

Department of Computer Engineering



Scheme and Syllabus 7th & 8th Semester

BATCH: 2020-24 | CREDITS: 175 | (2018 Scheme)

Academic Year 2023-24



Scheme and Syllabus BATCH: 2020-24 CREDITS: 175 (2018 Scheme)

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INSTITUTION

Vision

To emerge as an institute of eminence in the fields of engineering, technology and management in serving the industry and the nation by empowering students with a high degree of technical, managerial and practical competence.

Mission

To strengthen the theoretical, practical and ethical dimensions of the learning process by fostering aculture of research and innovation among faculty members and students.

To encourage long-term interaction between the academia and industry through their involvement in the design of curriculum and its hands-on implementation.

To strengthen and mould students in professional, ethical, social and environmental dimensions by encouraging participation in co-curricular and extracurricular activities.

To develop value based socially responsible professionals for the betterment of the society

Quality Policy

To provide educational services of the highest quality both curricular and co-curricular to enable students integrate skills and serve the industry and society equally well at global level.

Values

- ✤ Academic Freedom
- Innovation
- Integrity

- Professionalism
- ✤ Inclusiveness
- Social Responsibility

DEPARTMENT OF COMPUTER ENGINEERING

Vision

To produce engineers, researchers and technologists with managerial skills of highest competence who would be able to solve the challenges of society.

Mission

To impart high quality professional training, practical experience and value education in the Computer Engineering.

To pursue creative research in Computer Engineering in order to serve the engineering community and society.

To prepare and encourage a student for Lifelong learning to meet career and ethical challenges through active participation in co-curricular and extracurricular activities.

Program Educational Objectives (PEOs)

PEO1:	To prepare globally competent graduates having strong fundamentals of Computer Engineering domain knowledge, updated with modern technology to provide effective solutions for engineering problems.
PEO2:	To acuminate graduates with ability to adapt and develop projects towards the latest technological era of the Computing and IT sector with a high degree of innovative ideas.
PEO3:	To produce committed and motivated graduates with research attitude, investigative approach, and multidisciplinary thinking for implementation of strategic tasks.
PEO 4:	To shape the graduates with strong managerial and communication skills to work and learn continuously and effectively as individuals as well as in teams.

PEO to Mission Statement Mapping

Mission Statements	PEO1	PEO2	PEO3	PEO4
To impart high quality professional training, practical experience and value education in the Computer Engineering.	3	2	2	2
To pursue creative research in Computer Engineering in order to serve the engineering community and society.	3	2	2	2
To prepare and encourage a student for Lifelong learning to meetcareer and ethical challenges through active participation in co- curricular and extracurricular activities.	2	2	3	3

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

Program Outcomes (POs) with Graduate Attributes

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, Engineering fundamentals, and an Engineering specialization to the solution of complex Engineering problems in Computer Engineering.
PO2	Problem analysis: Identify, formulate, review research literature, and analyze complex Engineering problems in Computer Engineering 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 of Computer Engineering 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 in Computer Engineering, 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 in Computer Engineering 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 in Computer Engineering.
PO7	Environment and Sustainability: Understand the impact of the professional Engineering solutions of Computer Engineering 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 Skills: 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 Specific Outcomes (PSOs)

A graduate of the Computer Engineering Program will demonstrate

PSO1: The ability to apply the knowledge of core science, engineering mathematics and engineering fundamentals to design and develop the computing systems.

PSO2: The ability to provide effective and efficient real time solutions to problems in computerengineering using acquired knowledge in various domains.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO1	3	3	3	2	3	-	-	-	3	-	3	-
PEO2	3	3	3	2	3	-	-	-	3	-	3	-
PEO3	3	3	3	2	3	-	-	-	3	-	3	-
PEO4	3	3	3	2	3	-	-	-	3	-	3	-

Mapping of POs with PEOs

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

DEPARTMENT OF COMPUTER ENGINEERING

							Marks					
S.	Course Code Course B		BOS	Cre	dit Di	stribu	tion	Overall	Contact	CIE	SEE	
No				L	Т	Р	S	Credits	Hours	0112	~==	TOTAL
1	20CEE71A	Internet of Things	CEE	3	0	0	0	3	3	50	50	100
2	20CEE72A	Software Testing	CEE	3	0	0	0	3	3	50	50	100
3	20CEE73XA	Professional Elective-V	CEE	3	0	0	0	3	3	50	50	100
4	20CEE74XA	Professional Elective-VI	CEE	3	0	0	0	3	3	50	50	100
5	20CEL75A	Internet of Things Lab	CEE	0	0	2	0	2	4	25	25	50
6	20CEL76A	Software Testing Lab	CEE	0	0	2	0	2	4	25	25	50
7	20CEE77A	Project Phase-1	CEE	0	0	3	0	3	-	50	50	100
8	20NHOPxx	Open Elective	CEE	3	0	0	0	3	3	50	50	100
	Total						22	23	350	350	700	

SEVENTH SEMESTER-SCHEME

Pro	ofessional Elective Courses-V	Professional Elective Course- VI				
20CEE731A	Distributed Computing	20CEE741A	Software Quality Assurance			
20CEE732A	Cyber Security	20CEE742A	Penetration Testing			
20CEE733A	Advanced Microprocessor	20CEE743A	Biometrics Systems			
20CEE734A	Data Acquisition and Productization	20CEE744A	HDL-Based Digital Systems Design			

DEPARTMENT OF COMPUTER ENGINEERING

										Marl	KS	
SI.	Course Code	Course	BOS	Credit Distribution			Overall	Contact				
No				L	Т	Р	S	Credits	Hours	CIE	SEE	Total
1	20CEE81A	Computer Vision	CEE	3	0	0	0	3	3	50	50	100
2	20CEE82A	Internship Viva	CEE	0	0	4	0	4	-	50	50	100
3	20CEE83A	Project Phase 2	CEE	0	0	12	0	12	-	100	100	200
	Total							19	3	200	200	400

EIGTH SEMESTER-SCHEME

Open Elective

Course Code	Course	BOS
20NHOP701	Big Data Analytics using HP Vertica- 1	CSE
20NHOP702	VM Ware Virtualization Essentials-1	ISE
20NHOP704	Big Data Analytics using HP Vertica – 2	CSE
20NHOP707	SAP	ME
20NHOP708	Schneider - Industrial Automation	EEE
20NHOP709	CISCO - Routing & Switching - 1	ECE
20NHOP712	CISCO - Routing & Switching -2	ECE
20NHOP714	Blockchain	CSE
20NHOP715	Product Life Cycle Management	ME
20NHOP720A	Robotic Process Automation	CSE
20NH0P721A	Industry 4.0	ME
20NHOP722A	Programming of Industrial Robot	ECE
20NHOP723A	5G Communication	ECE
20NHOP725A	VLSI Physical Design-I	ECE
20NHOP726A	VLSI Physical Design-2	ECE
20NHOP727A	Juniper Network Operating System	ECE
20NHOP728A	Database Administration using DB2	AI&ML

SEMESTER VII

(SYLLABUS)

					IN	TERN	ET O	F THI	NGS					
Course Code	20CE	EE71	Α							larks		50		
L:T:P:S	3:0:0):0							SEE N	Marks		50		
Hrs / Week	3								Tota	l Marks		100		
Credits	03								Exan	n Hours		03		
Course outcom At the end of t		ırse,	the st	tudent	will be	e able t	:0:							
20CEE71A.1	Unde	ersta	nd Io	T conc	epts, u	nderly	ing tec	hnologi	es and	migratio	on of M2	M to IoT		
20CEE71A.2	Unde	nderstand the M2M fundamentals and data manag								nent				
20CEE71A.3	Analy	yze t	he va	rious f	eature	s of Io'	Г stand	ard pro	tocols	and plat	forms			
20CEE71A.4	Imple	eme	nt pro	ograms	s using	Raspb	erry pi	model						
20CEE71A.5	Unde	ersta	nd th	e inter	face co	ncepts	s with r	network	s					
20CEE71A.6	Desig	gn ar	nd dev	velop r	eal wo	rld IoT	applic	ation u	sing sy	vstem lik	e Raspb	erry pi.		
Mapping of Co	ourse	Out	come	es to P	rogra	m Out	comes	s and P	rogra	m Speci	fic Out	comes:		
	P011	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PSO2
20CEE71A.1	3	3	2	2	3	2	1	1	2	1	2	2	2	2
20CEE71A.2	3	3	2	2	3	2	1	1	2	1	2	1	2	2
20CEE71A.3	3	3	2	2	3	2	1	1	2	1	2	2	2	2
20CEE71A.4	3	2	2	2	2	2	1	1	2	1	2	1	1	1
20CEE71A.5	2	3	2	2	3	2	1	1	2	1	2	2	2	2
20CEE71A.6	3	3	2	2	2	2	1	1	2	1	2	2	1	1
MODULE-1							TO IOT				0CEE7 1			ours
Evolution of Int and Alternative IoT, -IoT and Di	IoT m	odel.	s – Sii - Conv	mplifie vergen	d ÎoT A ce of IT	Archite ' and Ic	cture a oT – IoT	nd Core '' Challe	e IoT Fi nges	unctiona				
Self-study								T, IoT (hallen	iges				
Text Book MODULE-2	M2M	ΙΛΝ			1: 1.2,			MENT/	15	2	0CEE7 1	14.2	0 H	ours
													-	
Devices and ga Service (XaaS),									nt, Con	inecting	Smart U	DJECTS, E	verytnin	g as a
Text Book	Text	Bool	k 1: 2	.2. 2.4.	2.6 to	2.9								
MODULE-3					ND PL		RMS			20CEE71A.3 9 Hours				ours
6LowPAN, Wi-f	i, Bluet	tootl	h, CO	AP, MQ	QTT, Zi	gbee A	rchitec	ture, Lo	oRaWA	AN, Platfo	orms: Co	mponen	ts of Mid	crosoft
Azure	1													
Self-study						Azure	using v	various	open-	source p	olatform	IS.		
Text Book	Text	Bool	k 2: 3	.1, 3.3,	3.9									
MODULE-4	ΙΟΤ	' PR	OGR	AMMI	NG						OCEE71 OCEE71		9 H	ours
Introduction to Connecting with													k conne	ctivity,
Applications	Intef	acin	<u>g of</u> F	Raspbe	erry PI	mode	ls with	variou	s sens	ors				
Text Book	Text	Bool	k 3: 4	.1, 6.3,	6.5, 6.	7, Tex	t Book	2:10.1	, 10.3					
MODULE-5 Use of Big Date				NS OF tion in		Indust	ry 4.0 d	concept	s, We		OCEE7 1 ed Const			<mark>ours</mark> Role of
Machine Learn LED, Using a PI											Using an	n RPi to (Control a	n RGB
Self-study /	Roal	time	a imn	lomon	tation	ofPac	nhorm	7 Di / A	rduire	o using P	rotous	or any o	non cour	rco
Case Study /	softw		-	iemen	lation	UI Kas	pperry	/ FI / A	uuiii	o using P	i oteus (or any 0	pen sou	ice
Applications														
Text Book	Text	Rool	к 2:4	.5 to 6.	1									

	ssessment Patte		Marks Distrib	
I	RBT Levels	Test (s)	Qualitative Assessmen (s)	
		25	15	10
L1	Remember	-	-	-
L2	Understand	10	-	5
L3	Apply	5	10	5
L4	Analyze	5	5	-
L5	Evaluate	5	-	-
L6	Create	-	-	-
SEE A	ssessment Patte	· · ·		
		-	Marks	
	RBT Levels		bution	
L1	Remember	(5	0)	
L1 L2	Understand	2	0	
L3	Apply		0	
L4	Analyze	-	0	
L5	Evaluate		0	

Create **Text Books:**

L6

- 1. Maciej Kranz,"Building the Internet of Things: Implement New Business Models, Disrupt Competitors, Transform Your Industry",1st Edition,Wiley,2021 ISBN-10 1119285666
- 2. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton (Author), Jerome Henry,"IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things "1st Edition,Cisco Press,2021 ISBN-10 1587144565
- 3. Colin Dow, "Internet of Things Programming Projects: Build modern IoT solutions with the Raspberry Pi 3 and Python", 1st edition, Packt Publishing, 2018 ISBN-10 1789134803

Reference Books:

- 1. Qinghao Tang (Author), Fan Du,"Internet of Things Security: Principles and Practice", 1st edition,Springer,2021 ISBN-13 978-9811599415
- 2. Chandrasekar Vuppalapati, "Building Enterprise IoT Applications", 1st Edition, Academic Press, 2019 ISBN-10 0367173859
- 3. Peter Waher, "Mastering Internet of Things: Design and create your own IoT applications using Raspberry Pi 3", First Edition, Packt Publishing, 2018 ISBN-13 978-1788397483
- 4. Abdulrahman Yarali, "IoT: Platforms, Connectivity, Applications and Services ",Nova Science Publishers Inc , April 2018 ISBN-10 1536134007

Web links and Video Lectures (e-Resources):

- https://www.raspberrypi.org/
- https://projects.raspberrypi.org/en/projects/raspberry-pi-getting-started/3
- https://www.raspberrypi.com/software •

- **Quizzes & Assignments**
- Visit to any IoT device industries •
- Demonstration of interfacing latest IoT devices
- Video demonstration of latest trends in IoT's
- Contents related activities (Activity-based discussions)
 - For active participation of students, instruct the students to prepare interfacing programs
 - Organizing Group wise discussions on issues
 - Seminars

Course Code	20C	EE72	A						CIE	Marks		50		
L:T:P:S	3:0:	0:0							SEE	Marks		50		
Hrs / Week	3								Tota	l Marks		10	0	
Credits	03								Exar	n Hours		03	3	
Course outcon	nes:													
At the end of t	the cou	urse,	the st	udent	will be	able to	D:							
20CEE72A.1	Desc	cribe	the fu	Indam	entals	of softv	ware te	sting.						
20CEE72A.2	Illus	ustrate the limitation of testing process												
20CEE72A.3	Anal	yse t	he de	sign of	test ca	ases for	r differ	ent test	ting teo	chniques				
20CEE72A.4	Deve	elop t	est st	rategi	es and	plans, o	deign t	est cas	e, prioi	ritize and	d execute	e them.		
20CEE72A.5	Solv	e the	prob	lem of	proces	s fram	ework.							
20CEE72A.6	Crea	ite ap	prop	riate d	ocume	nt for t	he soft	ware a	rtefact					
Mapping of Co	ourse	Outo	come	s to P	rograi	m Out	comes	and P	rogra	m Speci	ific Out	comes:		
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO1	PSO
20CEE72A.1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
20CEE72A.2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
20CEE72A.3	3	2	2	2	-	-	-	-	-	-	-	-	2	3
20CEE72A.4	3	2	2	2	-	-	-	-	-	-	-	-	2	3
20CEE72A.5	3	2	2	2	-	-	-	-	-	-	-	-	2	3
20CEE72A.6	3	2	-	-	-	-	-	-	-	-	-	-	2	3
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test selection techniques, Test case prioritization and selective execution. Levels of Testing, Integration Testing: Traditional view of testing levels, Alternative life-cycle models, The SATM system, Separating integration and system testing, A closer look at the SATM system.

Self-study Survey on sample test case studies of the same.

Text Book Text Book 2, Text Book 3

CIE Assessment Pattern (50 Marks - Theory) -

		N	larks Distributio	n
F	RBT Levels	T Levels Test (s)		MCQ's
		25	15	10
L1	Remember	5	-	-
L2	Understand	5	7.5	5
L3	Apply	10	7.5	5
L4	Analyze	5	-	-
L5	Evaluate	-	-	-
L6	Create	-	-	-

SEE Assessment Pattern (50 Marks - Theory)

	RBT Levels	Exam Marks Distribution (50)
L1	Remember	10
L2	Understand	10
L3	Apply	20
L4	Analyze	10
L5	Evaluate	-
L6	Create	-

Text Books:

- 1. Paul C. Jorgensen: Software Testing, A Craftsman's Approach, 3rd Edition, Auerbach Publications, 2008, ISBN 0849374758, 9780849374753.
- Mauro Pezze, Michal Young: Software Testing and Analysis Process, Principles and Techniques, Wiley India, 2009, ISBN-13 978-0-471-45593-6.
- 3. Aditya P Mathur: Foundations of Software Testing, Pearson Education 2008, ISBN 8131707954, 9788131707951.

Reference Books:

- 4. Software testing Principles and Practices Gopalaswamy Ramesh, Srinivasan Desikan, 2 nd Edition, Pearson, 2007, ISBN-13 978-8177581218
- 5. Software Testing Ron Patton, 2nd edition, Pearson Education, 2004, 0672327988, 9780672327988.
- The Craft of Software Testing Brian Marrick, Pearson Education, 1994, ISBN-10 0131774115, ISBN-13 978-0131774117.
- 7. Anirban Basu, Software Quality Assurance, Testing and Metrics, June 2015, ISBN-10 8120350685, ISBN-13 978-8120350687.

Web links and Video Lectures (e-Resources):

<u>https://onlinecourses.nptel.ac.in/noc22_cs61/preview</u>

- Quizzes & Assignments
- Visit to any manufacturing/aero/auto industry or any power plant
- Video demonstration of latest trends in web design
- Contents related activities (Activity-based discussions)
 - For active participation of students, instruct the students to prepare Flowcharts and Handouts
 - > Organizing Group wise discussions on issues
 - Seminars

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20CEE731A.3	2	2	1	3	3	-	-	-	3	2	1	1	2	1
20CEE731A.4	1	2	2	3	1	-	-	-	3	3	2	1	1	1
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Servi	ces						
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CIE A	CIE Assessment Pattern (50 Marks - Theory) -						
		Μ	larks Distributio	n			
]	RBT Levels	Test (s)	Qualitative Assessment	MCQ's			
		25	<u>(s)</u> 15	10			
L1	Remember	r 5	-	-			
L2	Understan	d 5	7.5	5			
L3	Apply	10	7.5	5			
L4	Analyze	5	-	-			
L5	Evaluate	-	-	-			
L6	Create	-	-	-			

	RBT Levels	Exam Marks Distribution (50)
L1	Remember	10
L2	Understand	10
L3	Apply	20
L4	Analyze	10
L5	Evaluate	-
L6	Create	-

Suggested Learning Resources:

Text Books:

- 1. Kshemkalyani Ajay D, Mukesh Singhal, "Distributed Computing: Principles, Algorithms and Systems", Cambridge Press, 2011. ISBN-10 0521189845
- George Coulouris, Jean Dollimore, Time Kindberg, "Distributed Systems Concepts and Design", 2. Fifth Edition, Pearson Education, 2012 ISBN 10: 0-13-214301-1

Reference Books:

- 1. Pradeep L Sinha, "Distributed Operating Systems: Concepts and Design", Prentice Hall of India, 2007 ISBN-10 0780311191
- 2. Tanenbaum A S, Van Steen M, "Distributed Systems: Principles and Paradigms", Pearson Education, 2007, ISBN-10 153028175X
- 3. Arshdeep Bahga, Vijay Madisetti, "Cloud Computing: A Hands-On Approach", Universities Press, 2014 ISBN-10 0996025502

Web links and Video Lectures (e-Resources):

- https://onlinecourses.nptel.ac.in/noc22 cs80/preview
- https://onlinecourses.nptel.ac.in/noc23 cs72/preview
- https://ocw.mit.edu/courses/6-824-distributed-computer-systems-engineering-spring-2006/

- Quizzes & Assignments
- Visit to any manufacturing/ IT industry where the deployment of distributed systems is done
- Video demonstration of latest trends in distributed systems
- Contents related activities (Activity-based discussions)
 - For active participation of students, instruct the students to prepare Flowcharts and Handouts
 - Organizing Group wise discussions on issues
 - Seminars

Course Code	200	EE732	2A			CYBE				Marks		50		
L:T:P:S	3:0:								SEE	Marks		50		
Hrs / Week	3								Tota	l Marks		100	0	
Credits	03								Exar	n Hours		03		
Course outcom														
At the end of the	ne cou	rse, th	e stu	dent w	rill be a	ble to:								
20CEE732A.1	Des	cribe t	he ba	sics of	cyber	securit	y, cybe	er-crim	e and c	yber law	7			
20CEE732A.2	Clas	ssify various types of attacks and learn the tool							ols to la	aunch th	e attack:	5.		
20CEE732A.3	Ana	alyze and Apply various tools to perform inform							matio	ı gatheri	ng.			
20CEE732A.4	App	ly intr	usion	techn	iques t	to deteo	ct intru	sion						
20CEE732A.5		-		-		techniq	-	-						
20CEE732A.6	Dev	elop se	elf-lea	arning	and re	search	skills t	o apply	the co	oncepts f	or the cy	/ber wor	ld.	
Mapping of Co	urse	Outco	mes	to Pro	ogram	Outco	omes a	nd Pro	ogram	Specifi	c Outco	mes:		
	P01	P02	PO3	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO1	PSO
20CEE732A.1	1	1	1	1	-	1	-	-	-	-	1	-	2	2
20CEE732A.2	1	3	1	3	2	1	-	-	-	-	-	-	2	1
20CEE732A.3	2	1	1	1	-	1	-	-	-	-	1	-	2	2
20CEE732A.4	3	3	2	2	2	1	-	-	-	-	-	-	2	3
20CEE732A.5	3	2	1	1	1	1	-	1	-	-	1	-	2	2
20CEE732A.6	2	2	1	-	2	-	-	-	2	-	-	-	3	2
<mark>MODULE-1</mark> Cyber Security -		RODU			_						E732A.		9 Ho	
<i>Applications</i> Text Book			Tex	t Book	1 – ch	apter 1	& 2, T			<u>ail-cases</u> hapter 1	<u>tudies.p</u>	<u>hp</u>		
MODULE-2	АТТ	ACKS	AND	COUN	ITERM	IEASUI	RES				OCEE73		9 H	ours
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Case Study/		er Seci	-								,			
Applications Text Book	Dofe	nonao	Pool	-1 Ch	apter	2								
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MODULE-3	REC	ONNA	AISSA	NCE							OCEE73		10	Hour
Harvester – Wh Servers – Social Scanning – Sca XMAS – NULL –	Engir nning IDLE	neering Meth – FIN	g Rec odolc Scan	onnais ogy – T s – Bar	ssance, Ping S 1ner Gi	; Scann weer T rabbing	iing – 1 Fechniq g and C	Port Sc Jues – DS Fing	anning Nmap er prin	S – Extro J – Netw Comma Iting Tec	acting In ork Scan nd Swit hniques	nformati nning an ches – S	d Vulnei	rabilit
Text Book						er 2 and	1 3, Ref	erence	Book 3	3 – Chapt				
MODULE-4	INTRUSION DETECTION 20CEE732A.4, 10 20CEE732A.5							Hour						
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MODULE-5	INT	RUSIC)N PF	REVEN	TION					2	OCEE73 OCEE73 OCEE73	32A.5,	71	lours
Firewalls and In				on Sys sing – I										

Text Book Re

CIE Assessment Pattern (50 Marks - Theory) -

R	BT Levels	Test (s)	Marks Distributio Qualitative Assessment (s)	on MCQ's
		25	15	10
L1	Remember	5	-	-
L2	Understand	5	7.5	5
L3	Apply	10	7.5	5
L4	Analyze	5	-	-
L5	Evaluate	-	-	-
L6	Create	-	-	-

SEE Assessment Pattern (50 Marks - Theory)

F	RBT Levels	Exam Marks Distribution (50)
L1	Remember	10
L2	Understand	10
L3	Apply	20
L4	Analyze	10
L5	Evaluate	-
L6	Create	-

Suggested Learning Resources:

Text Books:

1. Anand Shinde, "Introduction to Cyber Security Guide to the World of Cyber Security", Notion Press, 2021 ISBN-10 1637816421

2. Nina Godbole, Sunit Belapure, "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley Publishers, 201 ISBN-10: 9788126521791

3.https://owasp.org/www-project-top-ten/

Reference Books:

1. David Kim, Michael G. Solomon, "Fundamentals of Information Systems Security", Jones & Bartlett Learning Publishers, 2013 (Unit 2) ISBN-10 1284031624

2. Patrick Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made easy", Elsevier, 2011 ISBN-10 9780124116443

3. Kimberly Graves, "CEH Official Certified Ethical hacker Review Guide", Wiley Publishers, 2007 ISBN-10 8126511966

4. William Stallings, Lawrie Brown, "Computer Security Principles and Practice", Third Edition, Pearson Education, 2015 ISBN 978-0-13-377392-7

Web links and Video Lectures (e-Resources):

- https://www.youtube.com/watch?v=EKdZutMkmTE
- <u>https://www.youtube.com/watch?v=D4fYyu305jg</u>

- Quizzes & Assignments
- Visit to any manufacturing/ IT industry where the practice of Cyber Security is done
- Video demonstration of latest trends in distributed systems
- Contents related activities (Activity-based discussions)
 - > For active participation of students, instruct the students to prepare Flowcharts and Handouts
 - Organizing Group wise discussions on issues
 - Seminars

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Hrs / Week	3								Total	Marks		100		
Credits	03									Hours		03		
Course outcom														
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20CEE733A.2				ts in in	ternal	progra	mming	g mode	l of Inte	el family	of micro	process	ors.	
20CEE733A.3											s in disk			
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20CEE733A.2	2	3	-	-	-	-	-	-	-	-	-	-	2	-
20CEE733A.3	-	3	-	-	-	-	-	-	-	-	-	-	2	-
20CEE733A.4	-	-	3	-	3	-	-	3	3	3	-	3	2	-
20CEE733A.5	-	3	-	-	-	-	-	-	-	-	-	-	2	-
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Hrs / Week	3									l Marks		10		
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20CEE741A.3				d of ho	w the S	SQA cor	npone	nts can	be inte	egrated	into the j	project li	ife cycle.	
20CEE741A.4	To b	e fan	niliar	with t	he soft	ware q	uality i	infrasti	ructure	<u>.</u>				
20CEE741A.5	Asse	ess th	e qua	ality of	softwa	are pro	duct							
20CEE741A.6	App	ly the	e con	cepts in	n prepa	aring tł	ne qual	ity pla	n & doo	cuments				
Mapping of Co	urse (Outc	ome	s to Pr	ogran	n Outc	omes	and P	rograr	n Speci	fic Outc	omes:		
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20CEE741A.2	3	3	3	3	-	1	-	-	-	-	3	3	3	3
20CEE741A.3	3	3	3	3	3	-	3	-	-	3	3	3	2	2
20CEE741A.4	3	3	3	3	3	-	3	-	-	3	3	3	2	2
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MODULE-4	SOF		ARE (QUALI		FRAST	RUCT	URE			20CEE	741A.4	9 H	lours
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Documentation	contr	ol												
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MODULE-5	SOF	TWA	RE Ç	UALII	ry met	FRICS						7341A.9 7341A.6	ЧН	lours
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		N	larks Distributio	n
I	RBT Levels	Test (s)	Qualitative Assessment (s)	MCQ's
		25	15	10
L1	Remember	5	5	-
L2	Understand	5	5	5
L3	Apply	10	5	5
L4	Analyze	5	-	-
L5	Evaluate	-	-	-
L6	Create	-	-	-

SEE Assessment Pattern	(50 Marks - Theory)
bhi iissessinent i attern	100 Marins Theory

ŀ	RBT Levels	Exam Marks Distribution (50)
L1	Remember	10
L2	Understand	10
L3	Apply	20
L4	Analyze	10
L5	Evaluate	-
L6	Create	-

Suggested Learning Resources:

Text Books:

1. Daniel Galin, "Software Quality Assurance", Pearson Publication, 2009 ISBN-10 0201709457

- **Reference Books:**
 - 1. Kshirsagar Naik and Priyadarshi Tripathy, Software Testing & Quality Assurance Theory and Practice, Wiley Student edition ISBN 978-0-471-78911-6
 - 2. William E. Perry, Effective Methods for Software Testing, WILLEY, 3rd Edition. ISBN-10 8126508930
 - 3. Alan C. Gillies, "Software Quality: Theory and Management", International Thomson Computer Press, 1997 ISBN 0 412 4513 0 250

Web links and Video Lectures (e-Resources):

- <u>https://www.youtube.com/watch?v=XftNtpWjvzA&list=PLZFw7Zsba5RNK4_lyLCW2nlllMa_UpdsMZ</u>
- <u>https://www.youtube.com/watch?v=xtQpNdGK6WI</u>
- https://www.youtube.com/watch?v=LNSG-yssisA
- <u>https://builtin.com/software-engineering-perspectives/software-quality-assurance</u>

				PEN	ETRA	TION	I TES	ГING					
Course Code	20CEE742	2A						CIE	Marks		50		
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Hrs / Week	3								al Marks		100)	
Credits	03							Exa	n Hours		03		
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20CEE742A.1	Describe F	lan a	nd sco	pe of a	web s	ecurity							
20CEE742A.2	Understan	d leg	al and	compl	iance r	equire	ments	for atta	icks.				
20CEE742A.3	Perform v	ulner	ability	scann	ing and	l penet	ration	testing	using ap	propria	te tools a	and techi	niques
20CEE742A.4	Analyze th	ie per	netrati	on test	ing res	ults.							
20CEE742A.5	Write prop techniques							ns to in	plement	effectiv	e remedi	iation	
20CEE742A.6	Explore or	ı appl	licatio	ns Sess	sion Hij	acking							
Mapping of Co													
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20CEE742A.2	3 2	-	-	-	-	-	-	-	-	-	-	3	2
20CEE742A.3	3 2	-	-	-	-	-	-	-	-	-	-	3	2
20CEE742A.4	3 2	-	-	-	-	-	-	-	-	-	-	3	2
20CEE742A.5	3 -	-	-	-	-	-	-	-	-	-	-	3	2
20CEE742A.6	3 2	-	-	-	-	-	-	-	-	-	-	3	2
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I	RBT Levels	Test (s)	Qualitative Assessment (s)	MCQ's
		25	15	10
L1	Remember	5	-	-
L2	Understand	5	7.5	5
L3	Apply	10	7.5	5
L4	Analyze	5	-	-
L5	Evaluate	-	-	-
L6	Create	-	-	-

SEE Assessment Pattern (50 Marks - Theory)

F	RBT Levels	Exam Marks Distribution (50)
L1	Remember	10
L2	Understand	10
L3	Apply	20
L4	Analyze	10
L5	Evaluate	-
L6	Create	-

Suggested Learning Resources:

Text Books:

1. Penetration testing, A hands on introduction to Hacking, by Georgia Weidman San Francisco ISBN-10: 1-59327-564-1 ISBN-13: 978-1-59327-564-8

Reference Books:

- 1. Attacking Network Protocols: A Hacker's Guide to Capture, Analysis, and Exploitation ISBN-10 9781593277505
- 2. Peter Kim, "The Hacker Playbook 3: Practical Guide to Penetration Testing", Zaccheus Entertainment, 2018, ISBN-10: 1980901759
- 3. Mac OS and iOS Internals, Volume III: Security & Insecurity, 2016, ISBN-10 0991055535

Web links and Video Lectures (e-Resources):

- https://onlinecourses.nptel.ac.in/noc19_cs68/preview
- https://www.youtube.com/watch?v=IV7Sb9ZwpPk
- https://www.youtube.com/watch?v=duLjQsKfstM

Activity-Based Learning (Suggested Activities in Class)/ Practical Based learning

• Quizzes & Assignments

- Visit to any manufacturing/aero/auto industry or any power plant
- Video demonstration of latest trends in web design
- Contents related activities (Activity-based discussions)
 - > For active participation of students, instruct the students to prepare Flowcharts and Handouts
 - > Organizing Group wise discussions on issues
 - Seminars

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20CEE743A.2	Understa	nd the	e genera	al prin	ciples of	of desig	n of bi	ometri	c system	s and th	e underl	ving trac	le-offs.
20CEE743A.3	Recogniz												
	technolo	gy.	-			-	•						
20CEE743A.4	Analyze a	and ide	entify is	ssues i	n the re	ealistic	evalua	ation of	biometr	ics-base	d systen	1S.	
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		25	15	10	
L1	Remember	5	-	-	
L2	Understand	5	7.5	5	
L3	Apply	10	7.5	5	
L4	Analyze	5	-	-	
L5	Evaluate	-	-	-	
L6 Create		-	-	-	

SEE Assessment Pattern (50 Marks - Theory)

F	RBT Levels	Exam Marks Distribution (50)				
L1	Remember	10				
L2	Understand	10				
L3	Apply	20				
L4	Analyze	10				
L5	Evaluate	-				
L6	Create	-				

Suggested Learning Resources:

Text Books:

- 1. James Wayman, Anil Jain, Davide Maltoni, Dario Maio, "Biometric Systems, Technology Design and Performance Evaluation", Springer, 2005 ISBN 978-1-85233-596-0
- David D. Zhang, "Automated Biometrics: Technologies and Systems", Kluwer Academic Publishers, New Delhi, 2000 ISBN-10 0792378563
- 3. Arun A. Ross , Karthik Nandakumar, A.K.Jain, "Handbook of Multibiometrics", Springer, New Delhi, 2011, ISBN: 0387773258,9780387773254

References:

- 1. Paul Reid, "Biometrics for Network Security", Pearson Education, 2004, ISBN: 9780131015494
- 2. Nalini K Ratha, Ruud Bolle, "Automatic fingerprint Recognition System", Springer, 2003, ISBN: 0-387-95593-3
- L C Jain, I Hayashi, S B Lee, U Halici, "Intelligent Biometric Techniques in Fingerprint and Face Recognition" CRC Press, 1999, ISBN 9780849320552

Web links and Video Lectures (e-Resources):

- https://archive.nptel.ac.in/courses/106/104/106104119/
- <u>https://www.youtube.com/watch?v=1nKE7sbQKtU</u>
- https://www.youtube.com/watch?v=hv31ZESxoTQ

- Quizzes & Assignments
- Visit to any manufacturing/bio medical related industry for exploring the concept of Biometrics
- Video demonstration of latest trends and research requirements in biometrics systems
- Contents related activities (Activity-based discussions)
 - > For active participation of students, instruct the students to prepare Flowcharts and Handouts
 - > Organizing Group wise discussions on issues
 - Seminars

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20CEE744A.4	-	-	3	-	-	-	-	-	2	-	-	-	3	-
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2017, ISBN-10 9780070667242
Advanced Digital Logic Design using Verilog, State Machine & Synthesis for FPGA – Sunggu Lee, Cengage Learning, 2012, ISBN-10 9788131518489

3. Verilog HDL – Samir Palnitkar, 2nd Edition, Pearson Education, 2009, ISBN: 0-13-044911-3

4. Advanced Digital Design with Verilog HDL – Michael D. Ciletti, PHI, 2001, ISBN-10 0136019285

Web links and Video Lectures (e-Resources):

- https://archive.nptel.ac.in/courses/117/108/117108040/
- https://www.cadence.com/en_US/home/training/all-courses/82143.html
- <u>https://www.coursera.org/learn/digital-systems</u>

- Quizzes & Assignments
- Write and Demonstrate the given digital concept by writing a Verilog code.
- Contents related activities (Activity-based discussions)
 - For active participation of students, instruct the students to prepare Flowcharts and Handouts

	INTERNET OF THINGS LABORATORY								
Course Code	20CEL75A CIE Marks	25							
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Hrs / Week	3 Total Marks	50							
Credits	02 Exam Hours	03							
	utcomes: d of the course, the student will be able to:								
20CEL75A.1	$\label{eq:constraint} Understand functionalities of various single board embedded platform and the standard embedded platform of the standar$	isfundamei	undamentals						
20CEL75A.2	Understanding interfacing IoT devices with RaspberryPI/Arduino								
20CEL75A.3	Apply Raspberry PI/Arduino interfacing to creates imple application								
20CEL75A.4	Implement interfacing of various sensors with RaspberryPi/Arduin	10.							
Mapping of	Course Outcomes to Program Outcomes and Program Specific O	utcomes:							
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Exp. No. / Pgm. No.	List of Experiments / Programs	Hours	5	COs					
	Prerequisite Experiments / Programs / Demo								
	Demonstration in Proteus software								
General	Interfacing of Raspberry Pi / Arduino	2		NA					
	PART-A	-	_						
1	To interface LED with Arduino/Raspberry Pi and write a program to	3	3 20CEL75A						
2	turn ON LED for 1 sec after every 2 seconds. To interface Buzzer with Arduino/Raspberry Pi and write a program	1 2	20						
	to turn off and on periodically	3	20	CEL75A.1					
3	To interface DHT11 sensor with Arduino/Raspberry Pi and write a program to print temperature and humidity readings.	¹ 3	20CEL75A.						
4	To interface smoke sensor with Arduino/Raspberry Pi and write a	1 3	20	CEL75A.2					
	program to turn on alarm when smoke is detected.								
5	PART-B Demonstrate the connectivity of Arduino/RaspberryPi with PIF	R 3							
5	motion sensor with an application to detect obstacle and notify user using LED/LCD.		20	CEL75A.2					
6	To interface ultrasonic sensor with Arduino/Raspberry Pi and write a program to display the distance of the obstacle.	a 3	20	CEL75A.2					
7	To interface float sensor to detect water level in over head tanks and warn the overflow using Arduino/Raspberry PI with an LED	1 3	20	20CEL75A.3					
8	To interface ADXL335 accelerometer with Arduino/RaspberryPi to) 3	20	20CEL75A.3					
9	detect the various orientation and display it on serial monitor. Create an application that has three LEDs (Red, Green and white). The LEDs should follow the cycle (All Off, Red On ,Green On ,White On)for each hand movement (use Ultrasonic sensor).		20	CEL75A.4					
10	To interface soil moisture sensor to display the quality of soi moisture values using Arduino.	1 3	20	CEL75A.4					

	RBT Levels	Test (s)	Weekly A	ssessment
	RB1 Levels	15	1	L O
L1	Remember	-		-
L2	Understand	-		-
L3	Apply	5		-
L4	Analyze	-		-
L5	Evaluate	5		5
L6	Create	5		5
SEE A	ssessment Pattern	(25 Marks – La	ıb)	
	RBT Levels	Exam M Distribut		
L1	Remember	-		
L2	Understand	-		
10	Apply	05	5	
L3	Analyze			
L3 L4		15	5	
	Evaluate		-	
L4	Evaluate Create	05)	

1) Arduino Cookbook, 2nd Edition, by Michael Margolis. ISBN: 978-1785286582

2) Getting Started with Arduino: The Open-Source Electronics Prototyping Platform (Make) 3rd Edition. ISBN: 978-1774854891

3) Arduino: The complete guide to Arduino for beginners, including projects, tips, tricks, and programming, ISBN: 978-1761032806

				SO	FTW	ARE 1	ESIN	G LAE	BORA	TORY				
Course Code		20CE	L76							Marks		25		
L:T:P:S		0:0:2:	0						SEE	Marks		25		
Hrs / Week		3								al Marks		50		
Credits		02							Exar	n Hours	;	03		
Course outco At the end o			, the	studen	t will b	e able	to:							
20CEL76A.1		Analyz	e the	requir	ement	s for th	e giver	n probl	em sta	tement.				
20CEL76A.2		Design	and	implen	nent va	rious s	solutio	ns for t	he give	en proble	em.			
20CEL76A.3	A.3 Employ various design strategies for problem solving.													
20CEL76A.4 Construct control flow graphs for the solution that is implemented.														
Mapping of	Cour	se Ou	tcom	es to	Progra	am Ou	tcome	es and	Progr	am Spe	cific Out	comes:		
	P01	P02	PO3	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO1	PSO2
20CEL76A.1	2	2	-	-	-	-	-	-	-	-	-	2	3	2
20CEL76A.2	2	-	-	-	3	-	-	-	-	-	-	2	3	2
20CEL76A.3	2	-	-	-	3	-	-	-	-	-	-	2	3	2
20CEL76A.4	2	-	-	-	-	-	-	-	-	-	-	2	3	2
Dam No				Lict	ofFy	norim	onte	/ Drog	rome			Hours		COs
Pgm. No.	1		p			_		<mark>/ Prog</mark> nts / P		ms / Do	emo	nours		703
	SO	L – Da				, пурс	- muel	1.5 / 1	10510			2		NA
	04		tu Du	50			PAR	T-A						
1	inte and tria for on	egers v l dete ngle, m a tri decisi	whicl rmin isoso iangl on-ta	h are s e if t celes e at al	support the th triang 1. Der	sed to ree v le, sca ive tea	be the alues alene st case	e three repres triang s for y	e sides sent a le, or your p	Accept s of a tr in equi they c rogram s and d	iangle lateral lo not based	3	20CF	EL76A.1
2	form a triangle at all. Assume that the upper limit for the size of any side is 10. Derive test cases for your program based on boundary-value analysis, execute the test cases and discuss									3	20CE	EL76A.2		
3	sol inte and tria for of a equ	3the results.2000Design and develop a program in a language of your choice to solve the triangle problem defined as follows: Accept three integers which are supposed to be the three sides of a triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Assume that the upper limit for the size of any side is 10. Derive test cases for your program based on equivalence class partitioning, execute the test cases and discuss the results.20CEL76A											EL76A.2	
4	lan	guage	to s	olve t	the co	mmis	sion p	robler	n. An	any su alyze it ent test	from	3	20CE	EL76A.3

5 I 5 t c	execute these test cases and discuss the test results. Design, develop, code and run the program in any suitable language to solve the commission problem. Analyze it from the perspective of boundary value testing, derive different test cases, execute these test cases and discuss the test results. Design, develop, code and run the program in any suitable language to solve the commission problem. Analyze it from	3	20CEL76A.3
5 1 t c	language to solve the commission problem. Analyze it from the perspective of boundary value testing, derive different test cases, execute these test cases and discuss the test results. Design, develop, code and run the program in any suitable	3	20CEL76A.3
I			
6 1 t	the perspective of equivalence class testing, derive different test cases, execute these test cases and discuss the test results.	3	20CEL76A.4
	PART-B		
7 [1 7	Design, develop, code and run the program in any suitable language to solve the commission problem. Analyze it from the perspective of decision table-based testing, derive different test cases, execute these test cases and discuss the test results	3	20CEL76A.4
8 ¹ I	Design, develop, code and run the program in any suitable language to implement the binary search algorithm. Determine the basis path sand using them derive different test cases, execute these test cases and discuss the test results	3	20CEL76A.4
9 1 b	Design, develop, code and run the program in any suitable language to implement the quicksort algorithm. Determine the basis paths and using them derive different test cases, execute these test cases and discuss the test results.	3	20CEL76A.4
10 l 10 r	Design, develop, code and run the program in any suitable language to implement an absolute letter grading procedure, making suitable assumptions. Determine the basis paths and using them derive different test cases, execute these test cases and discuss the test results.	3	20CEL76A.4

PART-C

 Identifying the Requirements from Problem Statements
 Consider an automated banking application. The user can dial the bank from a personal computer, provide a six-digit password, and follow with a series of keyword commands that activate the banking function.

CIE As	CIE Assessment Pattern (50 Marks - Lab)										
	RBT Levels	Test (s)	Weekly Assessment								
	RB1 Levels	25	25								
L1	Remember	-	-								
L2	Understand	-	5								
L3	Apply	-	10								
L4	Analyze	-	5								
L5	Evaluate	25	5								
L6	Create	-	-								

SEE Assessment Pattern (50 Marks - Lab)

	RBT Levels	Exam Marks Distribution (50)
L1	Remember	-
L2	Understand	05
L3	Apply	15
L4	Analyze	05
L5	Evaluate	-
L6	Create	-

Suggested Learning Resources:

Reference Books: The Art of Software Testing (Book): 3rd edition, ISBN: 978-1118031964 1.

						PRO	ECT I	PHAS	SE I					
Course Code	20	OCEE	E77A			, í				Marks		50		
L:T:P:S		0:3:0								Marks		50		
Hrs / Week	-									al Marks		10	0	
Credits	03	8							Exa	m Hours		03		
Course outcor At the end of		urse,	the stu	udent v	will be a	ble to:								
20CEE77A.1					s to solv cience a				world/	Practical/	Theore	tical prob	lems inv	volving
20CEE77A.2			summ plans.	arize tl	heir wo	rk by p	roper	Softwa	are Eng	ineering D	ocumei	nts after e	valuatin	g the
20CEE77A.3	Pr	Practice presentations, Communications, and teamwork skills.												
20CEE77A.4	Ab	ole to	learn a	and dev	velop ne	ew con	cepts i	n the 1	nultidis	ciplinary a	area.			
20CEE77A.5	Us	e diff	erent l	Progra	mming	langua	ges/so	ftwar	e tools/	Hardware	techno	ologies.		
20CEE77A.6	Ap	ply a	lgorith	mic st	rategies	while	solvin	g prob	lems.					
Mapping of C	-		-		-					1 Specific	Outco	mes:		
11 0	P01			P04	P05	P06		P08		P010	P011	P012	PS01	PSO2
20CEE77A.1	3	3	2	3	-	-	-	-	-	-	-	2	3	2
20CEE77A.2	2	3	-	-	-	-	-	-	-	3	-	2	3	2
20CEE77A.3	-	-	-	-	-	-	-	3	3	3	-	2	-	-
20CEE77A.4	2	2	-	-	-	-	-	-	-	-	-	2	3	2
20CEE77A.5	2	-	-	-	3	-	-	-	-	-	-	2	3	2
20CEE77A.6	2	2	-	2	-	-	-	-	-	-	-	2	3	2
					-		RUBF							
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Problem	-	nain		ecific	Doma		spe		Domain specificDomaproblemspecificstatementthatproblemproblem				-	evant
Statement (Synopsis)	that		stater cuses	on	proble that f		statem on la							
(by nopoloj			hnolog		that focuses on latest technology in				focuses on latest					has no
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	witl			exact		are ve	-					existing		
	oute	come	s spec igned	to	too 1 specif	many		mes ave				technology		critical
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			nas cri		,	ct has	s crit	ical	specifi					
		ıking blem:	to s	solve	thinki	ng			have	little				
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Literature					Major sections
Survey Coverage of Content	The appropriate content is covered in depth without being redundant. Sources are cited when specific statements are made. Significance to purpose is unquestionable.	All major sections of the content are included, but not covered in as much depth, or as explicit, as expected. Significance to purpose is evident.	Most sections of the content are included, but not covered in as much depth, or as explicit, as expected. Significance to purpose is clear.	Few sections of pertinent content have been omitted The topic is of little significance to the purpose.	of pertinent content have been omitted or greatly run- on. The topic is of little significance to the purpose.
A synthesis of ideas and hypothesis	Insights into the problem are appropriate. Conclusions and the research questions are strongly supported in the survey	Insights into the problem are appropriate. Conclusions supported the problem statement.	Provides concluding remarks that show an analysis and synthesis of ideas occurred. Few of conclusions were not supportive	Provides concluding remarks that show an analysis and synthesis of ideas occurred. Some of the conclusions were not supported in the survey.	indication to synthesize the information or draw a conclusion.
Citations / References	All needed citations were included in the report. References matched the citations, and all were encoded in IEEE format.	All needed citations were included in the report. References matched the citations	Citations within the body of the report and a corresponding reference list were presented. Formatting had very few problems	Citations within the body of the report and a correspondi ng reference list were presented. Some formatting problems exist, or components were missing.	statements included in the report were not present, or references which were included were not found in the text.
High level design	All required modules designed with data flow diagram meeting all the objectives that have impact on real world concerns	All required modules designed with data flow diagram meeting most of the objectives	All required modules designed with data flow diagram meeting few of the objectives	Few modules designed with data flow diagram meeting few of the objectives	Project looks like traditional schoolwork with No authentic features designed and have no impact on real world concerns.
Document ation (Report Submissio n)	Clearly and effectively documented including descriptions of all the concepts +	Clearly and effectively documented including descriptions of all the concepts + Plagiarism Check Report	Clearly and effectively documented including descriptions of all the concepts +	Clearly and effectively documented including descriptions of all the concepts	No documentation included

Indivi	dual	Plagiari Report (Less th Distribu	an 10%)		%-15%) tribution of	Cł (1	agiarism neck Report 6%-20%) stribution of	+ Plagiar Check Report (21%-2 Distrib	25%)	Distribution of
Contri to projec	ibution the ct	workloa the tean is clean the go project achieved student contribu 100% the go project.	nd among m members rly defined, al of the is fully d and the nted his/her to achieve al of the	wor tean clea pro com stuc par wor him	rkload among the m members is arly defined, the ject is fully ppleted and the dent contributed tially to finish the rk allocated to a/her.	w ar n clo th pr ac st ac st	scribution of orkload nong the team embers is not early defined, e goal of the roject is artially there and udent does of contribute achieve the located work.	of wor among team membe clearly defined goal of project not ach and st does contrib	kload the ers is d, the of the c is nieved udent not oute chieve	workload among the team members is not clearly defined, the goal of the project is not achieved and student does not contribute to achieve the allocated work.
CIE AS	sessme	ent Patte	rn (50 Marks		b)				Repor	t Submission
F	RBT Lev	vels	Synopsis Presentatic Review-(on-	Review-1		Final Rev	iew		olagiarism
			5		15		20			10
L1		ember	-		-		-			
L2		erstand	-		-		-			10
L3 L4	Appl Anal		5		5 5		5			-
L4 L5	Eval		-		5		- 5			-
L5 L6	Crea		-		-		10			-
SEE As		ent Patte Levels		am M	b) Aarks ion (50)					
L1	Reme	mber	2100	10	. <i></i>					
L2	Under	rstand		10)					
L3	Apply			15						
L4	Analy			15						
	Evalu	ate	1	-						
L5 L6	Creat			-						

SEMESTER VII

(SYLLABUS)

					C	OMPU	TER V	/ISIOI	N					
Course Code	20C		1A						IE Mar			50		
L:T:P:S	3:0:	0:0							EE Mar			50		
Hrs / Week	3								'otal Ma			10	0	
Credits	03								xam Ho	ours		03		
			А	t the ei			e outco se, the s		will be	able to:				
20CEE81A.1	Expl	ain l	oasic	knowl	edge, tł	neories	and me	ethods	in imag	e proces	sing and	compute	er vision.	1
20CEE81A.2	Imp	leme	ent ba	asic and	l some	advano	ed ima	ge proo	cessing	techniqu	ies.			
20CEE81A.3							0	0	t, segme	entation	, and mo	tion estir	nations.	
20CEE81A.4				nage re										
20CEE81A.5		-		-					g and co	mputer	vision ap	oplicatior	15.	
20CEE81A.6	-		-	e-based		-	-							
Mapping of Course C				0				0	-	ic Outco				
	_	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PSO2
20CEE81A.1	2	-	-	-	-	-	-	-	-	-	-	-	2	-
20CEE81A.2	2	-	3	-	-	-	-	-	-	-	-	-	2	-
20CEE81A.3	3	-	-	-	-	-	-	-	-	-	-	-	2	-
20CEE81A.4	-	3	-	-	-	-	-	-	-	-	-	-	2	-
20CEE81A.5	-	-	3	-	3	-	-	3	3	3	-	3	2	-
20CEE81A.6	3	2	-	-	-	-	-	-	-	-	-	-	2	-
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MODULE-1			OUCT SSIN(G G	O IMA	GE FO	RMATI	ION AN	ID		20CEE8 20CEE8 20CEE8	1A.2	9	Hours
Computer Vision - Geo operators - Linear filt transformations - Glob Self-study	tering - al optir Inve	Mo Mizat Mizat	re no tion. ate th		rhood	operato	ors - F	ourier	transfo	rms - P	yramids			
	Tovt	Roc	1-1-1	Chanta					cessing	, techniq	ues.			
Text Book				Chapte	r 1 , Ch	apter 2	, Chapt	ter 3	cessing	; techniq		01 1 1		Lours
MODULE-2	FEA SEG	TUF MEN	RE DI NTAT	ETECT FION	r 1 , Ch ION, M	apter 2 IATCH	, Chapt ING AI	ter 3 ND			20CEE 20CEE 20CEE 20CEE 20CEE	81A.2 81A.3 81A.5		lours
MODULE-2 Points and patches - E Shift and Normalized c	FEA SEG Edges ar	TUF MEN	RE DI NTAT	ETECT ΓΙΟΝ urs – C	r 1 , Ch ION, M	apter 2 IATCH Tracki	, Chapt ING Al ng - Se	ter 3 ND gmenta	ition – A	Applicat	20CEE 20CEE 20CEE 20CEE 20CEE	81A.2 81A.3 81A.5		
MODULE-2 Points and patches - E Shift and Normalized c Self-study	FEA SEG Edges an cuts.	TUF MEN nd Co	E DI NTAT	ETECT FION urs – Co ne differ	r 1 , Ch ION, M ontour	apter 2 IATCH Tracki gmenta	, Chapt ING AI ng - Se tion tee	ter 3 ND gmenta	ition – A		20CEE 20CEE 20CEE 20CEE 20CEE	81A.2 81A.3 81A.5		
MODULE-2 Points and patches - E Shift and Normalized c Self-study Text Book MODULE-3	FEA SEG inve Text FEA EST	TUF MEN and Co stiga Boc TUF	AE DI NTAT	ETECT FION urs – Co ne differ Chapte ASED N	r 1, Ch ION, M ontour rent seg r 7. Te: ALI	apter 2 IATCH Tracki gmenta xt Bool GNME	, Chapi ING AI ng - Se tion tec 2: Cha NT	gmenta gmenta chnique pter 9 & 1	ition – A es and it MOTIO	Applicati ts applic	20CEE 20CEE 20CEE 20CEE ion, Clus ations. 20CEE 20CEE 20CEE 20CEE 20CEE	81A.2 81A.3 81A.5 tering pi 81A.1 81A.2 81A.3 81A.3	xels, Gra	phs, Mean
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MODULE-2 Points and patches - E Shift and Normalized of Self-study Text Book MODULE-3 Pairwise alignment - Estimation - Triangul Bundle adjustment - Layered motion. Self-study / Case	FEA SEG Cdges ar outs. Inve Text FEA EST Lation - Constru- Exp	TUE MEN MEN Stiga Boc TUE IMA TW aine lore	RE DI NTAT ontou ate the kk 1: 0 RE-B. RE-B. TIO! titchi o-fra d str the v	ETECT FION urs – Co ne differ Chapte ASED N ing – Co ing – Co ing str	r 1, Ch ION, M ontour rent sea r 7. Te ALI Global ucture and n	apter 2 IATCH Tracki gmenta xt Book GNME alignn from notion. rn mot	, Chap ING AI ng - Se tion tee 2: Cha NT nent – motion Trans ion est	gmenta ND gmenta chniquo pter 9 & 1 Comp a – Mul lationa imatio	es and it MOTIO vositing ti fram l alignr	Applicati ts applic N . Geome e struct nent - F	20CEE 20CEE 20CEE 20CEE ion, Clus ations. 20CEE 20CEE 20CEE 20CEE 20CEE etric int ure fror Parametr	81A.2 81A.3 81A.5 tering pir 81A.1 81A.2 81A.3 81A.5 rinsic can n motion ric motio	alibratio n - Facto on - Opti	phs, Mean Hours Hours n – Pose prization - ical flow -
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APPENDIX A

OUTCOME BASED EDUCATION

Outcome-based education (OBE) is an educational theory that bases each part of and educational system around goals (outcomes). By the end of the educational experience each student should have achieved the goal. There is no specified style of teaching or assessment in OBE; instead classes, opportunities, and assessments should all help students achieve the specified outcomes.

There are three educational Outcomes as defined by the National Board of Accreditation:

Program Educational Objectives: The Educational objectives of an engineering degree program are the statements that describe the expected achievements of graduate in their career and also in particular what the graduates are expected to perform and achieve during the first few years after graduation. [nbaindia.org]

Program Outcomes: What the student would demonstrate upon graduation. Graduate attributes are separately listed in Appendix C

Course Outcome: The specific outcome/s of each course/subject that is a part of the program curriculum. Each subject/course is expected to have a set of Course Outcomes

Mapping of Outcomes

COURSE OUTCOME PROGGRAM OUTCOME PROGRAM EDUCATIONAL OBJECTIVES DEPARTMENTAL MISSION DEPARTMENTAL VISION

APPENDIX B

The Graduate Attributes of NBA

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

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

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.

Conduct investigations of complex problems: The problems that cannot be solved by straight forward application of knowledge, theories and techniques applicable to the engineering discipline that may not have a unique solution. For example, a design problem can be solved in many ways and lead to multiple possible solutions that require consideration of appropriate constraints/requirements not explicitly given in the problem statement (like: cost, power requirement, durability, product life, etc.) which need to be defined (modeled) within appropriate mathematical framework that often require use of modern computational concepts and tools.

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.

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.

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.

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

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

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.

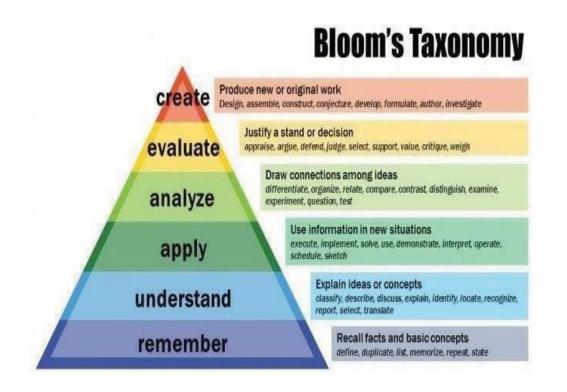
Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.

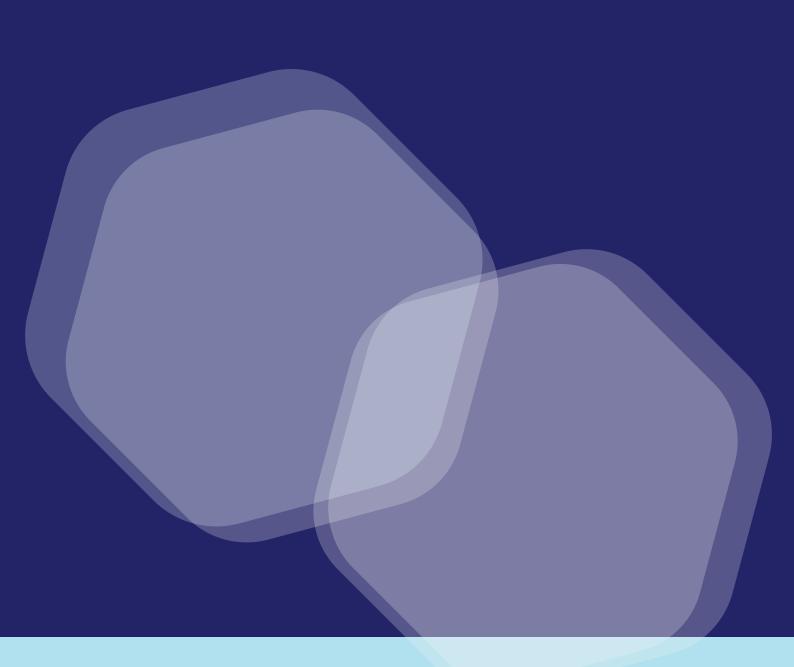
Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

APPENDIX C

BLOOM'S TAXONOMY

Bloom's taxonomy is a classification system used to define and distinguish different levels of human cognition—i.e., thinking, learning, and understanding. Educators have typically used Bloom's taxonomy to inform or guide the development of assessments (tests and other evaluations of student learning), curriculum (units, lessons, projects, and other learning activities), and instructional methods such as questioning strategies.





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