Engineering	Program	me: <b>B.</b> 7	Гесh.				
Semester	1/11		Course	Categor	y: <b>ES</b>	End		er Exam T	
)emester			Perio	ds/Wee	k	Credit	Ma	ximum Ma	
Course Code	U23CSPC01		L	T	Р	С	CAM	ESE	TM
Course Name	Programming in C La		0	0	2	1 -	50	50	100
	(Co	ommon to All Brand	ches Exce	pt CSB	S and F	Γ)			
Prerequisite	NIL					17			
	On completion of the							(Highe	apping st Leve
	CO1 Implement logical	formulations to solve	simple pro	blems le	eading to	specific appl	ications.		₹3
Course	CO2 Execute C program	ns for simple applica	tions makir	ig use of	f basic co	nstructs, arr	ays and		<b>K</b> 3
Outcomes	CO3 Experiment C prog	grams involving funct	tions, recur	sion, poi	nters, an	d structures.		M Lane 4	K3
	CO4 Demonstrate appl							1	K3
	CO5 Build solutions for				12 - 11 -	San air Sa	1101199		K3
	CO3 Dalla solutione lei		of Exercis	es					
5. Demonst 6. Find the 7. Write a C 8. Write a C 9. Develop 10. Construct 11. Impleme 12. Write a C 13. Develop 14. Write a C 15. Write a C 16. Construct 17. Write a C	program to Print the numb rate do—While loop in C to factorial of a given number program to check whether a C program to swap two not a C program to find the son matrix multiplication using program to find the sum of program to find the sum of program to find the sum of program to find the Maximat a C program to display Er program to display the confile by getting the input from program to create two files.	find the sum of 'n' ni using Functions in C a given string is palit a value is prime or rumbers using call by nallest and largest el g C program. It is string handling funcharacters in a string fan integer array using the medium element in an intents of a file on the at the keyboard and res with a set of values	umbers ndrome or not? value and ement in ar ctions like s except alp ng pointers teger array g Structures monitor sc etrieve the c s. Merge the	not? call by real array. ctrlen, strhabets. using poreen. contents	eference.  rcpy, strc.  inters.	at, strcmp.	peration co	ommands.	
20. Write a C	program to pass the parar	neter using comman	d line argur	Herita.			Total Per	iods:30	<u>l</u>
ecture Period	J	al Periods: -	Fractio	airen	Jus.30	L	. Juli Vi		
(Like C) 2. Anita Go 3. Mauree	Shaw," Learn C the Hard ', Addison Wesley,2016. bel and Ajay Mittal," Compu n Sprankle, Jim Hubbard," F nth Kanethkar, "Let us C", E rnighan and D.M. Ritchie, "	ter Fundamentals an Problem Solving and	d programmi Programmi	ning in C ng Cond	o", Pearse cepts," Pe	on Educatior earson, 9 <sup>th</sup> Ed	n, First edit dition, 2011	ion, 2011.	
ved Kelerence	ison.com/course/introductio	n-to-c-programming							
2. https://w	ison.com/course/introduction ww.geeksforgeeks.org/c-prod- d-lab.github.io/cadlab_data/ ww.tenouk.com/clabworksh	ogramming-language files/1993_prog_in_c	.pdf						

https://fresh2refresh.com/c-programming/ Theory Exam, LE - Lab Exam

https://www.tenouk.com/clabworksheet/clabworksheet.html

B.Tech. Computer Science and Engineering



COs	Program Outcomes (POs)										Program Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12		PSO2	
1	2	1		-	3	- 2	1 2		_	- 1/s	-ltr	1750	3 .	mend	3
2	2	1	-		3		in en	1.44	4		_		3	Bott	2
3	3	2	1	1	3	_	_	- /			A CHILITATE		3		3
4	3	2	1	1	3	_	_	_	_		_	-	3	, IFI	3
5	3	2	1	1	3	103	oka u u	T tilve -	h roles	a sale q	<del>- 1 - 3 - 4</del>	<del></del>	3		3
				1	3	-	-			-	-	-	3	-	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

**Evaluation Methods** 

	C	ontinuous	I was a way on the	<u> </u>			
Assessment	Performand cla	ce in practi sses	cal	Model		End Semester	Total
	Conduction of practical	Record work	viva	Practical Examination	Attendance	Examination (ESE) Marks	Marks
Marks	15	5	5	15	10	50	100

B.Tech. Computer Science and Engineering

2. A-3. 144

Department	Comp	uter Science and Engineering	Progran							
Semester	ı demi	T-071	Course	Catego	ry: I	PC	*End	Semeste	r Exam Ty	pe: <b>TE</b>
Course Code	U23C5	STC02	Perio	ds/Wee	ek		Credit	Maxin	num Marks	
Ocurse Code	J J J J J J J J J J J J J J J J J J J		L	T		P	С	CAM	ESE	TM
Course Name	Proble	em Solving Approach	3	0	(	0	3	25	75	100
	1 = =	(Common to	CSE, ICE	and CC	E)	i i			<u> </u>	
Prerequisite	NIL							7		
	After	completion of the course, the st	udents w	ill be al	ole	to	я		BT M (Highe	apping st Leve
_	CO1	Explain the basic concepts of comp	outational th	ninking a	nd p	oroblem	solving.		2.160	(2
Course Outcomes	CO2	Explain basic concepts of algorithm	n and data	organiza	tion.	•				(2
Outcomes	CO3	Illustrate algorithmic solution to pro	blem solvin	g.					P	(3
	CO4	Explain the concepts of array, merg	ging, sorting	g & searc	ching	g.			P	(2
	CO5	Implement recursive algorithm to so	olve problei	ms.		9/1			P	(3
UNIT-I		utational Thinking and Logic-So	olving Pro	blems			Periods	:9	L	
	nking – Info	ormation and Data – Converting Infor nits of Computation – Pseudocode ar	mation into	Data – I	Data	a Capac	ity – Data 1	Types and	d Encoding -	- CO1
UNIT-II	Algori	thmic Thinking and Data Organ	ization				Periods	:9		
		hms – Software and Programming		s – Acti	ons.	. Data	Organizatio	n: Name	list, Graph	1
lierarchies – Spre	ad Sheets	- Text processing - Patterns - Pseu	idocode an	d Flow C	har	t.				CO2
										001
UNIT-III		mental Algorithms and Factorii	_				Periods			L
undamental Algor ase Conversion –	rithms: Exc - Characte	mental Algorithms and Factoring hanging – Counting – Summing – Farto number conversion. Factorial Meedudocode and Flow Chart.	ctorial Con	putation			i Sequence	e – Rever		it-
undamental Algor ase Conversion –	rithms: Exc - Characte actor – Pse	changing – Counting – Summing – Fa r to number conversion. Factorial Me	ctorial Com thods: Find	putation			i Sequence	e – Rever		it-
Fundamental Algor Base Conversion – Number – Prime Fa UNIT-IV Array Techniques: Removal of Duplica Linear, Binary – Ps	ithms: Exc - Characte actor – Pso Array, Introduction ate – Partite eudocode	changing – Counting – Summing – Far to number conversion. Factorial Me eudocode and Flow Chart.  Merging, Sorting and Searching on – Array order reversal – Array Coloning – Longest monotone. Sorting a and Flow Chart.	ctorial Com thods: Find g ounting or and searchi	nputation ling Squa Histogra ng: Sorti	mmi	Root – ( ing – M by Bubbl	Periods aximum ar e, Selectio	e – Rever ommon D ::9 nd Minimu n, Insertic	ivisor – Prin um of a Set	it- ne CO3
Fundamental Algor Base Conversion – Number – Prime Fa UNIT-IV Array Techniques: Removal of Duplica Linear, Binary – Ps UNIT-V	ithms: Exc Characte actor – Pse Array, Introduction ate – Partit ceudocode Text P	changing – Counting – Summing – Far to number conversion. Factorial Me eudocode and Flow Chart.  Merging, Sorting and Searching on – Array order reversal – Array Coloning – Longest monotone. Sorting a and Flow Chart.  rocessing, Pattern Searching a	ctorial Com thods: Find g ounting or and searchi	nputation ling Squa Histogra ng: Sorti	mmi ng b	Root – ( ing – M by Bubbl ithms	Periods Periods A Selection	e – Rever ommon D ::9 nd Minimu n, Insertic	ivisor – Prin um of a Set on. Searchin	it- ne CO3
Fundamental Algor Base Conversion – Number – Prime Fa UNIT-IV Array Techniques: Removal of Duplica Linear, Binary – Ps UNIT-V Key word Searchin	ithms: Exc Characte actor – Pse Array, Introduction ate – Partit seudocode Text P	changing – Counting – Summing – Far to number conversion. Factorial Me eudocode and Flow Chart.  Merging, Sorting and Searching on – Array order reversal – Array Coloning – Longest monotone. Sorting a and Flow Chart.	ctorial Com thods: Find gounting or and searchi nd Recurs	nputation ing Squa Histogra ng: Sorti sive Alç inear Pa	mmi ng b	ing – M by Bubbl ithms n Searci	Periods aximum ar e, Selection Periods n. Recursion	e – Rever ommon D ::9 nd Minimu n, Insertic	ivisor – Prin um of a Set on. Searchin	g CO4
Fundamental Algor Base Conversion – Number – Prime Fa UNIT-IV Array Techniques: Removal of Duplica Linear, Binary – Ps UNIT-V Key word Searchin	ithms: Exc Characte actor – Pse Array, Introduction ate – Partitiseudocode Text P g – Text L n – Combin	changing – Counting – Summing – Far to number conversion. Factorial Me eudocode and Flow Chart.  Merging, Sorting and Searching on – Array order reversal – Array Coloning – Longest monotone. Sorting a and Flow Chart.  rocessing, Pattern Searching a line Adjustment – Linear Pattern Sear	ctorial Com thods: Find gounting or and searchi nd Recurs	Histograng: Sorting Squang: Sorting: Sorting Sive Alçinear Parseudocc	mming b	ing – M by Bubbl i <b>thms</b> n Searcl and Flow	Periods aximum ar e, Selection Periods n. Recursion W Chart.	e – Rever ommon D ::9 nd Minimu n, Insertic	um of a Set	it- ne CO3
Fundamental Algor Base Conversion – Number – Prime Fa UNIT-IV Array Techniques: Removal of Duplica Linear, Binary – Ps UNIT-V Key word Searchin Sample Generatior	ithms: Exc Characte actor – Pse Array, Introduction ate – Partitiseudocode Text P g – Text L n – Combin	changing – Counting – Summing – Far to number conversion. Factorial Me eudocode and Flow Chart.  Merging, Sorting and Searching on – Array order reversal – Array Coloning – Longest monotone. Sorting a and Flow Chart.  rocessing, Pattern Searching a ine Adjustment – Linear Pattern Searnation Generation – Permutation Generation	g counting or land searchi ch – Sub Leration – P	Histograng: Sorting Squang: Sorting: Sorting Sive Alçinear Parseudocc	mming b	ing – M by Bubbl i <b>thms</b> n Searcl and Flow	Periods aximum ar e, Selection Periods n. Recursion W Chart.	e – Rever ommon D ::9 nd Minimu n, Insertic ::9 on:Towers	um of a Set	g CO4
Fundamental Algor Base Conversion – Number – Prime Fa UNIT-IV Array Techniques: Removal of Duplica Linear, Binary – Ps UNIT-V Key word Searchin Bample Generatior Lecture Periods Text Books David Riley and	ithms: Exc - Characte actor – Pso Array, Introduction ate – Partition eudocode Text P g – Text L n – Combin s:45	changing – Counting – Summing – Far to number conversion. Factorial Me eudocode and Flow Chart.  Merging, Sorting and Searching on – Array order reversal – Array Coloning – Longest monotone. Sorting a and Flow Chart.  rocessing, Pattern Searching a line Adjustment – Linear Pattern Sear nation Generation – Permutation Generation – Permutation Generation.	ctorial Com thods: Find gounting or and searchi nd Recurs rch – Sub L peration – P	Histograing: Sorting Sorting: Sorting: Particular Parti	mming b	ing – M ing – M by Bubbl ithms n Search and Floor	Periods aximum ar e, Selectio Periods n. Recursio W Chart.	e – Rever ommon D ::9 id Minimu n, Insertic ::9 on:Towers	ivisor – Prinum of a Seton. Searchines of Hanoi–	g: CO4
Fundamental Algor Base Conversion – Number – Prime Fa UNIT-IV Array Techniques: Removal of Duplica Linear, Binary – Ps UNIT-V Key word Searchin Bample Generatior Lecture Periods Fext Books David Riley and Cold. R.G. Dromey, "H S. Vickers Paul, "Ho	ithms: Exc Characte actor – Psc Array, Introduction ate – Partite eudocode Text P g – Text L n – Combin s:45 Kenny Hur	changing – Counting – Summing – Far to number conversion. Factorial Me eudocode and Flow Chart.  Merging, Sorting and Searching on – Array order reversal – Array Coloning – Longest monotone. Sorting a and Flow Chart.  rocessing, Pattern Searching at the Adjustment – Linear Pattern Sear nation Generation – Permutation Gen	g counting or and searching and Recursion – Practica	Histograing: Sorting Squareng: Sortinear Parseudoccal Perio	mming b	ing – M ing – M by Bubbl ithms n Search and Flor	Periods aximum ar e, Selectio Periods n. Recursio W Chart. To	e – Rever ommon D ::9 id Minimu n, Insertic ::9 on:Towers otal Perio	ivisor – Prinum of a Seton. Searchines of Hanoi— ods:45	g: CO4
Fundamental Algor Base Conversion – Number – Prime Fa UNIT-IV Array Techniques: Removal of Duplica Linear, Binary – Ps UNIT-V Key word Searchin Sample Generatior Lecture Periods Lext Books L. David Riley and Lo14. L. R.G. Dromey, "H Reference Books	ithms: Exc Characte actor – Pse Array, Introduction ate – Partit seudocode Text P g – Text L n – Combin s:45  Kenny Hun low to solv ow to Thin s	changing – Counting – Summing – Far to number conversion. Factorial Meleudocode and Flow Chart.  Merging, Sorting and Searching on – Array order reversal – Array Colioning – Longest monotone. Sorting a and Flow Chart.  rocessing, Pattern Searching aline Adjustment – Linear Pattern Searnation Generation – Permutation Feriods: – Permutation – Permutation Generation – Permutation Formation – Permutation Formation – Permutation Formation – Permutation Formation – Permutation – Permutation Formation – Permutation – Permutation Formation – Permutation – Perm	g cunting or and searchi rch – Sub Leration – P Practica rn Problem g for the Be	Histograng: Sorting Squares Alginear Paseudoccal Perio	mming by the state of the state	ing – M ing – M by Bubbl ithms n Searcl and Flor - apman 8	Periods aximum ar e, Selectio Periods n. Recursio W Chart. To	e – Rever ommon D ::9 id Minimu n, Insertic ::9 on:Towers otal Perio	ivisor – Prinum of a Seton. Searchines of Hanoi— ods:45	g: CO4
Fundamental Algor Base Conversion – Number – Prime Fa UNIT-IV Array Techniques: Removal of Duplica- Linear, Binary – Ps UNIT-V Key word Searchin Bample Generation Lecture Periods Fext Books 1. David Riley and 2014. 2. R.G. Dromey, "H 3. Vickers Paul, "H 6. Reference Books 1. Kathryn Rentz, F 2. Don McAdam, R 3. V Anton Spraul, " 4. Sham Tickoo "A	ithms: Exc Characte actor – Psc Array, Introduction ate – Partite eudocode Text P g – Text L n – Combin s:45  Renny Hur bow to solv ow to Thin s Paula Lent oger Winn "Think Like Problem-s	changing – Counting – Summing – Far to number conversion. Factorial Me eudocode and Flow Chart.  Merging, Sorting and Searching on – Array order reversal – Array Coloning – Longest monotone. Sorting a and Flow Chart.  rocessing, Pattern Searching at ine Adjustment – Linear Pattern Sear nation Generation – Permutation Generation – Permutation Generation – Tutorial Periods:  nt, "Computational Thinking for Mode are it by Computer", PHI,2008.	g counting or land searching reh – Sub Liperation – P Practicator Problem Graw-Hill Editive Hall Careative Problem Learning, 20	Histogrames Sorting Solver Para Solver, wildered ducation, anada; 2 blem Solver.	mmming b  gori tterrode : Cha ", C	ing – M by Bubbl ithms n Searcl and Flor : - appman 8 engage 18. Edition, 2	Periods aximum ar e, Selection Periods n. Recursion W Chart. To A Hall/CRC Learning E	e – Reverommon D  ::9  Id Minimum, Insertice ::9  on:Towers  otal Period :Text Bood  EMEA,200	ivisor — Prin  um of a Set on. Searchin  ods:45  oks in Comp  08.	g: CO4

- .. https://www.edx.or g/learn/problem-solving 2. https://www.lynda.com/Business-Skills-tutorials/Problem-Solving-Techniques/553700-2.html 3. https://www.classcentral.com/course/problem-solving-skills-6687

TE - Theory Exam, LE - Lab Exam

B.Tech. Computer Science and Engineering

2. A. 3. Ms

COs	m <sub>g</sub> ) :	afizet	nd Japan	en.	Prog	ram O	utcom	es (PO	s)					ram Spe omes (P	
	PO1	PO2	PO3	PO4	PO5	<b>PO6</b>	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	1	Inc.		1	-	-	-	1	-	J 500.00	1	3	2	3
2	2	1 .	-	-	1	-0	- 3	-	-	-		1	3	2	3
3	2	1	-	-	1	-	-		7 200	-	-	1	3	2	3
4	2	1	-	-	1		-	-	-	-	_	1	3	2	3
5	3	2	1	1	1		491 <u>1</u> 91	High P	micer	s asis =	THEY TO	1	3	2	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Method**

		Continu	ous Ass	essment Marks	(CAM)	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	1	0	5	5	5	75	100

<sup>\*</sup>Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

B.Tech. Computer Science and Engineering

2. A.3. 146

Department	Computer Science and Engineering	Programm	e: B.Ted	h		In		
Semester	IVIII seggi zero reservis	Course C	ategory	: ES	End	d Semester	Exam Type:	TE
Cauraa Cada		Perio	ds/Week		Credit	Max	ximum Marks	3
Course Code	U23CSTC03	· La	acTo	Р	Lean Can	CAM	ESE	TM
Course Name	Data Structures	3	0	0	3	25	75	100
	(Common to All Bra	anches excep	t CSBS	and F1	<u> </u>		-	
Prerequisite	Any Programming Knowledge							
······································	On completion of the course, the students	will be able	to				BT Ma	
	CO1 Compute time and space complexity for	or given prob	ems				K2	2
Course	CO2 Demonstrate stack, queue and its oper						K2	
Outcomes	CO3 Illustrate the various operations of link						K3	
	CO4 Use the concepts of tree for various ap CO5 Outline the various Tables, Graphs an		allee				K3 K3	
UNIT - I	Basic Terminologies of Data Structures		ques.		Periods:09			,
	asic Terminologies - Asymptotic Notations: Co		lvsis A	rrav an		ns - Searc	hing: Linear	1 40,0
Search and Bir	nary Search Techniques. Sorting: Bubble So	ort - Selection	n Sort	– Inser	tion Sort - He	eap Sort -	Shell Sort.	CO1
Performance an UNIT - II	d Comparison among the sorting methods.  Stack and Queue Operations				Periods:09			<u> </u>
	ues: ADT Stack and its operations. Applications	of Stacks: Ex	pression	Conve	1	luation. AD	T Queue	000
and its operatio	ns. Types of Queue: Simple Queue – Circular C	ueue – Prior	ity Que	ue – De	que.		1 12.1	CO2
UNIT - III	Linked List Operations				Periods:09			
Linked Lists: Sir	ngly linked list: Representation in memory. Algori	thms of seve	ral opera	ations:	Traversing - Se	earching - I	nsertion -	coa
	representation of Stack and Queue. Doubly link	ed list: opera	tions. Ci	rcular L		perations.		CO3
UNIT - IV	Trees ee Terminologies. Different types of Trees: Binary	. Tree Three	adad Dir	on, Tr	Periods:09	roh Troo	Dinon	T
Trees: Basic Tree Tree Traversals	ee Terminologies. Different types of Trees: Binary - AVL Tree- Red Black Tree.	y riee - riiie	aueu bii	ialy III	ee - Billary Sea	iicii iiee -	Dillary	CO4
UNIT - V	Graphs, Tables and Sets				Periods:09		M	
Graph: Basic Te	erminologies and Representations - Graph travers Applications. Sets: Representation of Sets- Open	sal algorithmations and its	s. Tables	s: Diffe	ent types of ta	bles - Hash	n Table and	CO5
Lecture Period		Practica			Т	otal Period	ds:45	
Text Books			••••••		t			
1. Ellis Horowitz	, Sartaj Sahni," Fundamentals of Data Structures	", Illustrated	Edition,	Compu	ter Science Pr	ess, 2018.		,
2. Thomas H. Co	oreman, Charles E. Leiserson, Ronald L. Rivest a	and Clifford S	tein, "Int	troducti	on to Algorithn	ns", PHI, Th	nird Edition, 2	2010.
	, Jeffrey D. Ullman, John E. Hopcroft, "Data Struc	ctures and Al	gorithms	", 4 <sup>th</sup> E	dition, 2009.			
Reference Boo								
1. D. Samanta, '	Classic Data Structures", Prentice-Hall of India,	Second Edition	n, 2012	in o"	Proptice Hall	of India		
<ol><li>Robert Kruse Second Edition</li></ol>	, C.L. Tondo and Bruce Leung, "Data Structures	and Program	Design	III C .	Prentice-nair	Ji iiiuia,		
3 Mark Allen W	eiss, "Data Structures and Algorithm Analysis in (	C". Pearson l	Educatio	n, Sec	ond. Edition,20	06.		
4. Mark Allen	Weiss," Algorithms, Data Structures and F	Problem So	ving w	ith C+	+", Illustrated	Edition,	Addison-We	esley
Publishing Co	ompany, 1995.							
<ol><li>Mark Allen W Edition, 1995.</li></ol>	eiss," Algorithms, Data Structures and Problem S	Solving with C	;++", Ad	dison- \	vesiey Publist	ing Compa	any, illustrate	a
Web Reference								••••••••••
	eeksforgeeks.org/data-structures/							
2. https://www.ja	avatpoint.com/data-structure-tutorial/							
	tudytonight.com/data-structures/							
4. https://www.tu	utorialspoint.com/data_structures_algorithms/							
o. nttps://www.w	/3schools.in/data-structures-tutorial/intro/							

\* TE – Theory Exam, LE – Lab Exam

B.Tech. Computer Science and Engineering

115

COs	31.	n Type n Masse	ter Elet Angganun	25.m.+8	Pro	gram O	utcome	s (POs)	CARREL CARREST			1		gram Spe comes (P	
cos	PO1	PO2	РОЗ	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	1	- 1	-	-	-	-	-	(-)	-	3	2	3
2	3	2	1	1	-	- '	-	-	-	0 - 11 bru	g. 4-111-1101	ng (12-br) au 10-b	3	2	3
3	3	2	1	1	-	_	-	-		Unio sine	Maria ar	t was teach	3	2	3
4	3	2	1	1	×-	-	H	-	c-atō, -	<del>.</del>	. + .		3	2	3
5	3	2	1	1	-	-	-	-		4. 7 <u>.</u>	100	() + <u>.</u> 19	3	2	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Method**

		Continu	ous Asse	ssment Marks (	CAM)	End	hing aginy
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	n naed	.0	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

B.Tech. Computer Science and Engineering

11

Department	Compi	uter Science and Engineering	Program	nme: <b>B.</b> 7	Гесh.				
Semester	11/111		Course	Categor	y: PC	*End S	Semester l	Exam Typ	e: <b>LE</b>
Jemester	11/111		Perio	ds/Wee	k	Credit	Ma	ximum Ma	ırks
Course Code	U23CS	PC02	L	T	Р	С	CAM	ESE	TM
Course Name	Data S	tructures Laboratory	0	0	2	1	50	50	100
Oddioc Haine		(Common to all Bra	nches Exce	pt CSB	S and F	T)	<u> </u>		
Prerequisite	Basic	Programming Knowledge	*						
	On co	ompletion of the course, the stud	lents will b	e able to	<b>o</b> , ,				apping st Level)
	CO1	Analyse the algorithm's / program's ef	ficiency in te	ms of tin	ne and s	pace complex	city.	ľ	(3
Course	CO2	Solve the given problem by identifying	the appropri	ate Data	Structur	e.		ŀ	(3
Outcomes		Solve the problems of searching and s						THE P	(3
								ŀ	<b>&lt;</b> 4
	CO4	•						L	<b>&lt;</b> 4
	CO5	Solve problems in non-linear Data Str	uctures.				*	ŗ	<b>\</b> -T

#### List of Exercises:

- Write a C program to implement recursive and non-recursive i) Linear search ii) Binary Search.
- 2. Write a C program to implement i) Bubble sort ii) Selection sort iii) Insertion sort iv) Shell sort v) Heap sort.

3. Write a C program to implement the following using an array. a) Stack ADT b) Queue ADT

- 4. Write a C program to implement list ADT to perform following operations a) Insert an element into a list. a) Delete an element from list b) Search for a key element in list c) count number of nodes in list.
- 5. Write a C program to implement the following using a singly linked list. a) Stack ADT b) Queue ADT.
- 6. Write a C program to implement the dequeue (double ended queue) ADT using a doubly linked list and an array.
- 7. Write a C program to perform the following operations:
  - a) Insert an element into a binary search tree.
  - b) Delete an element from a binary search tree.
  - c) Search for a key element in a binary search tree.
- Write a C program that use recursive functions to traverse the given binary tree in
- a) Preorder b) Inorder c) Postorder.
- 9. Write a C program to perform the AVL tree operations.
- 10. Write a C program to implement Graph Traversal Techniques.
- 11. Write a C program to implement the Set operations.

a) Union b) Intersection					Total Periods: 30
Lecture Periods:	-	Tutorial Periods:	-	Practical Periods: 30	Total Ferious. 30
Lecture 1 errode.				<u>_</u>	

### Reference Books

- Yashavant Kanetkar, "Data Structures through C", BPB Publications, 3rd Edition, 2019.
- 2. Tenebaum Aaron M, "Data Structures using C', Pearson Publisher, 1st Edition, 2019.
- 3. Manjunath Aradhya M and Srinivas Subramiam, "C Programming and Data Structures", Cengage India 1st Edition, 2017.
- Reema Thareja, "Data structures using C", Oxford University, 2nd Edition, 2014.
- 5.Gav.pai, "Data Structures and Algorithms", McGraw-Hill India, 1st Edition, 2013.

#### Web References

- 1. https://www.tutorialspoint.com/data\_structures\_algorithms/
- 2. https://www.w3schools.in/data-structures-tutorial/intro/
- 3. https://nptel.ac.in/courses/106103069/
- 4. https://swayam.gov.in/nd1\_noc20\_cs70/preview
- 5. https://nptel.ac.in/courses/106103069

\* TE - Theory Exam, LE - Lab Exam

B.Tech. Computer Science and Engineering

COs					Prog	ram O	utcom	es (PO	s)	Territorio	Englas	liela, serie	Prog	ram Spe omes (P	ecific SOs)
000	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	1	55 L	-	PHATV	Louis		-	-	-	3	2	3
2	3	2	1	1	-			-	. <b>-</b>	- 1	-	-	3	2	3
3	3	2	1	1	-	. <u> </u>		-	-	<del>-</del>	Ālei	HOGE I	3	2	3
4	3	2	1	1	-	-	-	-	_	-	<u>-</u>		3	2	3
5	3	2	1	1	-	-	a fich	au Mitro	- n - n	ita Tadi			3	2	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

# **Evaluation Method**

		Continuous	Assess	ment Marks (CAN	Л)	The state of the state of	
Assessment	1	ce in pract asses	ical	Model		End Semester	Total Marks
	Conduction of practical	Record work	viva	Practical Examination	Attendance	Examination (ESE) Marks	IVIATKS
Marks	15	5	5	15	10	50	100

B.Tech. Computer Science and Engineering

11

Department	Comp	uter Science and Engineering	Progran			······································			
Semester	111		Course	Categor	y: PC	End	d Semester		
Course Code	U23CS	BC01	Perio	ds/Wee	k	Credit	Max	imum Maı	ks
			L M	Tel	Р	С	CAM	ESE	TM
Course Name	Design	and Analysis of Algorithms	2	0	2	3	50	50	100
Oodisc Hame	Doolgi	(COMMON T		İ	3)	L			1.00
Drozogujejto	Drobl	em Solving Approaches	O COL an	a Alabe					
Prerequisite	On or	ompletion of the course, the stu	dents will	he able	to			BTM	apping
	Once	ompletion of the course, the sta	uciits wiii	DC UDIC				(Highes	
	CO1	Analyze and improve the efficiency	of algorithm	s and es	timate 1	he performan	ce of	K	
	001	algorithm and Divide and Conguer.							
	CO2	Determine the Greedy paradigms, D	ynamic Pro	grammir	ng and	explain when a	an	K	3
Course		algorithmic design situation calls for	it.	ad Daum	4 ND L	lord paradiam	c and evnlai	n K	3
Outcomes	CO3	Interpret the Backtracking paradigm when an algorithmic design situation	s, Branch a calls for it	na Bouri	u, INP-F	iaru parauigini	s and explai	II N	.5
	CO4	Demonstrate programs using Divide	and Congu	er. Gree	dv para	digms.		K	3
		Build the programs using Dynamic F					d Bound	K	2
	CO5				acking a	··· <del>··</del> ·······························			<u></u>
UNIT - I	Intro	duction To Algorithm and Divide	e and Con	quer	lvoio .	Periods:10		complexity	J
ntroduction – Algo	orithm – P	seudo code for expressing algorithms h notation – Omega notation – Theta	notation an	nce Ana I Little ol	iysis – h notati	on	ty – Space (	omplexity	CO1
Asymptotic Notation	on — Big o	od: Binary search – Merge sort – Qui	ck sort	a Little of	Hotati	011.			
UNIT - II	Gree	dy Method and Dynamic Progra	mmina			Periods:10	)		
reedy method:	General m	nethod – applications– Knapsack prot	olem – Minin	num cos	spann	ing trees -Sing	gle source s	hortest pat	h
roblem									
ynamic Program	mming: A	pplications – Multistage graphs – 0/	1 knapsack	problem	, All pa	irs shortest pa	ath problem	<ul> <li>Travelin</li> </ul>	9
ales person prob	lem								
UNIT - III	Back	tracking and Branch and Bound	d _	1		Periods:10		tonion ovol	
Backtracking: Ge	eneral met	hod. Applications – N – queen proble	m – Sum of	subsets	problen	1 – Graph colo	ning – nami	tornari cyci	CO3
- 0/1 Knapsack Pr	roblem. nd: Gones	ral method - Applications - Traveling	sales perso	n proble	m – 0/	1 knapsack pr	oblem – LC	Branch an	d CO3
Bound solution –F	IFO Bran	ch and Bound solution	00.00 po.o.						
UNIT - IV	Labo	ratory Exercises	ees I nah	12815	100.7	Periods:18	5	Tada A	
		y search using Divide-and-Conquer te	chnique						
Implementation	n of Findir	ng Maximum and Minimum using Divi	de-and-Con	quer tecl	nnique.				CO4
Implementatio	n of Knap	sack using Greedy technique.							
Implementatio	n of Minim	num Spanning Tree using Prim's and	Kruskal's Al	gorithm i	using G	reedy technique	ue.		
Implementatio	n of Single	e-Source Shortest Paths algorithms u	sing Greedy	techniq	ue.				
miplomomatic									1
UNIT - V	Labo	ratory Exercises	DLES III SE			Periods:18	5		
Implementatio	n of All Pa	airs Shortest Paths using Dynamic Pro	ogramming t	echnique	е.				CO5
Implementatio	n of Trave	eling Salesman Problem using Dynam	ic Programr	ning tech	nnique.				000
Implementatio	n of 8 Que	eens Problem with the approach of Ba	acktracking.						
		of subsets with the approach of Backt							
Implementatio	n of Trave	eling Salesman problem with Branch-a	and-Bound t	echnique	€.				
/ B : - I	2 0	Tutorial Periods: -	Practic	al Pario	de: 30	T 7	otal Perio	ds:60	L
_ecture Periods	5:30	Tutoriai Perious	Fractic	arr erre	u3. 00	<u></u>	Otari One	40100	
Text Books			aorithmo" D	oorcon E	Education	on India 1st Fo	lition 2019		
I. Levitin Anany	," Introdu	ction to the Design and Analysis of Al	gonunns , P Igotia Bublic	earson c	nd Edit	ion 2010	illio11,2013.		
2. E. Horowitz a	ind S.San	ni, "Fundamentals of Algorithms", Gal erson, R.L.Rivest, and C.Stein, "Introd	youa Fublic	aliulis, 2	' DHI/E	on, 2010. Pearson Educa	tion 3rdEdi	tion 2009	
3. T.H.Cormen,	C.E.Leise	erson, R.L.Rivest, and C.Stein, Introd	luction to Aig	jonums	,	earson Luuca	illori, ordical		
Reference Boo	ks								
		n & Analysis of Computer Algorith	ms", Pears	on Edu	cation	India,2nd Ed	lition,2018		
2. Basu S. K.,"	Design	Methods and Analysis of Algorithr	ns", PHI Le	arning.	3rd Ed	ition, 2018.			
B. Anany Levit	in "Intro	duction to the Design and Analysis	s of Alaoritl	nms", P	earson	Education,	Third Editio	n, 2012.	
	,	ahni "Fundamentals of Algorithms	" 2nd Edit	ion Ga	lantia I	Publications	2010		

T.H.Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, "Introduction to Algorithms, 3rd Edition, PHI/Pearson Education,

4. E. Horowitz and S.Sahni, "Fundamentals of Algorithms", 2nd Edition, Galgotia Publications, 2010.

2009.

#### leb References

- 1. https://www.tutorialspoint.com/design\_and\_analysis\_of\_algorithms/
- https://www.javatpoint.com/daa-tutorial
   https://www.guru99.com/design-analysis-algorithms-tutorial.html
   https://www.geeksforgeeks.org/fundamentals-of-algorithms/
   https://swayam.gov.in/nd1\_noc20\_cs71/preview

:Os/POs/PSOs Mapping

COs		27			Pro	ogram O	utcome	s (POs)			1 - 386 or	There		gram Spe comes (PS	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	2	2	mo Tro	1.40 J	, <del>1</del> 1	1	1	2	abotice.	2	1	1
2	3	3	2	2	2	-	- v.	-	1	1	2	חמים: כ.	2	1	1
3	3	3	2	2	2	-	- 1	-	1	1	2		2	1	1
4	3	3	3	3	2	-	-	-	2	1	2		2	1	2
5	3	3	3	3	2	-	-	-	3	1	2		2	1	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

valuation Method

	120			Continuous A	ssessmen	t Marks (CAM) –	Maximum 50	Marks	fred to a		min listancia	
		Contir	uous Asse	ssment (Theory)			Continuous A	ssessme	nt (Practi	cal)	#End	Lang.
sessment	CAT 1	CAT 2	Model	Attendance	Total	Conduction of Practical	Report	Viva	Total	#End Semester Examination (ESE) Marks (Practical- Internal Evaluation)	Semester Examination (ESE) Marks (Theory)	Total Marks
Marks	5	5	5	5	20*	15	10	5	30*	and galou be. Topo miles	75**	100
*T	o be we	eighted	for 10 Ma	rks	10	*To be weig	hted for 10	Marks	10	30	*To be weighted for 50 Marks	W-

olication oriented / Problem solving / Design / Analytical in content beyond the syllabus

<sup>\*</sup> TE – Theory Exam, LE – Lab Exam

	·············		······T						
Department	Comp	uter Science and Engineering	Programi	ne: <b>B.Te</b> o	ch.				
Semester	III		Course Ca	ategory: <b>P</b>	C	En	d Semester E	xam Type: <b>TE</b>	
Course Code	U23CS	EDC01	Period	ds/Week		Credit	Max	ximum Marks	
Course Code	02303	SDC01	L	Т	Р	C	CAM	ESE	ΤN
Course Name	Automa	ata and Compiler Design	3	0	D	3	25	75	10
		(Commo	n to CSE and A	AI&DS)				0 1 67 1	
Prerequisite	NIL								
*	On co	empletion of the course, the stude	nts will be a	ole to				BT Mapp (Highest Le	vel)
	CO1	Understand the concept of Finite A	utomata, NF	A and DI	FA.			K2	
Course	CO2	Understand about Context Free La	anguage and	Normal F	orms			K2	
Outcomes	CO3	Construct Push Down Automata a						КЗ	
	CO4	Explain the concept of Lexical Ana			lvsis			K3	
	CO5	Describe the Intermediate code ge				and Code Ge	neration	K3	
UNIT - I		Automata and Regular Expression				Periods:09			
NFA with epsilo	n transitio	a – Deterministic Finite Automata – n - Eliminating epsilon transition -Re xpression to DFA (Direct / Indirect m	gular Expres	sion- Co	nversio	omata – Conv n from Regula	ersion from ar Expression	NFA to DFA on to NFA-	co
UNIT - II	Conte	ext-Free Grammar and Normal For	ms			Periods:09			
upes of Gramm		sky's hierarchy of languages -Contex		mar (CF	G) – De	erivations and	Parse tree	s – Ambiguity	
grammars – No	ormal Form	ns – Chomsky Normal Form – Greiba	ach Normal F	orm.	-,				co
UNIT - III		down Automata and Turing Machi			(1	Periods:09			
ush Down Auto achine - Turing	mata (PDA machines	<ul> <li>Definition of the Pushdown Autom for regular languages- Turing machi</li> </ul>	nata - Langua ine construct	iges of prion for Pa	ushdow alindror	n automata – ne, Addition, s	CFG to PD Subtraction.	A -Turing	со
UNIT - IV	Lexic	al Analysis and Syntax Analysis				Periods:09		10	
omnilers: The P	hases of c	ompiler – Lexical analysis – The role up Parser – Shift Reduce Parser - C	of the lexica Operator Pred	l analyse cedence	r – Inpu Parser-	ut buffering – I -SLR Parser.	Parser: Top	-Down Parser	CO4
UNIT - V		nediate Code Generation, Code Oration	ptimization	and Cod	е	Periods:09			
ode Generation	le Generat n: Issues ir	ion: Intermediate Languages. Code ( n the design of code generator – Si ck - Generating code form DAGs - Po	imple code g	enerator	e source – Basi	es of optimiza ic blocks and	tion – Loop flow graph	Optimization. s – The DAG	со
ecture Periods		Tutorial Periods: -	Practica	al Period	s: -	'	Total Perio	ds:45	
ext Books									
Alfred Aho, V.	Ravi Seth	Automata Theory, Languages, and i, and D. Jeffery Ullman, "Compilers ction to Languages and the Theory o	Principles,	Γechniqu	es and	Tools", Addis	son-Wesley	, 2 <sup>nd</sup> Edition, 2	2007
eference Book	S		,						
. Kamala Krithi	vasan, Rar	na R, "Introduction to Formal langua					Pearson, 20	)19.	
		tion to Formal Languages and Auton							

- . Anil Malviya, Malabika Datta, "Theory of Computation & Applications Automata Theory Formal Languages", BPB publications, 2015.
- . Charles N. Fischer and Richard J. Leblanc, "Crafting a Compiler with C", Benjamin Cummings, 2009.
- . Mishra K.L.P, "Theory of Computer Science: Automata, Languages and Computation", Prentice Hall India Learning, 1st Edition, 2006.

#### **Veb References**

- 1. https://www.cse.iitb.ac.in/~akg/courses/2019-cs310/index.html
- 2. https://www.cse.iitm.ac.in/~krishna/cs3300/
- 3. https://www.geeksforgeeks.org/theory-of-computation-automata-tutorials/
- 4. https://www.javatpoint.com/automata-tutorial
- 5. https://www.tutorialspoint.com/automata\_theory/index.htm

<sup>\*</sup> TE – Theory Exam, LE – Lab Exam

COs	MI.	729	1		Prog	gram O	utcome	es (POs	)			January and	Prog Outc	ram Spe omes (P	cific SOs)
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	3	2	3	3	1	1		2	-		-	3	2	2
2	3	3	3	2	3	1	2	-	2	1	-	2	3	2	2
3	2	3	2	3	2	2	-	270	3	7/ 42/11/11	oly <u>T</u> atil 4	na de la cons	3	2	2
4	3	3	2	3	3	1	- <b>-</b> A -	n Fair	2	n ng <u>a</u> ut s	Indiana u	101 H3 80	3	2	2
5	2	3	3	2	2	2	1	leritin g	2	n de			3	2	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

11 .on 1		Conti	nuous Assessme	ent Marks (CAM)	eCaulta girgi	End	nme le C
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	1	0	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

	Com	puter Science and Engineering	Prograr	nme: <b>B.</b>	Гесh			AU	
Semester	IV		Course	Catego	y: <b>PC</b>	End	Semester	Exam Typ	e: <b>TE</b>
Course Code	11330	STC04	Perio	ds/Wee	k	Credit	Max	imum Marl	(S
Course Code	0230	31004	L	Т	Р	С	CAM	ESE	TM
Course Name	Datal	base Management Systems	3	0	0	3	25	75	100
		(Common t	to CSE, IT a	nd CCE)			1 -		
Prerequisite	Com	puter Programming and Data Str	uctures			4			
	On co	ompletion of the course, the stud						BT Map (Highest	
Course	CO1	Explain the concepts of Database Relationship model and Relationa	al Models	for a giv	en appli	ication		K2	
Outcomes	CO2	Manipulate and build database que relational algebra				2011		K3	
	CO3	Use data normalization principles application				database fo	or a given	K3	
	CO4	Illustrate various transactions and	d recovery	technic	lues			K2	
	CO5	Apply tools like NoSQL, MongoDI	B, Cassar	idra on r	eal time			K3	
UNIT - I		duction				Periods:0			ſ
		a Models – System Structure-Datab							CO
		Model - ER into Relational Mode	el - Relati	onal Mc	idel: Str	ucture of R	delational L	oatabases,	6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
atabase Schem		,				DoriodoiA	0		
UNIT - II		base Languages			<u>_</u>	Periods:0			
		ended-Relational Algebra - Relatio					DL - DML	- Integrity	CO
Constraints - Set		ons - Joins - Nested Queries - Viev		- Stored	Proced				
UNIT - III	Relat	ional-Database Design and Data	Storage			Periods:0	9	1	
Relational Datab	ase Des	sign: Domain and Data Dependenc	cy - Lossle	ess Desi	gn - Arm	strong's axi	oms - Fund	ctional	001
Dependencies - I	Normal F	Forms - 1NF, 2NF, 3NF, BCNF and	4NF.						CO
ata Storage: R		e Organization - Indexing: Types of	Indexing.	- 44					
		sactions				Periods:0			
		detetee Community Evenution Co	erializabiliţ	y -Query				ntrol: Lock	
ransaction cond		d states- Concurrent Execution - Se				01 1	<b>D</b> .		COA
ransaction cond ased Protocol -	Timesta	mp based Protocol - Recovery Sys	stem: - Lo						CO4
ransaction conc ased Protocol - UNIT - V	Timesta NoSC	mp based Protocol - Recovery Sys QL Databases		g-Based		ery - Shado Periods:0			CO4
ransaction conc ased Protocol - UNIT - V	Timesta NoSC	mp based Protocol - Recovery Sys		g-Based					CO4
ransaction cond pased Protocol - UNIT - V NoSQL - Docume	Timesta NoSC ent Datal	mp based Protocol - Recovery Sys QL Databases base: MongoDB - Multi-dimensiona	ıl: Cassan	g-Based dra.		Periods:0	9	ods:45	CO4
pased Protocol - UNIT - V NoSQL - Docume Lecture Period	Timesta NoSC ent Datal	mp based Protocol - Recovery Sys QL Databases	ıl: Cassan	g-Based		Periods:0		ods:45	CO4
ransaction conditions conditions considered Protocol - UNIT - V NoSQL - Docume Lecture Period Text Books	Timesta NoSC ent Datal	mp based Protocol - Recovery Sys QL Databases base: MongoDB - Multi-dimensiona   Tutorial Periods: -	al: Cassan	g-Based dra.	ods: -	Periods:0	9 otal Perio		CO4
ransaction condased Protocol - UNIT - V loSQL - Docume cecture Period ext Books  1. Silbersch Internatio 2. Ramez E	NoSCent Datal   Is:45   matz, Koronal Edit	mp based Protocol - Recovery Sys  QL Databases base: MongoDB - Multi-dimensiona  Tutorial Periods: -  th, Sudarshan, Database System (ion, 2019. and Shamkant B. Navathe, Fundar	l: Cassan Practio	g-Based dra. cal Peri	ods: -	Periods:0 T Graw-Hill H	9 otal Perio		CO4
ransaction condased Protocol - UNIT - V IoSQL - Docume ecture Period ext Books  1. Silbersch Internatio 2. Ramez E Publishe	NoSC ent Datal ls:45 natz, Kor onal Edit Elmasri, a r: Pearso	mp based Protocol - Recovery System Cale Databases base: MongoDB - Multi-dimensiona  Tutorial Periods: -  th, Sudarshan, Database System Cale Database Syste	Praction Concepts, mentals of	g-Based dra. cal Peri 7 <sup>th</sup> Editi	ods: - ion - Mc	Periods:0  T  Graw-Hill H  ems (7th ed	otal Perionigher Education),	ation,	CO
ransaction condased Protocol - UNIT - V IoSQL - Docume ecture Period ext Books  1. Silbersch Internatio 2. Ramez E Publishe 3. Raghu R	NoSCent Datal s:45  matz, Koronal Edit Elmasri, ar: Pearso	mp based Protocol - Recovery Sys  QL Databases base: MongoDB - Multi-dimensiona  Tutorial Periods: -  th, Sudarshan, Database System (ion, 2019. and Shamkant B. Navathe, Fundar	Praction Concepts, mentals of	g-Based dra. cal Peri 7 <sup>th</sup> Editi	ods: - ion - Mc	Periods:0  T  Graw-Hill H  ems (7th ed	otal Perionigher Education),	ation,	CO
ransaction condased Protocol - UNIT - V IOSQL - Docume ecture Period ext Books  1. Silbersch Internatio 2. Ramez E Publishe 3. Raghu R Reference Book	NoSCent Datal s:45  matz, Koronal Edit elmasri, ar: Pearso amakris	mp based Protocol - Recovery System Control of S	Praction Concepts, mentals of	g-Based dra. cal Peri 7th Editi Databa ourth Ed	ods: - on - Mc se Syste	Periods:0  T  Graw-Hill H  ems (7th ed  cGraw-Hill (	otal Perionigher Education), College Pul	ation,	CO4
ransaction condased Protocol - UNIT - V loSQL - Docume ecture Period ext Books  1. Silbersch Internatio 2. Ramez E Publishe 3. Raghu R Reference Book 1. Raghu R	NoSCent Datal s:45  matz, Koronal Edit Elmasri, a r: Pearso amakris amakris , Kanna	mp based Protocol - Recovery System Case: MongoDB - Multi-dimensional  Tutorial Periods: -  th, Sudarshan, Database System Case, 2019. and Shamkant B. Navathe, Fundaron, 2016. hnan, —Database Management System Case, and Swamynathan S, "An Introduction, "An Introduction,"	Practic  Concepts, mentals of ystems, Fostems", Fostems	dra.  cal Peri  7th Editi Databa  ourth Edi	ods: - fon - Mc se Syste	Periods:0  T Graw-Hill H ems (7th ed cGraw-Hill (	otal Perionigher Education), College Publicollege Publicollege Publicollege Publicollege Publicollege Publicollege Publicollege Publicollege Publicollege	ation, blications,	CO4 CO5

#### eb References

- 1. http://www.database.com/
- 2. http://cassandra.apache.org/
- 3. https://www.mongodb.com/

# COs/POs/PSOs Mapping

COs	pr 1		l II -	70	Prog	gram (	Outcon	nes (PC	Os)		F 1-	and had well i	Program Specific Outcomes (PSOs)			
-											PO12	PSO1	PSO2	PSO3		
2	1	_	-	_	-			.7193	-	er Jus	cont Fisher	- 	3	3	2	
3	2	1	1	3	. Te	1 20		-	-	1 32 1		Entre 1964	3	3	2	
3	2	1	1		-		-	-	-	-	-	-	3	3	2	
2	1	_	rly <u>.</u> ·	-	-			-	-		-	-	3	3	2	
3	2	1	1	3	J 195		-	_	-	-	-		3	3	2	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Methods**

	100	Con	tinuous Asses	sment Marks (CA	M)	End	act agent.
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

TE – Theory Exam, LE – Lab Exam

Department	Computer Science and Engineering	Program	me: <b>B.T</b>	ech.				
Semester	IV	Course C	ategory	: PC	End	Semester	Exam Type	: LE
Course Code	1133CSDC03	Perio	ds/Week	<b>(</b>	Credit		ximum Mai	
Course Code	U23CSPC03	L	Т	Р	С	CAM	ESE	TM
Course Name	Database Management Systems Laboratory	0	0	2	1	50	50	100
	(Common t	o CSE, IT ar	nd CCE)	L		<u>I</u>	L	I
Prerequisite	Data Structures and Algorithms							
	On completion of the course, the stud				J		BT Ma (Highest	
	CO1 Implement relational database syst	ems using	SQL st	tatemen	its.		***************************************	(3
	CO2 Use typical data definitions and ma	nipulation	comma	ands in v	arious appl	ications.	K	(3
Course	CO3 Demonstrate applications using Ne	sted and .	Join Qu	eries			K	3
Outcomes	CO4 Execute various advance SQL quer	ries related	d to Trai	nsactior	n Processino	].	K	3
List of Exercises	CO5 Build commercial relational databas	se systems	s using t	trigger a	and cursor c	oncept.	K	3
tructured Query								
<ol> <li>Aggregate</li> <li>Joins</li> <li>Built in Fui</li> <li>Nested Qual</li> <li>Set Opera</li> <li>View</li> <li>Transaction</li> <li>Data Control</li> <li>Simple PI/S</li> <li>Trigger</li> </ol>	nctions Jeries tions n Control Language rol Language							
ecture Periods:		D4:	I D!	100		7.16 :	6	
eference Books	- Tutorial Periods: -	Practica	Period	15:30	10	otal Period	ds:30	,
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				-		
	veloper Handbook.	lraa Dr	T!-	D				
3. Alan Beau	QL for Oracle by P.S. Deshpande, IIT Mad lieu, Mastering SQL Fundamentals, 2 <sup>nd</sup> Ed	iras, Drea	m rech	Press.				
4. Silberscha	tz, Korth, Sudarshan, Database System C	inion, O R	ellly,20	U9 	S T. 1911 J. 19			_

4. Silberschatz, Korth, Sudarshan, Database System Concepts, 7th Edition - McGraw-Hill Higher Education, 2019

# leb References

- www.oracle-developer.net
   www.oracle.com/DBA

COs					Pro	gram	Outco	nes (P	Os)					gram Spectomes (F	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	2	3	2	2	1	-	2	1	-	2	2	3	2
2	3	2	3	3	2	2	1	h <u>a</u> 17	2	1	1 1 2 2	<u>-</u> -	3	3	3
3	3	3	3	3	2	2	2		2	1		1 - 2	3	2	3
4	3	2	3	3	2	2	1	9 t <u>s</u>	2	1			3	3	3
5	3	3	3	3	2	2	2		2	1	-	-	3	2	3

Correlation Level: 1-Low, 2-Medium, 3-High **Evaluation Method** 

	Co	ontinuous	Assessr	nent Marks (CA	M)	1,01		
Assessment		nce in prac lasses	tical	Model		End Semester	Total Marks	
	Conduction of practical	Record work	viva	Practical Examination	Attendance	Examination (ESE) Marks		
Marks	15	5	5	15	10	50	100	

Department		uter Science and Engineering		mme: <b>E</b>		······································			
Semester	IV					e: <b>PC</b> *End			
Course Code	U23CS	TC05	Peri	ods / W	T	Credit		kimum Ma	
Course Name	Opera	ting Systems	3	Т 0	P 0	С 3	CAM	ESE 75	100
			on to CSE ar		U	3	25	75	100
Prerequisite	Nil	(6011111)	or to ool a	1011)			n militaria		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								BT Ma	nning
	On co	ompletion of the course, the stud				1111		(Highes	
	CO1	Describe the various OS functionalitie				1 7.1		K	2
Course	CO2	Usage of system calls related to OS m process states and process scheduling		and inter	preting o	ifferent stage	es of variou	K	4
Outcome	CO3	Apply and explore the communication	between inte	er proce	ss and D	eadlock avoi	dance.	K	3
	CO4	Implement page replacement algorith	ms, memory	manage	ment pro	blems and s	egmentatio	n K	2
	CO5 Apply various disk scheduling algorithms and I/O Hardware								
Unit- I	nit- I Introduction to Operating Systems Periods: 09								
	ating Sys	tems (OS), Generations of OS, Types							
rchitectural cond		an OS, Concept of Virtual Machine, Re							
S.									
I	T _	as Managarant and Calcadallina		<u> </u>		Dariada, A	0		
rocesses: Defir rocess Control E rocess Schedi	nition, Pro Block (PC uling: F	ess Management and Scheduling occss Relationship, Different states of a CB), Context switching. Coundation and Scheduling objectives time, Waiting Time, Response Time.	a Process, Pr	ocess S	tate tran		R [109]	utilization	CO
rocesses: Defir rocess Control E rocess Schedi hroughput, Turn cheduling algo	nition, Pro Block (PC uling: F around T rithms: I	ocess Relationship, Different states of a CB), Context switching.  oundation and Scheduling objectives rime, Waiting Time, Response Time.  Pre-emptive and non-pre-emptive, FCF	a Process, Pr s, Types of S, SJF, RR.	ocess S	state trans	sitions,	iteria: CPU	utilization	CO
rocesses: Defir rocess Control E rocess Schedi hroughput, Turn cheduling algo Unit- III	nition, Pro Block (PC uling: F around T rithms: I	ocess Relationship, Different states of a CB), Context switching. Soundation and Scheduling objectives ime, Waiting Time, Response Time. Pre-emptive and non-pre-emptive, FCF s Synchronization, Threads and Dead	a Process, Pros., Types of S, SJF, RR.	Schedu	itate trans	sitions, heduling cri	iteria: CPU		
rocesses: Defir rocess Control E rocess Schedi nroughput, Turn cheduling algo Unit- III ter-process Co plution, The Pro friter Problem, D concurrent Prog ocess (CSP); Do pres of threads,	nition, Pro- Block (PC uling: F around T rithms: I Proces ommunic ducer / ( pinning P grammin eadlocks , Concep	ocess Relationship, Different states of a CB), Context switching.  oundation and Scheduling objectives rime, Waiting Time, Response Time.  Pre-emptive and non-pre-emptive, FCF	a Process, Process, Process, Types of S, SJF, RR.  locks s, Mutual Exconomicors, Mesonitors, Mesonitors, Trecovery. Theon, Necessal	Scheductusion, esage Pars, concentread: Erry and s	Hardware assing, Current lar Definition, sufficient	Periods: 0  Solution, Solassical IPC guages, con	g emaphores, Problems: nmunicating	Peterson's Reader's & sequential of threads,	CO
rocess Control E rocess Schede hroughput, Turn cheduling algo Unit- III hter-process Co olution, The Pro driter Problem, D concurrent Progress (CSP); De	nition, Pro- Block (PC uling: F around T rithms: I Proces ommunic ducer / ( pinning P grammin eadlocks , Concep	cess Relationship, Different states of a CB), Context switching. coundation and Scheduling objectives ime, Waiting Time, Response Time. Pre-emptive and non-pre-emptive, FCF is Synchronization, Threads and Dead action: Critical Section, Race Condition Consumer Problem, Event Counters, Mailosopher Problem. In Critical region, conditional critical region, conditional critical region, and of multithreads. Deadlocks: Definition Avoidance: Banker's algorithm, Deadlocks.	a Process, Process, Process, Types of S, SJF, RR.  locks s, Mutual Exconomicors, Mesonitors, Mesonitors, Trecovery. Theon, Necessal	Scheductusion, esage Pars, concentread: Erry and s	Hardware assing, Current lar Definition, sufficient ecovery.	Periods: 0  Solution, Solassical IPC  guages, con Various stat conditions for	g emaphores, Problems: nmunicating es, Benefits or Deadlock	Peterson's Reader's & sequential of threads,	CO
rocesses: Defiring rocess Control Express Schedular rocess Schedular rocess Schedular rocess Schedular rocess Color rocess Color rocess (CSP); Despress of threads revention and Definite IV  emory Manage xed and variable roces (Remory: Remory: Remory: Remory: Remory: Reging, Page faul	nition, Pro- Block (PC uling: F around T rithms: I Proces mmunic ducer / ( pinning P grammin eadlocks Concepe eadlock Memo ment: Basics of t, Workir	cess Relationship, Different states of a CB), Context switching. CB), Context switching. CB), Context switching. CB), Context switching. CONTEXT STATES STAT	a Process, Process, Process, Process, Process, Process, Process, Process, Process, Mutual Exconomicors, Meson, Monitors, Meson, Necessal ock detection and Compactor of Structures	clusion, esage Pars, concinered: Erry and sen and Remory tion.	Hardware assing, Current lar Definition, sufficient ecovery.	Periods: 0: e Solution, Selassical IPC guages, con Various state conditions for Periods: 0: n: Contiguous rence, Page	generation of the second of th	Peterson's Reader's & sequential of threads, Deadlock	CO
rocesses: Defire rocess Control Erocess Scheduling algo Unit-III rocess Colution, The Proportier Problem, Deformer Programmer Progra	Procession Memore Block (PC uling: F around T rithms: I Procession Municipal (PC around Procession Memore Block Procession Memore Block Procession Memore Block Procession (NEU)	pocess Relationship, Different states of a CB), Context switching. Soundation and Scheduling objectives ime, Waiting Time, Response Time. Pre-emptive and non-pre-emptive, FCF is Synchronization, Threads and Dead ration: Critical Section, Race Condition Consumer Problem, Event Counters, Mailosopher Problem.  Ig: Critical region, conditional critical reprevention, avoidance, detection, and of of multithreads. Deadlocks: Definitional critical reprevention, avoidance, detection, and the of multithreads. Deadlocks: Definitional critical reprevention.  Ig: Management  Ig: Management  Ig: Critical Region, Conditional Critical reprevention, avoidance, detection, and the of multithreads. Deadlocks: Definitional Consumer Problem.  Ig: Management  Ig:	a Process, Process, Process, Process, Process, Process, Process, Process, Process, Mutual Exconomicors, Meson, Monitors, Meson, Necessal ock detection and Compactor of Structures	clusion, esage Pars, concinered: Erry and sen and Remory tion.	Hardware assing, Current lar ecovery.  allocatio	Periods: 0: e Solution, Selassical IPC guages, con Various state conditions for Periods: 0: n: Contiguous rence, Page	emaphores, Problems: nmunicating es, Benefits or Deadlock  s Memory a allocation, F First In First	Peterson's Reader's & sequential of threads, Deadlock	CO
rocesses: Defiritorocess Control Express Scheduling algo Unit- III Inter-process Complete Problem, Description, The Property of threads, prevention and Description, Page faul of Recently User Unit- V  le Management ethods (contiguent, hash table), ethod (contiguent) and page to Hardware: I/O Har	inition, Procession of the pro	pocess Relationship, Different states of a CB), Context switching. Doundation and Scheduling objectives ime, Waiting Time, Response Time. Pre-emptive and non-pre-emptive, FCF is Synchronization, Threads and Dead ration: Critical Section, Race Condition Consumer Problem, Event Counters, Mailosopher Problem.  Ig: Critical region, conditional critical reprevention, avoidance, detection, and the following that the following and the section of the following that the fol	a Process, Process, Process, Types of S, SJF, RR.  locks s, Mutual Exconomitors, Mesonitors, Mesonitors, Mesonitors, Mesonitors, Mesonitors, Mesonitors, Mesonitors, Mesonitors, Processal ock detection and Compactor Structures Page Replacement of Structures, Page Replacement of Structur	Scheductusion, ssage Particusion, and Remory tion.  Localicement  Director	Hardware assing, Current lare Definition, sufficient ecovery.	Periods: 09 Period	emaphores, Problems: nmunicating es, Benefits or Deadlock  allocation, First In First	Peterson's Reader's & sequential of threads, Deadlock allocation — Partitioning, Out (FIFO, Allocation tion (linear	СО

#### **Text Books**

- 1.Abraham Silberschatz, Peter B. Galvin, "Greg Gagne-Operating System Concepts", Wiley, 10th Edition, 2019.
- 2. William Stallings, "Operating Systems: Internals and Design Principles", Pearson, 9th Edition, 2018.
- 3. Andrew S. Tanenbaum, "Modern Operating Systems", Pearson, 4th Edition, 2016.
- 4. Tanenbaum, Andrew S., and Albert S. Woodhull. "Operating systems: design and implementation", Vol. 68. Englewood Cliffs: Prentice Hall, 1997.

#### Reference Books

- 1.Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, "Operating Systems: Three Easy Pieces", Arpaci-Dusseau Books, Inc 2015.
- 2. Thomas Anderson and Michael Dahlin, "Operating Systems principles and practicell", Wiley, 2nd Edition, 2014.
- 3. Gary Nutt," Operating System, A modern perspective", 3rd Edition, Addison Wesley, 2004.
- 4. B.L. Stuart, "Principles of Operating Systems Cengage learning", India Edition, 2004.
- 5. Deitel, Harvey M., Paul J. Deitel, and David R. Choffnes, "Operating systems", Delhi. Pearson Education: Dorling Kindersley, 2004.

#### **Neb References**

- I. https://nptel.ac.in/courses/106108101/
- 2. http://www.tcyonline.com/tests/operating-system-concepts
- 3. http://www.galvin.info/history-of-operating-system-concepts-textbook
- I. https://www.cse.iitb.ac.in/~mythili/teaching/cs347\_autumn2016/index.html
- i. https://www.cse.iitk.ac.in/pages/CS330.html

Os/POs/PSOs Mapping

Os				ogram Outcomes (POs)	jok snj	Program Specific Outcomes (PSOs)									
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	1	-	1	1	1	1	_	-	-	-	_	2	1	2
2	<u>- 1</u> 6.8.1	2	LUDIN A	2	2	2	2	THE REAL PROPERTY.	-	-		2	2	1	2
3	2	2	2	2	2	-	-	-	- 30		2	wood <del>e</del> n.	2	1	2
1	3	3	-	3	3	3	3	3	-	-	3	3	2	1	2
5	3	3	3	3	3	3	3	3	-	3	-	3	2	1	2

rrelation Level: 1 - Low, 2 - Medium, 3 - High

aluation Method

ssessment		Continuou		End Semester	Total		
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks		0	5	5	5	75	100

oplication oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	uter Science and Engineering	Program	nme: <b>B.T</b>	ech.				••••••	
Semester	ΙV		Course (	Category	:PC	End	Semeste	emester Exam Type: LI		
Course Code	U23CS	SPC04	Perio	ds/Weel	k [	Credit	M	aximum Ma	arks	
Course coue			L	Т	Р	С	CAM	ESE	TM	
Course Name	OPER	ATING SYSTEMS LABORATORY	0	0	2	1	50	50	100	
		(Common t	o CSE ar	nd IT)	L				100	
Prerequisite	NIL									
	On co	ompletion of the course, the stude	nts will		BT Map (Highest I					
	CO1	Understand the basic commands for Linux.						K2		
	CO2	Develop simple shell programs.						K2		
Course	CO3	Implement different Scheduling Algorithm	S					K5		
Outcomes	CO4	Apply the basic concepts of Deadlock Hand	lling proce	dures.				K4		
	CO5	Simulate Disk Scheduling Algorithms.	20					K4		
			76				i	1 1		

- 1. Study of Basic commands to understand the system and working of Linux.
- 2. Shell scripting (I/O, decision making, looping)
- 3. Creating Child process (using fork), Zombie, Orphan. Displaying system information using C.
- I. Write C programs to simulate the following CPU Scheduling algorithms
  - a) FCFS b) SJF
- c) Round Robin
- d) priority
- 5. Write a C program to simulate Bankers Algorithm for Deadlock Avoidance and Prevention.
- 3. IPC (Threads, Pipes)
- 7. Process synchronization (Producer Consumer / Reader Writer/Dining Philosopher using semaphores)
- 3. Dynamic Memory Allocation Algorithms (First fit, Best fit, Worst fit)
- ). Page Replacement Algorithms. (FIFO, LRU, Optimal)
- 0. Disk Scheduling Algorithms.

-ecture Periods:	- =	Tutorial Periods:	-	Practical Periods:30	Total Periods:30
Reference Books			***************************************		

- . Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley
- . Advanced programming in the Unix environment, W.R.Stevens, Pearson education.
- Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau, Operating Systems, Three Easy Pieces, Arpaci- Dusseau Books, Inc, 2015.
- . Dhamdhere, Dhananjay M. Operating systems: a concept-based approach, 2E. Tata McGraw-Hill Education, 2006.
- . Deitel, Harvey M., Paul J. Deitel, and David R. Choffnes. Operating systems. Delhi. Pearson Education: Dorling Kindersley, 2004.

#### **Veb References**

- . https://www.geeksforgeeks.org
- . http://avanthioslab.blogspot.com/2016/08/file-organization-techniques.html
- . https://www.programming.com/programs/c-programs/285-page-replacement-programs-in-c

TE-Theory Exam, LE - Lab Exam

COs	The state of the s												Program Spec Outcomes (PS				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
1	1927 <u> </u>	1	-	1	1	1	1		-	-	-		-		2		
2	-	2	_	2	2	2	2	-	-	-	_	2	-	-	2		
3	2	2	2	2	2	2	-	_	-	-	2	_	_	-	2		
4	2	2	2	2	3	2	11414		A July	DU 2 30	2	o rema	To Tan	140-11	2		
5	2	2	2	2	3	2	-	-	-		2	_	-		2		

Correlation Level: 1 - Low, 2 - Medium, 3 – High Evaluation Methods

# **Evaluation Method**

				nent Marks (CA	M)		
Assassment	Performar	nce in prac	tical	Madal		End	T-4-1
Assessment	Conduction of practical	Record work	viva	Model Practical Examination	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	15	5	5	15	10	50	100

Department	Comput	er Science and Engineering	Progr	amme: I	B.Tech				
Semester	V		Cours	se Categ	gory: <b>PC</b>	End Sem	ester Exa	m Type: <sup>-</sup>	ΓE
Course Code	U23CS1	C06	Pe	eriods/M	/eek	Credit	Ma	ximum M	arks
	is the same	0.752	L	T	Р	C	CAM	ESE	TM
Course Name	ARTIFIC	CIAL INTELLIGENCE	3	0	0	3	25	75	100
		(Common (	CSE, IT a	nd CCE	)				
Prerequisite	Basics of	of Algorithms and Probability						T	
	On con	npletion of the course, the students						(Highes	apping t Level
	CO1	Understand AI fundamentals and ap	ply search	strategie	es to solve	complex pr	oblems	ŀ	(2
0	CO2	Apply the fundamentals of knowledge	je represei	ntation			lese, it	ŀ	(3
Course Outcomes	CO3	Build and Apply Fuzzy logic and Pre	dicate logi	C.					(3
dicomes	CO4	Categorize models and manage und	certainty us	ing prob	abilistic rea	asoning tech	nniques.	.1	(3
	CO5	Apply the AI in different fields						<u> </u>	(3
UNIT - I	Introdu	ction to AI and Problem Solving ns of AI - History of AI - Agents Struct			Land H	Periods:			
UNIT - II ntroduction to I	Knowledge	dge Representation  Representation: Types - Approach	es - Knov	/ledge re	epresentat	Periods:0 ion using S	10-10-10	etwork –	co
Extended seman	tic network	ss - Frames – Conceptual dependenci	es – Script	S.					CO
UNIT - III		nd Predicate Logic				Periods	:09		
Basic Concepts	of Fuzzy	Set Theory – Operations of Fuzzy S	Sets - Pro	perties o	of Fuzzy S	Sets – Crisp	Relations	<ul><li>Fuzzy</li></ul>	
Relational Equat	ions – Ope	erations on Fuzzy Relations – Fuzzy S	ystems – L	ogical A	gents, Pre	dicate Logic	- First-Ord	der Logic,	CO
nference in First	-Order Log	gic, Forward and Backward Chaining.							
UNIT - IV	Proba	bilistic Reasoning				Periods			
Probabilistic No Understanding F Dempster and S	artially Ob	Bayes rule - Bayesian Network - F servable Environments - Inference in ry.	Probabilisti Temporal	c reasor Models -	ning over Hidden M	larkov Mode	els - Kalma	ertainty - n Filters -	CO4
UNIT - V	Applica	tions of Al				Periods			
Al in healthcare Education: Adap	: Disease tive Learni	Diagnosis and Prediction.Al In Fina ng and Assessment – Al in Customer	nce: Auto	mated transition	ading and id Virtual A	Portfolio M ssistance.	lanagemen	t – Al in	CO5
_ecture Perio	ds:45	Tutorial Periods: 0	Pract	ical Per	riods: 0		Total Peri	ods:45	
Text Books		<u> </u>				L			
1. Stuart F	Russell and	Peter Norvig, "Artificial Intelligence: A	Modern A	pproach'	", 4 <sup>th</sup> Editio	n, Pearson	Education,	2020.	
2 Flaine l	Rich Kevir	ı Knight, and Shivashankar B. Nair, "A G.A. Vijayalakshmi Pai, "Neural	rtificial Inte	lligence"	, 3 <sup>rd</sup> Editio	n, McGraw l	Hill, 2017.		esis a

3. S. Rajasekaran, G.A. Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms synthesis and applications",15th Edition, PHI Learning Private Limited,2011.

# Reference Books

- 1. Cherry Bhargava," Artificial Intelligence Fundamentals and Applications", 1st Edition, CRC Press, 2021.
- 2. S. Kanimozhi Suguna, M.Dhivya,Sra Paiva, "Artificial Intelligence Recent Trends and Applications, 1st Edition, "CRC Press,2021.
- 3. Wolfgang Ertel," Introduction to Artificial Intelligence", 2<sup>nd</sup> Edition, Springer, 2018.
- David Poole and Alan Mackworth," Artificial Intelligence: Foundations of Computational Agents", 2<sup>nd</sup> Edition, Cambridge University Press, 2017.
- 5. Chris Thornton, Benedict Du Boulay," Artificial Intelligence through Search",4<sup>th</sup> Edition, Springer Netherlands, 2012.

#### Web References

- 1. https://www.tutorialspoint.com/artificial\_intelligence/index.htm
- 2. https://www.javatpoint.com/artificial-intelligence-ai
- 3. https://www.geeksforgeeks.org/artificial-intelligence/
- 4. https://towardsdatascience.com/
- https://www.coursera.org/
  - \* TE Theory Exam, LE Lab Exam

CO's															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	-	2	2	-	_	-	3 2	na Bill		2	3	2	2
2	3	3	-	2		-	_	_		ų inte	_	2	2	3	2
3	3	3	3	2	2	-	-		THE PARTY		121	2	3	3	2
4	3	2	2	3	3	2	-	-	-	-	H	2	3	3	2
5	2	3	3	2	2	2	2	FILES	17211	ortic grint	Pring P	3	3	3	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High Evaluation Methods

		Cont	inuous Assess	ment Marks (CA	M)	End		
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks	
Marks	5	5	5	5	5	75	100	

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	uter Science and Engineering	Progra	mme: <b>E</b>	3.Tech.					
Semester	V		Course	Categ	ory: <b>PC</b>	End Se	emester Exa	m Type:	LE	
Comedici	U23CS	PC05	Per	iods/We	eek	Credit	Maxi	imum Ma	ırks	
Course Code	02000		+ <b>L</b> I	Int	Р	С	CAM	ESE	TM	
Course Name		ICIAL INTELLIGENCE RATORY	0	0	2	1	50	50	100	
		(Common to								
Prerequisite	Basics	of Algorithms and Probability								
	On co	ompletion of the course, the stu	ıdents w	ill be al	ole to				apping st Level)	
Caura	CO1	Apply Search Algorithms to impalgorithms like Greedy Best First graph-based problems.	Search, A	*, and	AO* to s	solve path	finding and	КЗ		
Course Outcomes	CO2	Solve CSPs with Backtracking to m	is or Sudo	ku usina	backtrac	cking techr	nques.	ŀ	₹3	
	CO3	Develop Inference Engines: Studen	nts will dev Order Loa	elop torv ic for Al	vard and decision-	backward making ta-	chaining sks.	ŀ	₹3	
	CO4	Examine Probabilistic Reasoning: t Markov Models, and Kalman Fil prediction tasks.	o construc	et and us	rks, Hidden	К3				
	CO5   Make use of AI in different applications.									

### List of Exercises

- Implement Greedy Best First Search and A\* Search for pathfinding problems (e.g., solving a grid-based puzzle).
- 2. Model a classic Constraint Satisfaction Problem (e.g., N-Queens problem or Sudoku) and solve using backtracking.
- 3. Implement AO\* search for a graph-based problem.
- 4. Develop an inference engine using forward chaining and backward chaining to deduce conclusions from a given set of facts and rules.
- 5. Implement basic inference techniques in First-Order Logic using forward and backward chaining for an Al-based decision-making task.
- Construct a Bayesian Network for a real-world problem (e.g., medical diagnosis) and perform inference using conditional probabilities.
- 7. Implement a Hidden Markov Model for sequence prediction (e.g., weather prediction or speech recognition).
- 8. Simulate a Kalman Filter for a tracking or navigation problem (e.g., predicting object positions over time).
- 9. Implement basic belief functions and apply Dempster-Shafer theory for uncertainty modeling in a decision-making problem.
- 10. Develop a model to predict stock price movements using historical data.

Lecture Periods: 0	Tutorial Periods: 0	Practical Periods:30	Total Periods:30
Deference Pooks			

#### Reference Books

- Cherry Bhargava," Artificial Intelligence Fundamentals and Applications", 1<sup>st</sup> Edition, CRC Press,2021.
- 2. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", 4th Edition, Pearson, 2020.
- 3. Elaine Rich, Kevin Knight and Shivashankar B. Nair, "Artificial Intelligence", 3<sup>rd</sup> Edition, McGraw Hill Educations, 2017.
- 4. Chris Thornton, Benedict Du Boulay," Artificial Intelligence through Search",4th Edition, Springer Netherlands,2012.
- S.Rajasekaran, G.A.Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms synthesis and applications", 15th Edition, PHI Learning Private Limited, 2011

#### Web References

- 1. https://www.tutorialspoint.com/artificial\_intelligence/index.html
- 2. https://www.javatpoint.com/artificial-intelligence-ai
- 3. https://www.geeksforgeeks.org/artificial-intelligence/

Co's		Program Outcomes (POs)												m nes	Specific (PSOs)
	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	2	2	-	0 -	1 -,	2	-	177	2	3	3	2
2	3	3	3	3	2	-	-	-	2	-	-	2	3	3	3
3	3	3	3	3	2	- 1	-	-	2	-	-	2	3	3	3
4	3	3	3	3	2	-	-	-	2		-	2	3	3	3
5	3	2	3	2	2	-	-	T- 1	2	<del>.</del>	-	2	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

# **Evaluation Method**

	Co	ontinuous	Assessn	nent Marks (CA	M)		
Assessment	Performar cl	nce in prac	tical	Model		End Semester Examination	Total Marks
	Conduction of practical	Record work	viva	Practical Examination	Attendance	(ESE) Marks	
*	1 I L 1	a mark					p -
Marks	15	5	5	15	10	50	100

	Compute	er Science and Engineering	Programn			TE	ad Camaata	er Exam Typ	e TF
Semester	V		Course C	- 7	-			mum Marks	
Course Code	U23CST	C07	Period			Credit		ESE	TM
	514 11818	gar S	L	Т	Р	С	CAM		100
Course Name	WEB DE	SIGNING	3	0	0	3	25	75	100
		(Commo	n to CSE and A	I&DS)					
Prerequisite	Basic kn	owledge in Programming and Da	itabase						
Troroquiono	On cor	npletion of the course, the stud	dents will be ab	ole to				BT Ma (Highest	
								(Highest	
0	CO1	Interpret the concepts of HTML	and CSS in cre	eating a	and des	igning web p	age	K	
Course Outcomes	CO2	Apply client-side programming Interpret the concepts of PHP t	using Javascrip to include forms	and p	ocess t	he form data	in web	K	2
Gutoomoo	CO3	pages	Harris T. Maria					.,	
	CO4	Apply PHP scripts to handle an	nd manipulate da	atabas	es			∣ K	
	CO5	Apply the web hosting procedu	ires to host a we	eb app	lication				J
UNIT - I	Web Ba	sics, Html and CSS				Periods:0			T
Veb Basics: The	Internet -	World wide web - DNS - URI	and URL – HTT	ΓP – w	eb clie	nt and web s	erver. Intro	duction to	
									CO.
orms. Introduct	ion to CSS	: CSS Syntax – Location of St	yies – Selector	5 - D	OX IVIOU	ici Toxt o	.,9		
ositioning Elem	Javascr	rint				Periods:0			
		. Willes Operators [	Data Types – Fi	unction	ıs – Ob	jects – Strin	g Methods	- Number	000
Anthods - Array	s – Arrav I	Methods - Conditions - Loops	- Popup Aleit	<ul><li>Ever</li></ul>	nts – E	vent Listener	. JavaScrip	ot Objects:	CO2
Object Definition	s – Obiect F	Properties -Object Methods- Object	ect Display.			Periods:0			I
UNIT - III	Introdu	ction to PHP and Forms	F-b- / Drint (	Inorot	ore: Arit			- Logical -	Ī
		les – Data Types – Constants – Switch – Loops – Arrays – Fund							CO3
String – IfElse	Elselt – S ing Rootsta	rp – Form Validation – Form Rec	guired – Form S	ubmis	sion. Da	ita: Date and	Time - File	e Upload -	003
Cookies – Sessi	ns – Includ	e – Exceptions.	1						
LIMIT IV	DHP wit	th Database Connectivity				Periods:0			
		til Databass sommer,							T
Introduction to D	atabase: Es	" LOOL Creating a MySOI	L Database – C	reating	a New	Table – Putt	ing Data in	to the New	
Database - Acc	essing the [	ssential SQL – Creating a MySQI Database in PHP – Updating Dat	L Database – C tabases – Inser	reating ting Ne	a New ew Data	Table – Putt Items into a	ing Data in Database	to the New – Deleting	CO4
Database - Acc	essing the [	ssential SQL – Creating a MySQI Database in PHP – Updating Dat	L Database – Ci tabases – Inser	reating ting Ne	a New ew Data	i items into e	Dutabass	to the New  — Deleting	CO4
Database – Acc Records – Sortir	essing the Ing the Ing the Data.	ssential SQL – Creating a MySQI Database in PHP – Updating Dat	tabases – inser			Periods:0	9		CO2
Database – Accords – Sortin	essing the I og the Data.  Web Ho	ssential SQL – Creating a MySQI Database in PHP – Updating Dat Disting	ing on the site	- Sen		Periods:0	9 ess other v	websites -	
Database – Accords – Sortin  UNIT - V  Introduction to N  Registering dom	essing the I og the Data.  Web Howard Hosting ains – Then	ssential SQL – Creating a MySQI Database in PHP – Updating Dat	ing on the site	- Sen	ding er	Periods:0	9	websites -	
Database – Accords – Sortin  UNIT - V  Introduction to \ Registering dom  Lecture Periods	essing the I g the Data.  Web Ho Web Hosting ains – Then s:45	ssential SQL – Creating a MySQI Database in PHP – Updating Dat  osting g: Creating the website – Work nes Publishing web sites – Mainta	ing on the site aining a website	– Sen	ding er	Periods:0	9 ess other v	websites –	
Database – Accords – Sortin  UNIT - V  Introduction to \ Registering dom  Lecture Periods  Text Books	essing the I or the Data.  Web Ho Web Hosting ains – Then s:45	ssential SQL – Creating a MySQI Database in PHP – Updating Database in PHP	ing on the site aining a website Practica	- Sen	ding er	Periods:0	9 ess other v	websites –	
Database – Accords – Sortin  UNIT - V  Introduction to \ Registering dom  Lecture Periods  Text Books  1. Randy Coni	essing the I g the Data.  Web Ho Web Hosting ains – Then s:45	psential SQL – Creating a MySQI Database in PHP – Updating Database in PHP	ing on the site aining a website Practica  eb Developmen	– Sene.  al Periot", Pea	ding er	Periods:0 nail and acc	9 ess other v	websites –	
Database – Accords – Sortin  UNIT - V  Introduction to N Registering dom Lecture Periods Text Books  1. Randy Cont 2. Steven Holz 3. Jon Dukett,	essing the I g the Data.  Web Ho Web Hosting ains – Then s:45  holly and Ri gner, "PHP:	ssential SQL – Creating a MySQI Database in PHP – Updating Dat  osting g: Creating the website – Work nes Publishing web sites – Mainta	ing on the site aining a website Practica  eb Developmen	– Sene.  al Periot", Pea	ding er	Periods:0 nail and acc	9 ess other v	websites –	
Database – Accords – Sortin  UNIT - V  Introduction to \ Registering dom  Lecture Periods  Text Books  1. Randy Coni 2. Steven Holz 3. Jon Dukets	essing the I g the Data.  Web Ho Web Hosting ains – Then s:45  molly and Ri ener, "PHP: "JavaScript	ssential SQL – Creating a MySQI Database in PHP – Updating Database in PHP	ing on the site aining a website Practica eb Developmen raw Hill Education and Web Develor	– Sen	ding er ods: 0  rson Ec Edition, ', Paper	Periods:0 nail and acc ducation Inc, 2020. back, 2018.	9 ess other v Total Per	websites – riods:45	СО
Database – Acceleration of North Vintroduction to Negistering dom Lecture Periods Text Books  1. Randy Control Steven Hold Steven Hold Steven Books  3. Jon Dukett, Reference Books	essing the I g the Data.  Web Ho Web Hosting ains – Then s:45  molly and Ri ener, "PHP: "JavaScript ks	pating g: Creating the website – Workings Publishing web sites – Mainta  Tutorial Periods: 0  Cardo Hoar, "Fundamentals of Working Cardo Hoar, "Fundamentals of Working and JQuery: Interactive Front-E	ing on the site aining a website  Practical Pr	- Sen	ding er ods: 0  rson Ec Edition, , Paper	Periods:0 nail and acc ducation Inc, 2020. back, 2018.	9 ess other v  Total Per  3 <sup>rd</sup> Edition,	websites – riods:45 2022.	со
Database – Acc Records – Sortin UNIT - V Introduction to N Registering dom Lecture Periods Text Books 1. Randy Coni 2. Steven Holz 3. Jon Dukett, Reference Boo 1. Lyza Dange 2. Nixon Robi	web Hosting ains – Then s:45  molly and Righter, "PHP: "JavaScript ks er Gardner, n, "Learning	psential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP, MySQL & JavaScript: With Database in PHP, MySQL & JavaScript & JavaScript: With Database in PHP, MySQL & JavaScript & JavaScr	ing on the site aining a website  Practica  eb Developmen aw Hill Education Web Developmen Hardware for Web Developmen Practical Web Developmen i Query, CSS & Levas eript Web"	– Senet.  al Perioti, Peacon, 3rd pment	ding er  ods: 0  rson Ec  Edition, , Paper  velopers 5", O'R  Publica	Periods:0 nail and acc ducation Inc, 2020. back, 2018. s'', Dream tec eilly Media, { tions 1st Edit	9 ess other v Total Per 3 <sup>rd</sup> Edition, th Press,1 <sup>st</sup> 5 <sup>th</sup> Edition, 2	websites – riods:45 2022. Edition, 20	со
Database – Accellence – Accellence – Sortin UNIT - V Introduction to National Registering dom Lecture Periods Text Books  1. Randy Conication 2. Steven Holz 3. Jon Dukett, Reference Booch 1. Lyza Dange 2. Nixon Robin Records	web Hosting ains – Then s:45  molly and Righter, "PHP: "JavaScript ks er Gardner, n, "Learning	psential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP, MySQL & JavaScript: With Database in PHP, MySQL & JavaScript & JavaScript: With Database in PHP, MySQL & JavaScript & JavaScr	ing on the site aining a website  Practica  eb Developmen aw Hill Education Web Developmen Hardware for Web Developmen Practical Web Developmen i Query, CSS & Levas eript Web"	– Senet.  al Perioti, Peacon, 3rd pment	ding er  ods: 0  rson Ec  Edition, , Paper  velopers 5", O'R  Publica	Periods:0 nail and acc ducation Inc, 2020. back, 2018. s'', Dream tec eilly Media, { tions 1st Edit	9 ess other v Total Per 3 <sup>rd</sup> Edition, th Press,1 <sup>st</sup> 5 <sup>th</sup> Edition, 2	websites – riods:45 2022. Edition, 20	СО
Database – Accellence – Accellence – Sortin UNIT - V Introduction to Negistering dom Lecture Periods Text Books  1. Randy Conial Steven Holz 3. Jon Dukett, Reference Boom 1. Lyza Danger 2. Nixon Robim 3. Laura Leman 4. Alex Libby,	web Hosting ains – Then s:45  molly and Richard, "PHP: "JavaScript ks er Gardner, "Learning ay, Rafe Co Gaurav Gu	ssential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP, MySQL & JavaScript: With Iburn, "Mastering HTML, CSS & Cpta, Asoj Talesra, "Responsive W	ing on the site aining a website  Practical  eb Development aw Hill Education Web Development Hardware for Web Development Grand Web Development Web Web Design with	- Sen	ding er  ods: 0  rson Ec  Edition, ', Paper  velopers 5", O'R  Publica 5 and C	Periods:0 mail and acc ducation Inc, 2020. back, 2018. st, Dream tec eilly Media, stons, 1st Edit	9 ess other v Total Per 3rd Edition, ch Press,1st 5th Edition, 2 ion, 2016. als", Packt	websites – riods:45 2022. Edition, 20 2018. Publishing,	СО
Database – Acc Records – Sortin UNIT - V Introduction to Nate of the Control Registering dom Lecture Periods Text Books 1. Randy Control 2. Steven Holz 3. Jon Dukett, Reference Boot 1. Lyza Dange 2. Nixon Robit 3. Laura Lema 4. Alex Libby,	web Hosting ains – Then s:45  molly and Richard, "PHP: "JavaScript ks er Gardner, "Learning ay, Rafe Co Gaurav Gu	psential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP, MySQL & JavaScript: With Database in PHP, MySQL & JavaScript & JavaScript: With Database in PHP, MySQL & JavaScript & JavaScr	ing on the site aining a website  Practical  eb Development aw Hill Education Web Development Hardware for Web Development Grand Web Development Web Web Design with	- Sen	ding er  ods: 0  rson Ec  Edition, ', Paper  velopers 5", O'R  Publica 5 and C	Periods:0 mail and acc ducation Inc, 2020. back, 2018. st, Dream tec eilly Media, stons, 1st Edit	9 ess other v Total Per 3rd Edition, ch Press,1st 5th Edition, 2 ion, 2016. als", Packt	websites – riods:45 2022. Edition, 20 2018. Publishing,	СО
Database – Acce Records – Sortin  UNIT - V  Introduction to \ Registering dom  Lecture Periods  Text Books  1. Randy Coni 2. Steven Holz 3. Jon Dukett, Reference Boo  1. Lyza Dange 2. Nixon Robi 3. Laura Lema 4. Alex Libby, 2nd Edition, 5. Bassett, Lin	web Hosting ains – Then s:45  molly and Richard "PHP: "JavaScript ks er Gardner, ", "Learning ay, Rafe Co Gaurav Gu 2016. ndsay, "Intro	ssential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP, MySQL & JavaScript: With Iburn, "Mastering HTML, CSS & Cpta, Asoj Talesra, "Responsive W	ing on the site aining a website  Practical  eb Development aw Hill Education Web Development Hardware for Web Development Grand Web Development Web Web Design with	- Sen	ding er  ods: 0  rson Ec  Edition, ', Paper  velopers 5", O'R  Publica 5 and C	Periods:0 mail and acc ducation Inc, 2020. back, 2018. st, Dream tec eilly Media, stons, 1st Edit	9 ess other v Total Per 3rd Edition, ch Press,1st 5th Edition, 2 ion, 2016. als", Packt	websites – riods:45 2022. Edition, 20 2018. Publishing,	СО
Database – Acce Records – Sortin  UNIT - V  Introduction to \ Registering dom  Lecture Periods  Text Books  1. Randy Coni 2. Steven Holz 3. Jon Dukett, Reference Boo  1. Lyza Dange 2. Nixon Robi 3. Laura Lema 4. Alex Libby, 2nd Edition, 5. Bassett, Lin  Web Reference	web Ho  Web Ho  Web Hosting ains – Then  S:45  molly and Ric mor, "PHP: "JavaScript ks er Gardner, n, "Learning ay, Rafe Co Gaurav Gu 2016. ndsay, "Intro	ssential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP, MySQL & JavaScript: With Iburn, "Mastering HTML, CSS & Control of Con	ing on the site aining a website  Practical  eb Development aw Hill Education Web Development Hardware for Web Development Grand Web Development Web Web Design with	- Sen	ding er  ods: 0  rson Ec  Edition, ', Paper  velopers 5", O'R  Publica 5 and C	Periods:0 mail and acc ducation Inc, 2020. back, 2018. st, Dream tec eilly Media, stons, 1st Edit	9 ess other v Total Per 3rd Edition, ch Press,1st 5th Edition, 2 ion, 2016. als", Packt	websites – riods:45 2022. Edition, 20 2018. Publishing,	СО
Database – Acce Records – Sortin  UNIT - V  Introduction to V Registering dom Lecture Periods  Text Books  1. Randy Cont 2. Steven Holz 3. Jon Dukett, Reference Boo 1. Lyza Dange 2. Nixon Robit 3. Laura Lema 4. Alex Libby, 2nd Edition, 5. Bassett, Lin  Web Reference  1. https://deve	web Hosting ains – Then s:45  molly and Richard PHP: "JavaScript ks er Gardner, n, "Learning ay, Rafe Co Gaurav Gu 2016. Indsay, "Intro	posting g: Creating the website — Workings Publishing web sites — Mainta Tutorial Periods: 0  Cardo Hoar, "Fundamentals of Working Tutorial Periods: 0  Cardo Hoar, "Fundamentals of Working The Complete Reference", McGrand JQuery: Interactive Front—E  "Java Script on Things: Hacking The Php, MySQL & JavaScript: With Iburn, "Mastering HTML, CSS & Copta, Asoj Talesra, "Responsive Word The Complete Reference", McGrand The Complete Reference The Coptage Responsive Word Responsive Word Responsive Word Responsive Respo	ing on the site aining a website  Practica  eb Developmen aw Hill Education Web Developmen Hardware for Web Javascript Web" Web Design with ation: a to-the-position with the site of the	- Senet.  al Periodor, Peacon, 3rd pment.  Teb Dev. HTML.  HTML bint gui	ding er ods: 0  rson Ec Edition, ', Paper velopers .5", O'R Publica 5 and C	Periods:0 nail and acc ducation Inc, 2020. back, 2018. s", Dream tec eilly Media, 5 tions, 1st Edit SS3 Essenti	9 ess other v Total Per 3rd Edition, ch Press,1st 5th Edition, 2 ion, 2016. als", Packt	websites – riods:45 2022. Edition, 20 2018. Publishing,	СО
Database – Acce Records – Sortin  UNIT - V  Introduction to \ Registering dom  Lecture Periods  Text Books  1. Randy Coni 2. Steven Holz 3. Jon Dukett, Reference Boo  1. Lyza Dange 2. Nixon Robi 3. Laura Lema 4. Alex Libby, 2nd Edition, 5. Bassett, Lin  Web Reference  1. https://www. 2. https://www. 3. https://www. 4. Alex Libby. 4. Alex Libby, 4. Alex Libby, 5. Bassett, Lin  Web Reference  1. https://www. 4. https://www. 5. https://www. 6. h	web Hosting ains – Then s:45  molly and Richard, "PHP: "JavaScript ks er Gardner, ", "Learning ay, Rafe Co. Gaurav Gu. 2016. andsay, "Introduces es eloper.mozilly webselonger.	ssential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP in Indiana Script on Things: Hacking IpHP, MySQL & JavaScript: With Iburn, "Mastering HTML, CSS & Copta, Asoj Talesra, "Responsive Word of the JavaScript object notabase in Indiana Script of Indiana Script object notabase in Indiana Scrip	ing on the site aining a website  Practical Pr	- Senet.  al Periodor, Peacon, 3rd pment.  Teb Dev. HTML.  HTML bint gui	ding er ods: 0  rson Ec Edition, ', Paper velopers .5", O'R Publica 5 and C	Periods:0 nail and acc ducation Inc, 2020. back, 2018. s", Dream tec eilly Media, 5 tions, 1st Edit SS3 Essenti	9 ess other v Total Per 3rd Edition, ch Press,1st 5th Edition, 2 ion, 2016. als", Packt	websites – riods:45 2022. Edition, 20 2018. Publishing,	СО
Database – Acce Records – Sortin  UNIT - V  Introduction to \ Registering dom  Lecture Periods  Text Books  1. Randy Coni 2. Steven Holz 3. Jon Dukett, Reference Boo  1. Lyza Dange 2. Nixon Robi 3. Laura Lema 4. Alex Libby, 2nd Edition, 5. Bassett, Lin  Web Reference  1. https://deve 2. https://www 3. https://www 4. https://alist	essing the I g the Data.  Web Ho Web Hosting ains – Then s:45  molly and Ric rner, "PHP: "JavaScript ks er Gardner, n, "Learning ay, Rafe Co Gaurav Gu 2016. ndsay, "Intro es eloper.mozill r.w3schools r.smashingr apart.com/a	ssential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP in Indiana	ing on the site aining a website  Practical Pr	- Senet.  al Periodor, Peacon, 3rd pment.  Teb Dev. HTML.  HTML bint gui	ding er ods: 0  rson Ec Edition, ', Paper velopers .5", O'R Publica 5 and C	Periods:0 nail and acc ducation Inc, 2020. back, 2018. s", Dream tec eilly Media, 5 tions, 1st Edit SS3 Essenti	9 ess other v Total Per 3rd Edition, ch Press,1st 5th Edition, 2 ion, 2016. als", Packt	websites – riods:45 2022. Edition, 20 2018. Publishing,	СО
Database – Acce Records – Sortin  UNIT - V  Introduction to \ Registering dom  Lecture Periods  Text Books  1. Randy Coni 2. Steven Holz 3. Jon Dukett, Reference Boo 1. Lyza Dange 2. Nixon Robi 3. Laura Lema 4. Alex Libby, 2nd Edition, 5. Bassett, Lin  Web Reference 1. https://deve 2. https://www 4. https://alist.	essing the I g the Data.  Web Ho Web Hosting ains – Then s:45  molly and Ric rner, "PHP: "JavaScript ks er Gardner, n, "Learning ay, Rafe Co Gaurav Gu 2016. ndsay, "Intro es eloper.mozill v.w3schools v.smashingr apart.com/a	ssential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP in Indiana	ing on the site aining a website  Practical Pr	- Senet.  al Periodor, Peacon, 3rd pment.  Teb Dev. HTML.  HTML bint gui	ding er ods: 0  rson Ec Edition, ', Paper velopers .5", O'R Publica 5 and C	Periods:0 nail and acc ducation Inc, 2020. back, 2018. s", Dream tec eilly Media, 5 tions, 1st Edit SS3 Essenti	9 ess other v Total Per 3rd Edition, ch Press,1st 5th Edition, 2 ion, 2016. als", Packt	websites – riods:45 2022. Edition, 20 2018. Publishing,	СО
Database – Acce Records – Sortir  UNIT - V  Introduction to \ Registering dom  Lecture Periods  Text Books  1. Randy Coni 2. Steven Holz 3. Jon Dukett, Reference Boo  1. Lyza Dange 2. Nixon Robii 3. Laura Lema 4. Alex Libby, 2nd Edition, 5. Bassett, Lir  Web Reference  1. https://deve 2. https://www 4. https://alist 5. https://css- 6. https://www	essing the I g the Data.  Web Ho Web Hosting ains – Then s:45  molly and Ric zner, "PHP: "JavaScript ks er Gardner, n, "Learning ay, Rafe Co Gaurav Gu 2016. ndsay, "Intro es eloper.mozill v.w3schools v.smashingr apart.com/a tricks.com/ts v.tutorialspo	ssential SQL – Creating a MySQI Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP – Updating Database in PHP in Indiana	ing on the site aining a website  Practical Pr	- Senet.  al Periodor, Peacon, 3rd pment.  Teb Dev. HTML.  HTML bint gui	ding er ods: 0  rson Ec Edition, ', Paper velopers .5", O'R Publica 5 and C	Periods:0 nail and acc ducation Inc, 2020. back, 2018. s", Dream tec eilly Media, 5 tions, 1st Edit SS3 Essenti	9 ess other v Total Per 3rd Edition, ch Press,1st 5th Edition, 2 ion, 2016. als", Packt	websites – riods:45 2022. Edition, 20 2018. Publishing,	CO4

COs	8.2		Te J		Prog	ram C	Outcor	nes (l	POs)					ram Spo omes (F	
	P01	PO2	PO3	PO4	PO5	P06	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	-	3	-	2	-	-	137 (81	2	14/10/2	2	2	-	1	2
2	3	-	3	1	2	-	-	-		- N - 110		_	T	1	2
3	2	-	3	-	2	1	-	1	Day Brill	Cayle 6	1 1	e op		1	2
4	2	-	3	2	2	2	-	2	-	-	-	-	-	1	2
5	2	-	3	1	-	1	- /1-	2	_			-	-	1	2

# Correlation Level: 1 - Low, 2 - Medium, 3 - High Evaluation Method

		Cor	ntinuous Asses	sment Marks (C	AM)	End	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Comp	uter Science and Engineering	Tech.		O From Type: LE					
Semester	V		Course	Catego	ry: <b>PC</b>	End	Semester E	nester Exam Type: <b>LE</b>		
Course Code		SPC06	Periods	Week		Credit	Maxim	mum Marks		
Course Code	02300	31 000	L	Т	Р	С	CAM	ESE	TM	
Course Name	WEB	DESIGNING LABORATORY	0	0	2	1	50	50	100	
		(CSE	and AI&D	S)						
Prerequisite	Basic	knowledge in Programming and D	atabase		- 1					
	On co	mpletion of the course, the stu	dents wil	be abl	e to			BT Ma (Highes		
0	CO1	Construct and display webpage wit	ith HTML and CSS elements					K3		
Course	CO2	Develop JavaScript programming f	or website	creation				K3		
Outcomes	CO3	Build PHP Forms						K3		
	CO4	Develop Database Connectivity us	y using PHP					K3		
	CO5	Utilize PHP applications for Web h	osting					K3		

**List of Exercises** 

- 1. (a) Design a home page which displays information about your college department using headings, HTML entities and paragraphs.
  - (b) Create a webpage for any clinic using marquee and HTML formatting tags.
- 2. Design a timetable and display it in tabular format.
- 3. Design an admission form for any course in your college with text, password fields, drop-down list, check-boxes, radio buttons, submit and reset button etc.
- 4. Design a web page of your home town with an attractive background color, text color, an image, font face by using Inline CSS formatting.
- 5. (a) Design a web page by using different CSS border styles.
  - (b) Demonstrate the use of CSS Box Model.
- 6. Write a JavaScript program to remove a character at the specified position of a given string and return the new
- 7. Develop and demonstrate a HTML file that includes JavaScript script for taking a number n as input using prompt and display first n Fibonacci numbers in a paragraph.
- 8. Design HTML form for keeping student record, apply JavaScript validation in it for restriction of mandatory fields, numeric field, email-address field, specific value in a field etc.
- 9. Write a program in PHP for processing a simple form (use controls like checkbox, radio buttons and options).
- 10. Write a program in PHP for a simple POST and GET functions
- 11. Design a login form using cookies, bootstrap, PHP, Database.
- 12. Design a student form with add, update, delete, display all and search option using student database.

12. Design a stu	dent forn	n with add, update, delete, d	display all and search option	using student database.
Lecture Periods:	0	Tutorial Periods:0	Practical Periods:30	Total Periods:30
Reference Books		Iller Corint on Thing	c: Hacking Hardware for \	Web Developers". Dreamtech Press,

- 1. Lyza Danger Gardner, "Java Script on Things: Hacking Hardware for Web Developers", Dreamtech Press, 1st Edition, 2018.
- 2. Laura Lemay, Rafe Colburn, "Mastering HTML, CSS and Javascript Web", BPB Publications, 1st edition, 2016.
- 3. Keith Wald, Jason Lengstorf, "Pro PHP and jQuery", Paperback, 2016.
- Steven Suehring, Janet Valade, "PHP, MySQL, JavaScript & HTML5 All-in-One", John Wiley and Sons Inc, 2013.
- Leon Atkinson," Core PHP Programming: Using PHP to Build Dynamic Web Sites", Paperback, 2000.

# Web References

- https://www.w3schools.com/php/DEFAULT.asp
- https://www.tutorialspoint.com/php/index.html
- https://www.phptpoint.com/php-tutorial/
- https://www.javatpoint.com/php-tutorial
- https://www.w3schools.com/html/default.asp

COs				nes (P				1,810					Progra Outco	mes (PS	Specific Os)
	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	3	3	3	3	3	- 1	2	3	THE ST	3	3	3
2	3	3	3	3	-	3	-	3	-	2	-	2	2	2	-
3	2	2	2	2	2	2	3	3	-	3	3	-	2	2	2
4	2	2	2	2	2	2	-	3	-	3		3	3	3	-
5	3	3	3	3	3	3	3	3	V 2/1=	3	3	3	3	3	3

Correlation Level: 1-Low, 2-Medium, 3-High

**Evaluation Method** 

	Co	ontinuous	Assessr	ment Marks (CA	M)		
Assessment	Performar c	nce in prac	tical	Model		End Semester Examination	Total Marks
	Conduction of practical	Record work	viva	Practical Examination	Attendance	(ESE) Marks	l Ne not
Marks	15	5	5	15	10	50	100

Department		ter S	cience and Engineering			me: <b>B.Tech</b>				
Semester	VI	1270				ategory: PE		mester E		
Course Code	U23CS	E614			Perioc	ls/Week	Credit		aximum N	
				L	T	P	C	CAM	ESE	TM
Course Name	SERVE	R-SII	DE SCRIPTING LANGUAGES CSE	3	0	0	3	25	75	100
Prerequisite	Δ hasi	c unc	erstanding of Client-Server Arch		re & w	hat a weh se	rver is			
Frerequisite			tion of the course, the student				1 101 10.			Mapping est Leve
	CO1	Und	erstand the basics of scripting langu	ages.						K2
Course	CO2	Exp	eriment about scripting with respecti	ve to r	eactive	web Pages				K3
Outcomes	CO3	·	elop the basic functionality using Pe							К3
	CO4	Rep	hrase the basic functionality using R	uby so	cripting.					K2
	CO5	Infe	ence the in-depth knowledge of pro	gramm	ing fea	tures of Angul	ar JS	e X er i - <sup>2</sup> - 1		K4
UNIT - I	Introd	uctio	n to scripts and scripting lang	uage	S		Perio	ds:09	4	
Objects- Predefi UNIT - II JavaScript progr	ned objec  JavaS  ramming	ts, Accript	es, Data Types, Operators, Co ccessing objects, Object Methods for reactive web pages element active web pages elements: Java	s. I <b>ts</b> aScrip	ot Eve	nts- Mouse e	Perio	ds:09	7	CO2
Form events, wir	ndow ever	nts, E	vent handlers, Frames, Form obj	ject, J	avaSc	ript Form Va	lidation			002
UNIT - III	PEAR							ds:09		
•			, Operators, Conditional stateme d regular expression operators.	nts, L	oops,	Arrays, String	gs, Hash	es, Lists,	Built-in	CO3
UNIT - IV	RUBY						Perio	ds:09		<u> </u>
Data types, Va Hashes, File I/0	riables, O O, Ruby F	perat orm l	ors, Conditional statements, Loop nandling.	os, Me	ethods	, Blocks, Mod	dules, Arr	ays, Strii	ngs,	CO4
UNIT - V	Angul	arJS					Perio	ds:09		•
	ne Way I		nment, Expressions in AngularJ ng, Two Way Binding, AngularJS							CO5
Lecture Periods		T	Tutorial Periods: 0	Pra	actical	Periods: 0	To	otal Peri	ods:45	L
Text Books		1								
David Flanaga     O'Reilly Publi			: The Definitive Guide: Master th			ost-Used Pro				

- 2. O'Reilly, "Learning PHP, MySQL, JavaScript, CSS & HTML5: A Step-by-Step Guide to Creating Dynamic Websites", 3rd Edition, O'Reilly Publications, 2014.
- 3. Tom Christiansen, Brian D Foy, Larry Wall, Jon Orwant," Programming Perl", 4th Edition, O'Reilly Media, 2012.
- 4. David Barron, "The World of Scripting Languages", 1st Edition, Wiley Publications, 2009.

#### Reference Books

- 1. Russ Ferguson, Christian Heilmann, "Beginning JavaScript with Dom scripting and AJAX", 2<sup>nd</sup> Edition, Apress, 2013.
- 2. David Flanagan and Yukihiro Matsumoto, "The Ruby Programming Language", 1st Edition, O'Reilly Publications, 2008.
- 3. J. Lee, B. Ware, "OpenSource Web Development with LAMP using Linux Apache, MySQL, Perl and PHP", 1st Edition, Pearson Education, 2003.

#### Web References

- 1. https://www.ruby-lang.org/en/
- 2. https://www.geeksforgeeks.org/ruby-programming-language/
- 3. https://www.javatpoint.com/perl-tutorial
- 4. https://www.tutorialspoint.com/perl/index.htm
- https://www.perl.org/learn.html
- 6. https://www.w3schools.com/angular/
  - \* TE Theory Exam, LE Lab Exam

COs					Pro	ogram	Outco	mes (P	Os)					gram Spacomes (I	
<b>CO</b> 3	PO1	PO2	PO3	PO4	PO5	P06	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	2	D.	1	-	-		- 1	-	-	-	-	2	-	/=:
2	2	2	3	F _	-	-	- '	-	-	r region	47 <u>-</u>	-	2	11.	-
3	2	2	3	2	-	-	-		-	-	-	-	2	-	-
4	2	2	-	-	-	-	-	-	-	-	-	_	2	-	-
5	2	3	3	-	-	1		114		1 !	-	-	2		-

# Correlation Level: 1 - Low, 2 - Medium, 3 - High Evaluation Methods

		Cor	ntinuous Asses	sment Marks (C	AM)	End	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examinati on (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Computer Science and Engineering	Program						. TC
Semester	V/VIII	Course	Catego	ry: PE	·•····································		Exam Type	
		Perio	ds/Wee	ek	Credit		imum Mark	
Course Code	U23CSEC02	L	Т	Р	С	CAM	ESE	TM
Course Name	Introduction to Industry 4.0	3	0	0	3	25	75	100
	(Common to	CSE and Me	chatroni	cs)				
Prerequisite	NIL						BT Map	nina
	On completion of the course, the stu	ıdents will	be abl	e to			(Highest	
							K1	••••
Course							K2	
Outcomes	CO2 Explore advanced technologies						K3	
	CO3 Comprehend the working of Clo						K2	
	CO4 Learn how AR/VR improves Ind	ustrial Auto	mation	and S	whoreocurity		K3	
	CO5 Apply design thinking and explo	re IIO I USE	Cases	and C	ypersecurity.			ods:0
UNIT - I	Foundations Of Industry 4.0 and Smustry 4.0 - The Fourth Industrial Revolution - Glo	- b-li-ation c	nd Ema	raina Iss	sues Lean Pro	duction Svs	tems - Smart	CO
							troduction to	CO
oT (Industrial Inte	rnet of Things) - FI IVI Machine and 3D Filliuli	g Demonsu	ation c	acc cto	idies in Industi	y 4.0.		ods:0
	Vay Tachnologies and Advanced Af	anvsis in i	แนนธน	y 4.U				
0 D: D-1	ensors - Collaborative Platforms and Product Advanced Analytics - Introduction to Robotics	5 - IIIII Oducii		(V3 (DIC	,,,,,,	-Efficient Te	echnologies -	CO2
.0 - Big Data and	ote (Cobote) - Artificial Infelligence and Dala A	Halytics for i	Toulouv	Civianii	enance.			ods:0
	Claud Computing Technologies and	industriai	Applic	ations	1			
ntroduction to Clo	oud Technologies - Top Cloud Service Providend Fog Computing - Hybrid Cloud Solutions - Computing - Hybrid Cloud - Hybrid Cloud Solutions - Computing - Hybrid Cloud Solutions - Computing - Hybrid Cloud Solutions - Hybrid Cloud Solution	ers - Cloud	Comput	ing in Ir a Platfo	ndustry 4.0 -A. orms - Cloud S	ecurity - Clo	oud Solutions	CO3
Services - Edge ar	nd Fog Computing - Hybrid Cloud Solutions - C	Jiouu-Dasec	Dig Da	a i latio	11110 01044 0			
or Smart Cities.	Augmented Reality (AR), Virtual Rea	ality (VR),	and Inc	lustria	I		Peri	ods:(
UNIT - IV	I o TT					-1 1	otion Mixor	4
		es of AR and	d VR - A	R/VR it	n Maintenance by and Training	e and inspe g - Challend	ges in AR/VF	CO4
ntroduction to AR		mes - vr ioi		ai oaioi	ly all a literature.			
Reality (MR) and	t and VR in Industry 4.0 - Industrial Use Case Digital Twins - Automation Tools and Technic	1000						
Reality (MR) and Adoption.	Digital Twins - Automation Tools and Techniq	udies						
Reality (MR) and Adoption.  UNIT - V	Design Thinking, IIOT, and Case Stu	udies	- Decian	for Indi	ustrial Applicat	ions - Basic	s of Industria	ıl
Reality (MR) and Adoption.  UNIT - V  Introduction to Design (Mark)	Digital Twins - Automation Tools and Technic  Design Thinking, IIOT, and Case Stussign Thinking - Design Thinking Process - Humbrial Processes and Automation - Cybersecur	udies nan-Centered rity in Indust	- Decian	for Indi	ustrial Applicat ne Use Case	ions - Basic s - Drones	s of Industria and UAVs i	ıl
Reality (MR) and Adoption.  UNIT - V  Introduction to Desiry - Industry - UAV Resirted in the Real Production to Desired industry - UAV Resirted in the Resirt	Digital Twins - Automation Tools and Technic  Design Thinking, IIOT, and Case Stusies Thinking - Design Thinking Process - Humber and Processes and Automation - Cybersecure gulations and Safety Standards - Future of Inc	udies an-Centered ity in Indust dustry 4.0.	- Decian	for Indu Real-tir	ustrial Applicat ne Use Case	ions - Basic	s of Industria and UAVs i	ıl
Reality (MR) and Adoption.  UNIT - V  Introduction to Desion (IIoT) - Industindustry - UAV Retecture Periods	Digital Twins - Automation Tools and Technic  Design Thinking, IIOT, and Case Stusies Thinking - Design Thinking Process - Humber and Processes and Automation - Cybersecure gulations and Safety Standards - Future of Inc	udies an-Centered ity in Indust dustry 4.0.	d Desigr ry 4.0 -	for Indu Real-tir	ustrial Applicat ne Use Case	ions - Basic s - Drones	s of Industria and UAVs i	ods:0
Reality (MR) and Adoption.  UNIT - V  ntroduction to Desor (IIoT) - Industrictly - UAV Resort Lecture Periods  Text Books	Design Thinking, IIOT, and Case Stusien Thinking - Design Thinking Process - Humber and Processes and Automation - Cybersecure and Safety Standards - Future of Inces:45  Tutorial Periods: 0	udies nan-Centered ity in Industidustry 4.0. Praction	d Desigr ry 4.0 -	for Indu Real-tir ods: 0	ustrial Applicat me Use Case	ions - Basic s - Drones	s of Industria and UAVs i	ı
Reality (MR) and Adoption.  UNIT - V  ntroduction to Desor (IIoT) - Industrictly - UAV Resort Books  1. Ravi Kant, He	Design Thinking, IIOT, and Case Stusien Thinking - Design Thinking Process - Humber and Processes and Automation - Cybersecure and Safety Standards - Future of Incesses Tutorial Periods: 0  Tutorial Periods: 0  Temporary 4.0: The Industrial Internet of Industrial Internet of The Industrial Internet of Industrial Internet Industrial Internet Industrial Internet Industrial In	udies nan-Centeree rity in Indust dustry 4.0. Praction res and Systemings", Apres	d Design ry 4.0 - cal Peri ems", C	for Indu Real-tir ods: 0	ustrial Applicat me Use Case:	ions - Basic s - Drones	s of Industria and UAVs i	ıl
Reality (MR) and Adoption.  UNIT - V Introduction to Desirate of (IIoT) - Industrictly - UAV Resecture Periods  Text Books  1. Ravi Kant, He	Design Thinking, IIOT, and Case Stusien Thinking - Design Thinking Process - Humber and Processes and Automation - Cybersecure and Safety Standards - Future of Incesses Tutorial Periods: 0  Tutorial Periods: 0  Temporary 4.0: The Industrial Internet of Industrial Internet of The Industrial Internet of Industrial Internet Industrial Internet Industrial Internet Industrial In	udies nan-Centeree rity in Indust dustry 4.0. Praction res and Systemings", Apres	d Design ry 4.0 - cal Peri ems", C	for Indu Real-tir ods: 0	ustrial Applicat me Use Case:	ions - Basic s - Drones	s of Industria and UAVs i	ıl
Reality (MR) and Adoption.  UNIT - V  Introduction to Desirate of (IIoT) - Industrict of the Industry - UAV Reserved Feet Books  Reserved Reserved Feet Books  Reference Books	Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humber III Processes and Automation - Cybersecure Equilations and Safety Standards - Future of Inces:45 Tutorial Periods: 0  Tutorial Periods: 0  Tutorial Periods: 0  The Industry 4.0: Concepts, Process Prist, "Industry 4.0: The Industrial Internet of The III Periods: 0  The Industry 4.0: Managing The III Periods: 0	udies nan-Centeree rity in Indust dustry 4.0. Praction res and Systemings", Apres	d Design ry 4.0 - cal Peri ems", C	for Indu Real-tir ods: 0	ustrial Applicat me Use Case:	ions - Basic s - Drones	s of Industria and UAVs i	ıl
Reality (MR) and Adoption.  UNIT - V  Introduction to Desort (IIoT) - Industry - UAV Recture Periods  Text Books  Revi Kant, He  Alasdair Gilch  Emre Cevikca  Reference Boo	Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humber III Processes and Automation - Cybersecure Equilations and Safety Standards - Future of Inces:45 Tutorial Periods: 0  Tema Gurung, "Industry 4.0: Concepts, Process Prist, "Industry 4.0: The Industrial Internet of The Industrial Internet of The Industry 4.0: Managing The Iks	udies nan-Centered ity in Indust dustry 4.0. Praction ies and System ings", Apre- ie Digital Tran	d Desigr ry 4.0 - cal Peri ems", C ss,2016.	for Indu Real-tir ods: 0	ustrial Applicat me Use Case: ss,2023.	ions - Basic s - Drones Total Peri	s of Industria and UAVs in ods:45	CO:
Reality (MR) and Adoption.  UNIT - V  Introduction to Decot (IIoT) - Industry - UAV Recture Periods  Ext Books  I. Ravi Kant, Hectary Called Single Cevil Ce	Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humber and Processes and Automation - Cybersecure agulations and Safety Standards - Future of Inces:45 Tutorial Periods: 0  Tutorial Periods: 0  Tutorial Periods: 0  The Industry 4.0: Concepts, Process and Alp Ustundag, "Industry 4.0: Managing The Inces:48  The Industry 4.0: Managing The Indust	udies nan-Centered ity in Indust dustry 4.0. Praction  ees and Syst hings", Apre- ee Digital Trans	d Desigr ry 4.0 - cal Peri ems", C ss,2016. nsformat	for Indu Real-tin ods: 0 RC Prestion", Sp	ustrial Applicatme Use Cases ss,2023. prniger,2017.	ions - Basic s - Drones Total Peri	s of Industria and UAVs in ods:45	CO
Reality (MR) and Adoption.  UNIT - V  Introduction to Desort (IIoT) - Industry - UAV Recture Periods  Ext Books  Reality (MR) and Adoption to Desort (IIoT) - Industry - UAV Recture Periods  Ext Books  Rayi Kant, He  Alasdair Gilch  Emre Cevikca  Reference Boo  Soumya Das  Abhinav Shapublishers, 20	Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humber III Processes and Automation - Cybersecure Englations and Safety Standards - Future of Inces:45  Tutorial Periods: 0  Tutorial Periods: 0  The Industry 4.0: Concepts, Process Incest, "Industry 4.0: The Industrial Internet of The Industrial Internet of The Industry 4.0: Managing The III Standards - II	udies nan-Centerer ity in Indust dustry 4.0. Practic res and Syst nings", Apre- e Digital Trai	d Design ry 4.0 - cal Peri ems", C ss,2016. nsformat	for Indu Real-tir ods: 0 RC Presition", Sp	ustrial Application Use Case: ss,2023. prniger,2017. and Best Practices.	ions - Basic s - Drones Total Peri	s of Industria and UAVs in ods:45  Industry 4.0	CO:
Reality (MR) and Adoption.  UNIT - V  Introduction to Desor (IIoT) - Industry - UAV Recture Periods  Text Books  1. Ravi Kant, He 2. Alasdair Gilch 3. Emre Cevikca Reference Boo 1. Soumya Das 2. Abhinav Shapublishers, 20 3. Anand Nayya 4. Dominik T. N	Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humbrial Processes and Automation - Cybersecure and Safety Standards - Future of Inces:45 Tutorial Periods: 0  Tutorial Periods: 0  Tutorial Periods: 0  The Industry 4.0: Concepts, Process and Alp Ustundag, "Industry 4.0: Managing Theman, Alp Ustundag, "Industry 4.0: Managing Theman, Arpit Jain, Paawan Sharma, Mohend 1023.  The Matt, Vladimír Modrák, Helmut Zsifkovits, Industry Vladimír Modrák, Helmut Zsifkovits, Industry Indu	udies nan-Centeredity in Industry 4.0. Praction res and Systemings", Aprese Digital Transport Roy, "Resizons for Incestry 4.0 for Stry	d Design ry 4.0 - cal Peri ems", C ss,2016. nsformat	for Indu Real-tir ods: 0 RC Prestion", Sp Trends	ustrial Applicate me Use Cases as s., 2023.  prniger, 2017.  and Best Pradern Business, es, Opportunit	ions - Basic s - Drones Total Peri- actices in , Springer,2 ties and Re	s of Industria and UAVs in ods:45  Industry 4.0 023. quirements,	CO:
Reality (MR) and Adoption.  UNIT - V  ntroduction to Decot (IIoT) - Industry - UAV Recture Periods  Text Books  1. Ravi Kant, He 2. Alasdair Gilch 3. Emre Cevikca Reference Boo 1. Soumya Das 2. Abhinav Shapublishers, 20 3. Anand Nayya 4. Dominik T. N	Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humbrial Processes and Automation - Cybersecure and Safety Standards - Future of Inces:45 Tutorial Periods: 0  Tutorial Periods: 0  Tutorial Periods: 0  The Industry 4.0: Concepts, Process and Alp Ustundag, "Industry 4.0: Managing Theman, Alp Ustundag, "Industry 4.0: Managing Theman, Arpit Jain, Paawan Sharma, Mohend 1023.  The Matt, Vladimír Modrák, Helmut Zsifkovits, Industry Vladimír Modrák, Helmut Zsifkovits, Industry Indu	udies nan-Centeredity in Industry 4.0. Praction res and Systemings", Aprese Digital Transport Roy, "Resizons for Incestry 4.0 for Stry	d Design ry 4.0 - cal Peri ems", C ss,2016. nsformat	for Indu Real-tir ods: 0 RC Prestion", Sp Trends	ustrial Applicate me Use Cases as s., 2023.  prniger, 2017.  and Best Pradern Business, es, Opportunit	ions - Basic s - Drones Total Peri- actices in , Springer,2 ties and Re	s of Industria and UAVs in ods:45  Industry 4.0 023. quirements,	CO:
Reality (MR) and Adoption.  UNIT - V  Introduction to Desponding the Adoption of the Adoption	Digital Twins - Automation Tools and Technic    Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humbrial Processes and Automation - Cybersecure gulations and Safety Standards - Future of Inces:45   Tutorial Periods: 0    Tutorial Periods: 0	udies Itan-Centered Ity in Indust Idustry 4.0. Practic Ites and System Item Roy, "Reserved For Incompany 1.0 for Stry 4.0 for Stry 4.0 for Stry A.0	d Design ry 4.0 - cal Peri ems", C ss,2016. nsformat	for Indu Real-tir ods: 0 RC Prestion", Sp Trends	ustrial Applicate me Use Cases as s., 2023.  prniger, 2017.  and Best Pradern Business, es, Opportunit	ions - Basic s - Drones Total Peri- actices in , Springer,2 ties and Re	s of Industria and UAVs in ods:45  Industry 4.0 023. quirements,	CO:
Reality (MR) and Adoption.  UNIT - V  Introduction to Desort (IIoT) - Industry - UAV Recture Periods  Text Books  1. Ravi Kant, He 2. Alasdair Gilch 3. Emre Cevikca Reference Boo 1. Soumya Das 2. Abhinav Shapublishers, 20 3. Anand Nayya 4. Dominik T. Macmilla, 202 5. Bruno S. Seand the Futu	Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humbrial Processes and Automation - Cybersecure egulations and Safety Standards - Future of Inces:45  Tutorial Periods: 0  Tutorial Periods: 0  The Industry 4.0: Concepts, Process and Alp Ustundag, "Industry 4.0: Managing Them Industry udies Itan-Centered Ity in Indust Idustry 4.0. Practic Ites and System Item Roy, "Reserved For Incompany 1.0 for Stry 4.0 for Stry 4.0 for Stry A.0	d Design ry 4.0 - cal Peri ems", C ss,2016. nsformat	for Indu Real-tir ods: 0 RC Prestion", Sp Trends	ustrial Applicate me Use Cases as s., 2023.  prniger, 2017.  and Best Pradern Business, es, Opportunit	ions - Basic s - Drones Total Peri- actices in , Springer,2 ties and Re	s of Industria and UAVs in ods:45  Industry 4.0 023. quirements,	CO:	
Reality (MR) and Adoption.  UNIT - V  Introduction to Design of (IIoT) - Industing - UAV Restrated in the Extra Books  Restrated in the Extra Books  Reference Boots  Soumya Dass  Abhinav Share Cevikos  Reference Boots  Anand Nayya  Anand Nayya  Bruno S. Segand the Future Books  Web Reference  Macmilla,202  Anand Restrated in the Future Books  Reference Books  Anand Nayya  Macmilla,202  Reference Books  Macmilla,202  Macmilla,202  Macmilla,202  Macmilla,202  Macmilla,202  Macmilla,202	Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humbrial Processes and Automation - Cybersecure gulations and Safety Standards - Future of Inces:45 Tutorial Periods: 0  Tema Gurung, "Industry 4.0: Concepts, Process Prist, "Industry 4.0: The Industrial Internet of The Industrial Internet of The Industry 4.0: Managing The Industry 4.0: Managin	udies Itan-Centered Ity in Indust dustry 4.0. Practic Ites and System Practic Ites and System Practic Ites and System Practic Ites and System Practic Ites and System Practic Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Item	d Design ry 4.0 - cal Peri ems", C ss,2016. nsformat ecent T lustry 4.4 SMEs: C	for Indu Real-tir Iods: 0 RC Prestion", Sp Trends O in Mood	ustrial Applicate me Use Cases as s., 2023.  prniger, 2017.  and Best Pradern Business, es, Opportunit	ions - Basic s - Drones Total Peri- actices in , Springer,2 ties and Re	s of Industria and UAVs in ods:45  Industry 4.0 023. quirements,	CO:
Reality (MR) and Adoption.  UNIT - V  ntroduction to Desort (IIoT) - Indust ndustry - UAV Relecture Period: Text Books  1. Ravi Kant, He 2. Alasdair Gilch 3. Emre Cevikca Reference Boo 1. Soumya Das 2. Abhinav Shapublishers, 20 3. Anand Nayya 4. Dominik T. Macmilla, 202 5. Bruno S. Seand the Futu  Web Reference 1. https://o	Design Thinking, IIOT, and Case Stusign Thinking - Design Thinking Process - Humbrial Processes and Automation - Cybersecure egulations and Safety Standards - Future of Inces:45  Tutorial Periods: 0  Tutorial Periods: 0  The Industry 4.0: Concepts, Process and Alp Ustundag, "Industry 4.0: Managing Them Industry udies Itan-Centered Ity in Indust dustry 4.0. Practic Ites and System Practic Ites and System Practic Ites and System Practic Ites and System Practic Ites and System Practic Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Ites and System Item	d Design ry 4.0 - cal Peri ems", C ss,2016. nsformat ecent T lustry 4.4 SMEs: C	for Indu Real-tir Iods: 0 RC Prestion", Sp Trends O in Mood	ustrial Applicate me Use Cases as s., 2023.  prniger, 2017.  and Best Pradern Business, es, Opportunit	ions - Basic s - Drones Total Peri- actices in , Springer,2 ties and Re	s of Industria and UAVs in ods:45  Industry 4.0 023. quirements,	CO:	

COs	l mu				Pro	gram	Outcor	nes (P	Os)				1	gram Spo comes (F	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	3	3	2	2	2	-	-	2	-		2	2	2	2
2	2	3	3	3	2	3	-	-	2	-		2	2	2	2
3	3	3	2	3	2	- 3	-	-	2	-	T RULL	2	3	2	3
4	2	2	2	3	2	3	-	-	2	2	-	2	2	2	2
5	2	2	3	3	2	2		e Itali	2	2	out Tuesa	2	2	3	3

# Correlation Level: 1 - Low, 2 - Medium, 3 - High Evaluation Methods

Assessment	Continuous Assessment Marks (CAM)					End	
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus