SCHOOL OF ENGINEERING AND TECHNOLOGY
Bachelor of Technology- Information Technology

Programme Code: SET0102
Duration- 4 Years Full Time

PROGRAM STRUCTURE
AND
CURRICULUM & SCHEME OF EXAMINATION
2021

1. Standard Structure of the Program at University Level

1.1 Vision, Mission and Core Values of the University

Vision of the University

To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.

Mission of the University

1. **Transformative educational experience**
2. **Enrichment by educational initiatives that encourage global outlook**
3. **Develop research, support disruptive innovations and accelerate entrepreneurship**
4. **Seeking beyond boundaries**

Core Values

- **Integrity**
- **Leadership**
- **Diversity**
- **Community**

Note: Detailed Mission Statements of University can be used for developing Mission Statements of Schools/ Departments.

Vision of the School

To become a globally acclaimed institution of higher learning in engineering and technology promoting excellence in research, innovation and entrepreneurship

Mission of the School

1. **To impart quality education with strong industry & academic connectivity in the expanding fields of Engineering and Technology in a conductive and enriching learning environment.**
2. **To product technocrats equipped with technical & soft skills and experiential learning required to stay current with the modern tools in emerging technologies to fulfill professional responsibilities and uphold ethical values.**
3. **To inculcate a culture of interdisciplinary research, innovation and entrepreneurship to provide sustainable solutions to meet the growing challenges and societal needs.**
4. **To foster collaborative learning and to play adaptive leadership role in professional career and pursuit of higher education through effective mentoring and counseling.**

Core Values

- **Competency**
- **Analytical learning**
- **Interdisciplinary research**
- **Global**

1.3 Programme Educational Objectives (PEO)

1.3.1 Writing Programme Educational Objectives (PEO)

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

The Program Educational Objectives (PEOs) of UG Program in Computer Science & Engineering are:

PEO-1 The graduates will establish themselves as professionals by solving real-life problems using exploratory and analytical skills acquired in the field of Computer Science and Engineering.

PEO-2 The graduates will provide sustainable solutions to ever changing interdisciplinary global problems through their Research & Innovation capabilities.

PEO-3 The graduates will become employable, successful entrepreneur as an outcome of Industry-Academia collaboration.

PEO-4 The graduates will embrace professional code of ethics while providing solution to multidisciplinary social problems in industrial, entrepreneurial and research environment to demonstrate leadership qualities

Methods of Forming PEO's

STEP 1 : The needs of the Nation and society are identified through scientific publications, industry interaction and media.

STEP 2. Taking the above into consideration, the PEOs are established by the Coordination Committee of the department.

STEP 3. The PEOs are communicated to the alumni and their suggestions are obtained.

STEP 4. The PEOs are communicated to all the faculty members of the department and their feedback is obtained.

STEP 5. The PEOs are then put to the Board of Studies of the department for final approval.

[Note: Prepare a file for the same, how you arrive for PEO's]

1.3.2 Map PEOs with Mission Statements:

DEPARTMENT PEOs / DEPT OF CSE MISSION STATEMENTS	1. The graduates will establish themselves as professionals by solving real-life problems using exploratory and analytical skills acquired in the field of Computer Science and Engineering.	2. The graduates will be able to provide sustainable solutions to ever changing interdisciplinary global problems through their Research & Innovation capabilities.	3. The graduates will become employable, successful entrepreneur and innovator as an outcome of Industry-Academia collaboration.	4. The graduates will be able to embrace professional code of ethics while providing solution to multidisciplinary social problems in industrial, entrepreneurial and research environment to demonstrate leadership qualities.	
1. To strengthen core competency of students to be successful, ethical, effective problem solver in Computer Science & Engineering through analytical learning.	3	3	2	2	10/12
2. To promote interdisciplinary research & innovation based activities in emerging areas of technology globally.	2	3	2	2	9/12
3. To facilitate and foster the industry-academia collaboration to enhance entrepreneurship skills and acquaintance with corporate culture.	2	2	3	3	10/12
4: To inculcate in them a higher degree of social consciousness and moral values towards solving interdisciplinary societal problems using industry-academia collaboration	2	2	2	3	9/12
	9/12	10/12	9/12	10/12	83%

Enter correlation levels 1, 2, or 3 as defined below:

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

If there is no correlation, put "-"

1.3.3 Program Outcomes (PO's)

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, review 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.
PSO1:		Experiment and prepare programming concepts and provide new ideas and innovations towards research and societal issues.
PSO2:		Analyse and develop computer programs in the areas related to algorithms, system software, cloud computing, artificial intelligence & machine learning, bioinformatics, big data analytics, block chain, cyber security and networking for efficient design of computer-based systems of varying complexity.
PSO3:		Apply standard Software Engineering practices and strategies in software project development using open-source programming environment to deliver a quality product for business success.

1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

Mapping	PEO1	PEO2	PEO3	PEO4
PO1	3	3	2	1
PO2	3	3	3	1
PO3	2	2	3	3
PO4	2	2	3	2
PO5	2	3	2	2
PO6	1	2	2	3
PO7	1	1	2	3
PO8	1	1	2	3
PO9	1	2	3	1
PO10	1	1	3	2
PO11	3	2	3	1
PO12	2	3	1	1
PSO1	2	3	1	3
PSO2	3	3	2	2
PSO3	3	3	2	2

1. Slight (Low) ***2. Moderate (Medium)*** ***3. Substantial (High)***

1.3.5 Program Outcome Vs Courses Mapping Table[1]:

Course Code	Course Name	Course Outcome Statement	PO1 Engineering knowledge	PO2 Problem analysis	PO3 Design/development of solutions	PO4 Conduct investigations of complex problems	PO5 Modern tool usage	PO6 The engineer and society	PO7 Environment and sustainability	PO8 Ethics	PO9 Individual and team work	PO10 Communication:	PO11 Project management and finance	PO12 Lifelong learning	PSO1 Familiarity and practical proficiency	PSO2 Understand, analyse and develop	PSO3 Apply standard Software
CSE113	Programming for Problem Solving	CO1	1	2	2						2				1	2	
		CO2	2		3	2	2				1		1		2	2	
		CO3	3		2	1					3					2	
		CO4	1		2	1					1					3	
		CO5	1		1											1	
		CO6	3	3	3	2					2		2		2	3	1
MTH142	Calculus and Abstract Algebra	CO1	3	3	2	2	3	1				1	1	1			
		CO2	3	3	3	2	2	2				1	1	2			
		CO3	3	3	2	2	2	1				1	1	1			
		CO4	3	3	2	2	2	1				1	1	1			
		CO5	3	3	2	2	2	1				1	1	2			
		CO6	3	3	2	3	2	2				1	1	2			
PHY125	Engineering Physics-I	CO1	3	3	2	2	2	1	1	1	2	1	1	1			
		CO2	3	3	2	3	3	2	1	1	1	1	1	1			
		CO3	3	3	2	3	3	2	1	1	1	1	1	1			
		CO4	3	3	3	2	3	2	1	1	1	1	1	1			

[1] Cel value will contain the correlation value of respective course with PO.

		CO5	3	3	3	2	3	2	1	1	1	1	1	1				
		CO6	3	3	3	3	3	2	1	1	1	1	1	1				
EVS103	Environmental Studies	CO1	2	2	3	3	3	3										
		CO2	2	2	2	2	2	3										
		CO3	2	2	3	2	3	3										
		CO4	2	2	3	2	3	3										
		CO5	2	2	2	2	3	3										
		CO6	2	2	3	2	2	3										
ARP101	Communicative English-1	CO1										3		3				
		CO2								2	2	2		3				
		CO3				2				2	2			3				
		CO4		2	2							2	2	3				
		CO5		3	2	2								2				
		CO6		2										3				
CSP113	Programming for Problem Solving Lab	CO1	2		3	2	2				2				3	2	2	
		CO2	3		3	2	2				3				3	3	1	
		CO3	2		3	1	2				2				2	3	2	
		CO4	1		2	1	1				2				2	2		
		CO5	2		3	2	2				3				3	2	2	
		CO6	3		3	3	1				2				2	3	2	
CSP101	Introduction to Computer Science and Engineering	CO1	3	2										3	3		3	
		CO2	3	2										3		3	2	
		CO3	3	2										3		2	3	
		CO4	3											3		3	2	
		CO5	3					2		2				3		3	3	
		CO6																
MEP106	Computer Aided	CO1	2	2	2		3							3	3	3		

	Design & Drafting	CO2	2	2	2		3							3	3	3	
		CO3	2	2	2		3							3	3	3	
		CO4	2	2	2	2	3				2	2		3	3	3	
		CO5	2	2	2	2	3				2	2		3	3	3	
		CO6	2	2	2	2	3				2	2		3	3	3	
PHY162	Physics Lab	CO1	2	2	2	1	1	1	2	3	3	3	2	3	2		
		CO2	2	2	2	1	1	1	2	3	3	3	2	3	2		
		CO3	2	2	2	1	1	1	2	3	3	3	2	3	2		
		CO4	2	2	2	1	1	1	2	3	3	3	2	3	2		
		CO5	2	2	2	1	1	1	2	3	3	3	2	3	2		
		CO6	2	2	2	1	1	1	2	3	3	3	2	3	2		
Semester II																	
CSE114	Application based Programming in Python	CO1	2	1	1					2				2		1	
		CO2	2	2	2	1				2				2		2	1
		CO3	2	2	1					2				2	1	2	1
		CO4	2	2	2	2	1	2		2				2	1	2	2
		CO5	2	2	2	2	3	2		2				2	2	2	1
		CO6	3	3	2	2	2	2		2				2	2	3	2
MTH145	Probability and	CO1	3	3	2	2	3	1				1	1	1			

	Statistics	CO2	3	2	3	2	2	2				1	1	2			
		CO3	3	3	2	2	2	1				1	1	1			
		CO4	3	2	2	2	2	1				1	1	1			
		CO5	3	3	2	2	2	1				1	1	2			
		CO6	3	3	2	3	2	2				1	1	2			
EEE112	Principles of Electrical and Electronics Engineering	CO1	3	3	2	2											
		CO2	1	1	2												
		CO3	2	2	1												
		CO4	2	1	2								1				
		CO5	3	2	1								1				
		CO6	2	2	3	1							1				
HMM111	Human Value & Ethics	CO1	1	1	1	1	2	1	2			2	3	1	1	3	
		CO2	1	3	2	2	1	3	1	1	2		3	3	2	2	1
		CO3		2	2	2		2	2		1		1		1	3	2
		CO4	1		1	2	3				2	3		2			1
		CO5		3		1	2	3	2	1		2	2	1	3	1	
		CO6	2		1			1			1	1				2	3
ARP102	Communicative English -2	CO1										3		3			
		CO2										3		3			
		CO3										3		3			
		CO4										3		3			
		CO5								3		3		3			
		CO6								3		3		3			
CSP105	Design and creativity Lab	CO1	3	3		3					3	3	2	3	2	2	1
		CO2	3	2		3			2		3	3	2	3			1
		CO3	3	2			2				3	3	2	3	2	2	
		CO4	3	3				2			3	3	2	3		2	

		CO5	3	3	2	2	2	2	3	3	3	3	2	3	2	2	
		CO6	3	3		3					3	3	2	3			1
CSP114	Application based Programming in Python	CO1	1	1	1	1				2				2		1	
		CO2	2	2	1	1	2			2				2		1	1
		CO3	2	2	1	1	1	1		2				2	1	2	1
		CO4	2	2	2	2	1	1		2				2	2	2	1
		CO5	2	2	2	2	2	2		2				2	2	2	2
		CO6	3	3	2	2	2	3		2				2	2	2	2
MEP105	Mechanical Workshop	CO1	1					2						2			
		CO2	1				1	2						1	1		1
		CO3	2		1		1	2						2	1		1
		CO4	2		1		2	2						2	1		1
		CO5	2		1		2	2						2	2		1
		CO6	2		1		2	2						2	2		1
EEP112	Principles of Electrical and Electronics Engineering	CO1	3	3	2	2											
		CO2	1	1	2												
		CO3	2	2	1												
		CO4	2	1	2								1				
		CO5	3	2	1								1				
		CO6	2	2	3	1							1				
Semester III																	

CSE242	Data Structures	CO1	2		2						2				2	2	
		CO2	1	2	3						1				3	1	2
		CO3	2	3	3	2					2				2	3	
		CO4			2						3			1	2	2	
		CO5	3	2	3	2	1				2				3	2	2
		CO6	2		3	3	2				1				2	3	3
CSE245	Discrete Structures	CO1	2	3	3	1		3			3			3	3	3	
		CO2	2	2	3			2						3	3	2	
		CO3	3	2	3	3	3				2					3	2
		CO4	2	2	3	3	3						3	3	3		3
		CO5	2	2	2	3		3			3		3	3		2	3
		CO6	1	2	1	2	3				3		3		3	3	2
CSE247	Computer Organization and Architecture	CO1	3	1	1			2						2		1	3
		CO2	3	3	3			3						3		2	3
		CO3	3	2	3			2						3		2	3
		CO4	3	2	2			1						3		3	2
		CO5	3	3	3			2						3		2	2
		CO6	3	3	3			2						3		1	2
CSE253	Object Oriented Programming Using Java	CO1					2							2			
		CO2					2										
		CO3	2	3	3		2				3			2	2	3	
		CO4					2										
		CO5					2										
		CO6	3	3	3		2	3	2		3		2	3	3	3	2

CSE254	Principles of Operating System	CO1	3	3	3	3				2	2	1	2	1	3	2	2
		CO2	3	2	3	3				2	2	2	1	1	2	3	2
		CO3	3	3	3	3				1	1	1	3	2	3	2	1
		CO4	2	2	2	2	1			2	3	3	3	1	2	2	2
		CO5	2	2	3					3	3	1	2		3		
		CO6	3	2								2	3		2	2	
CSE255	Introduction of Entrepreneurship	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															
ARP207	Logical Skills Building and Soft Skills	CO1		2	3												
		CO2						2		2	3						
		CO3								2	2						
		CO4									2			3			
		CO5										2					
		CO6		2													
CSP242	Data Structures Lab	CO1	2	2	3						3			2	3	2	2
		CO2	3	2	2	2	2				2				2	3	3
		CO3	3	1	3	3					3			1	3	2	2
		CO4	3	2	3	2					2			2	2	3	2
		CO5	2	2	2										1	2	2
		CO6	3	3	2	3					3				2	3	2
CSP243	Object Oriented Programming Using Java	CO1					2							2			
		CO2					2										
		CO3	2	3	3		2				3			2	2	3	

		CO4					2										
		CO5					2										
		CO6	3	3	3		2	3	2		3		2	3	3	3	2
CSP244	Principles of Operating System Lab	CO1	3	3	3	3				2	2	1	2	1	3	2	2
		CO2	3	2	3	3				2	2	2	1	1	2	3	2
		CO3	3	3	3	3				1	1	1	3	2	3	2	1
		CO4	2	2	2	2	1			2	3	3	3	1	2	2	2
		CO5	2	2	3					3	3	1	2		3		
		CO6	3	2								2	3		2	2	
CSP254	Project Based Learning (PBL) -1	CO1	3	3		3					3	3	2	3	2	2	1
		CO2	3	2		3			2		3	3	2	3			1
		CO3	3	2			2				3	3	2	3	2	2	
		CO4	3	3				2			3	3	2	3		2	
		CO5	3	3	2	2	2	2	3	3	3	3	2	3	2	2	
		CO6	3	3		3					3	3	2	3			1
CSP292	Summer Internship-I	CO1	2														
		CO2		3	2		2								2	2	
		CO3	2	2	3						3				1		
		CO4										3					
		CO5						2		3							
		CO6												2	1		
Semester IV																	

BTY223	Introduction to Biology for Engineers	CO1	3	1				1	3					3			
		CO2	3	2				2						3			
		CO3	3	3	3	1	1	3	3	2	1	3		3	1	1	
		CO4	3	2				2	2	3	1	2		3	1		
		CO5	3	1	1	1	3	1	3	2	1	2	1	3	1	1	
		CO6	3	3	1	1	2	3	5	1	1	1		3	1		
CSE249	Data Base Management System	CO1	3					2						3	3	3	
		CO2	2				3	2			2			3	3	3	
		CO3	3	3	3		3	2						2	2	3	
		CO4	3	3	3	3		2		2	3			2			3
		CO5	2	3	2		2	2		2				1		3	
		CO6	3	3	3	3	3	3		3	3	3	2	3			3
INT248	Human computer interaction	CO-1	1	-		-	1	1	1	2	1	2	3	-	3	1	-
		CO-2	1	1		-	1	1	1	2	2	2	3	-	3	1	-
		CO-3	1	1		-	1	1	1	2	2	2	3	-	3	2	-
		CO-4	1	2		-	1	1	1	2	2	2	3	-	3	1	-
		CO-5	3	3		3	3	2	1	2	2	2	3	3	3	1	-
		CO-6	2	3		3	3	2	2	3	2	2	3	3	3	3	2
CSE252	Computer Networks	CO1		2									2	3		3	
		CO2	2		2	2	3						2	3		3	
		CO3	3	2		2		2							2		2
		CO4		2	2											2	2
		CO5	2	2	2	2										2	
		CO6	2			2				2			2			2	

CSE011	Mathematical Techniques	CO1	3	2										2			
		CO2	2	3	1	1	1		1			1	2	1	1	1	
		CO3	3	1	1	1			1			2	1	1	3	1	
		CO4	2	3	2	1	1		1			1	1	1	2	1	
		CO5	1	1	1	2	2		1			1	2	1	2	1	
		CO6	3	1	3	1	2		2			2	2	3	3	1	
CSE012	Introduction to Graph Theory and its Applications	CO1	3	3	2	2	1	2	2			2	1	2	3	1	
		CO2	3	3	3	2		1	1			1		2	3	1	
		CO3	1	3	1	3	2	2				1		2	2	2	
		CO4	1	3	1	3	1	1				2		1	3	2	
		CO5	2	2	2	3	2	1				1		2	1	2	
		CO6	1	1	2	3	1	2				2		2	1	2	2
OE1	Open Elective – 1	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															
ARP208	Quantitative and Qualitative Aptitude Skill Building	CO1								2		3		3			
		CO2										2					
		CO3									2	2					
		CO4										2					
		CO5										2					
		CO6		2	2						2						
CSP249	Data Base Management System Lab	CO1	3				2								2	3	2
		CO2		3	3	3	2				3				2	3	3
		CO3		2	2	2	2				3				2	2	3

		CO4		2	2	2	2				3				2	2	3
		CO5		2	2	2	2				3				2	2	3
		CO6		2	3	2	3				3			2	3	3	3
CSP252	Computer Networks Lab	CO1		2									2	3		3	
		CO2	2		2	2	3						2	3		3	
		CO3	3	2		2		2							2		2
		CO4		2	2											2	2
		CO5	2	2	2	2										2	
		CO6	2			2				2			2			2	
CSP297	Project Based Learning (PBL) -2	CO1	3	3		3					3	3	2	3	2	2	1
		CO2	3	2		3			2		3	3	2	3			1
		CO3	3	2			2				3	3	2	3	2	2	
		CO4	3	3				2			3	3	2	3		2	
		CO5	3	3	2	2	2	2	3	3	3	3	2	3	2	2	
		CO6	3	3		3					3	3	2	3			1
Semester V																	
CSE354	Design and Analysis of Algorithm	CO1	2	3	1	2					2				3	2	2
		CO2	2	2	2	2					3				2	3	2
		CO3	2	1	2						1				3	2	

		CO4	1	2	2	3					2				2	2	2
		CO5	3	3	1	3					3				2	1	3
		CO6	2	2	3	2	2				2				3	2	
CSE355	Software Engineering and Testing Methodologies	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															
CSE356	Research Methodology	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															
CSE021	Introduction to Cloud Computing	CO1	2	3	1	2											
		CO2	2	2	2	3											
		CO3	1	3	1	2										2	3
		CO4	3	1	2	2										3	2
		CO5	2	2	3	1										2	2
		CO6	1	3	1	2									2	3	3
INT021	Ethical Hacking	CO-1	3	3	-	-	2	-	-	3	-	-	-	3	-	-	3
		CO-2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	3
		CO-3	3	3	2	-	2	-	-	-	2	-	-	2	3	-	-
		CO-4	3	3	-	3	2	3	-	2	-	-	-	-	-	3	-
		CO-5	3	2	3	-	-	-	-	3	3	-	-	-	-	3	-
		CO-6	3	3	-	3	3	3	3	-	-	3	3	-	3	-	-

CSE024	Web Technologies	CO1					1									1	
		CO2					3							1		1	
		CO3		1	3		2	1			2				1	2	2
		CO4		1	3		1	1			2				1	2	2
		CO5					2									1	
		CO6	2	3	3	1	3	3	1		3		2	2	1	2	3
OE-2	Open Elective – 2	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															
ARP305	Personality Development and Decision making Skills	CO1						2			2			3			
		CO2						2			2			3			
		CO3									2	2		3			
		CO4						2	2		2			3			
		CO5						2	2		2			3			
		CO6		2	2												
CSP350	Design and Analysis of Algorithm Lab	CO1	3	3	2	3	1				2				2	3	3
		CO2	2	3	3	2	2				2				3	2	2
		CO3	3	2	2		3				1				2	1	
		CO4	2	3	3	3	1				3				3	3	1
		CO5	3	2	2	3	2				2				2	3	2
		CO6	2	3	3	1	3				1				3	2	3
CSP354	Project Based Learning (PBL) -3	CO1	3	3		2		1		1	2		2	1	2	2	3
		CO2	3	2	2	2	2			1	2		2	1	2	1	1
		CO3	3	2	2	2	2	3		1	2		2	1	2	2	

		CO4	3	3	2	2	3			1	2			1	2	2	2
		CO5	3	2			3			1	2			1	2	2	
		CO6		1		1				2	2	3	3	3	1		1
CSP355	Software Engineering and Testing Methodologies	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															
INP248	Human computer interaction Lab	CO-1	2	1	1	1	3	1	-	-	1	3	3	3	2	2	1
		CO-2	2	1	2	2	3	1	-	-	1	3	3	3	2	2	1
		CO-3	2	1	2	2	3	1	-	-	1	3	3	3	2	2	1
		CO-4	2	1	2	2	3	1	-	-	1	3	3	3	2	2	1
		CO-5	2	2	2	2	3	1	-	-	2	3	3	3	2	2	1
		CO-6	3	2	3	3	3	2	-	-	3	3	3	3	2	2	1
CSP024	Web Technologies Lab	CO1					1				2					1	
		CO2		1	1		3				2			1		1	2
		CO3			1		2	1			2					1	2
		CO4					1	1									
		CO5		1			2				2			1		1	2
		CO6	2	3	3	1	3	3			3		2	2	1	2	3
CSP391	Summer Internship-II	CO1	2	2		3	2		1	1	1				1	2	2
		CO2	1	2	1	2	2		1	1	1				1	2	
		CO3	2		2	2	2			1	3		1	1	1	2	2
		CO4								1		3					
		CO5						2		3							
		CO6												2	2	2	

CSP395	Technical Skill Enhancement Course-1 Simulation Lab	CO1	1		1		2							1	1	2	1
		CO2	1		1		2					2		1	1	2	1
		CO3	1	2	1		2							1	1	2	1
		CO4	1		1		2							1	1	2	1
		CO5	1		1		2							1	1	2	1
		CO6	2	2	3	3	2	2	1		2	3	2	2	2	3	1
ECC301	Community Connect	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															
Semester VI																	
CSE022	Android Application Development	CO-1	-	-	-	-	3	-	-	-	2	-	-	1	-	-	2
		CO-2	-	-	-	-	3	-	-	-	2	-	-	1	-	-	2
		CO-3	-	-	2	-	3	-	-	-	2	-	-	1	2	-	2
		CO-4	-	-	-	-	3	-	-	-	2	-	2	1	-	-	2
		CO-5	-	-	2	3	3		2	-	2	-	2	1	-	-	2
		CO-6	1	2	3	3	3	3	3	-	3	-	3	1	3	3	3

HMM305	Management for Engineers	CO1	2	1	2	2	2	2		2	1	3			1	1	2
		CO2	1	1	2	2	1	2	1			2	2	1	1	1	2
		CO3	3	1	1	2	3	2		2			1	2	1	2	2
		CO4		2	2	1		1		1		2	1		1	1	2
		CO5		1	2	2		2	3	1	2			1	2	2	1
		CO6	1	2	1	1	2	2	2		1			1	2	2	2
CSE031	Digital Image Processing	CO1	3	3	3	3	1	1	1	1	1	2	1	3	2	3	1
		CO2	3	3	3	3	2	1	1	1	1	2	1	3	2	3	2
		CO3	3	3	3	3	2	1	1	1	1	2	1	3	3	3	2
		CO4	3	3	3	3	2	2	1	1	1	2	1	3	3	3	2
		CO5	3	3	3	3	2	2	1	1	1	2	1	3	3	3	2
		CO6	3	3	3	3	2	3	3	1	3	2	1	3	3	3	3
CSE032	Cryptography and Network Security	CO1	3	2											3	1	
		CO2	2	3	2	1									3	2	
		CO3	2		2		3								2	2	1
		CO4	2			2		2	2						2	2	
		CO5					2			2	2	2			1		
		CO6										2	2	2	2		2
CSE041	Software Project Management	CO1	3		1		1				3	2	3	2			2
		CO2	2		2		2				3	3	3	3			2
		CO3	2		3		2			1	3	2	3	3			3
		CO4	2		2		2			1	3	2	3	3			3
		CO5	1		3		2	3		1	3	3	3	3			3
		CO6	2		3	3	2	2		1	3	3	3	2			2
CSE042	Software Testing	CO1	2	1								3		2			3
		CO2	3	3	3	2	3	1		1	2	3		2	2		3
		CO3	3	3	3	2	2	2		1	2	3		2	2		3

		CO4	3	3	3	2	3	1		1	2	3		2	2		3
		CO5	3	3	2	2	2	2		1	2	3		2	2		3
		CO6	3	3	3	2	3	2	3	2	3	3	3	3	2		3
CSE051	Wireless Networks	CO1	3		3					1							2
		CO2	3	2	3					1							2
		CO3	3	2	3					1							2
		CO4	3	2	3					1							2
		CO5	3	2	3	2	2			1							3
		CO6	3	2	3	2	2			1							3
CSE052	Risk Management	CO1	3						1					1	2		
		CO2	2	2		3	2			1	2	1	1	1			2
		CO3	2								2			1	1		
		CO4	1		2		3				2	2	2				1
		CO5	2	2		2	1		1		2	1	1				1
		CO6	2	2	2				1		2	1	1	1		1	
CSE053	Advanced Operating System	CO1	3	3	3	3				2	2	1	2	1	3	2	2
		CO2	3	2	3	3				2	2	2	1	1	2	3	2
		CO3	3	3	3	3				1	1	1	3	2	3	2	1
		CO4	2	2	2	2	1			2	3	3	3	1	2	2	2
		CO5	2	2	3					3	3	1	2		3		
		CO6	3	2								2	3		2	2	
OE-3	Open Elective – 3	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															

ARP306	Campus to Corporate	CO1						2	2		2	3		3			
		CO2						2	2		2	3		3			
		CO3						2	2		2	3		3			
		CO4						2	2		2	3		3			
		CO5						2	2		2	3		3			
		CO6		2	2												
CSP022	Android Application Development Lab	CO-1					3				2			1			2
		CO-2					3				2			1			2
		CO-3			2		3				2			1	2		2
		CO-4					3				2		2	1			2
		CO-5			2	3	3		2		2		2	1			2
		CO-6	1	2	3	3	3	3	3		3		3	1	3	3	3
CSP396	Technical Skill Enhancement Course-2(Application Development Lab)	CO1	1		1		2							1	1	2	1
		CO2	1		1		2					2		1	1	2	1
		CO3	1	2	1		2							1	1	2	1
		CO4	1		2		2							1	1	2	1
		CO5	2		1		2							1	1	2	1
		CO6	2	2	3	2	2	2	1		2	3	2	2	2	3	1
CSP398	Project Based Learning (PBL) -4	CO1	3	3		2		1		1	2		2	1	2	2	3
		CO2	3	2	2	2	2			1	2		2	1	2	1	1
		CO3	3	2	2	2	2	3		1	2		2	1	2	2	
		CO4	3	3	2	2	3			1	2			1	2	2	2
		CO5	3	2			3			1	2			1	2	2	
		CO6		1		1				2	2	3	3	3	1		1
Semester VII																	

CSE472	Artificial Intelligence	CO1	1	2	3	2	2					2		2	3	2	2
		CO2	2	3	3	2	3					2		2	3	3	2
		CO3	3	3	3	3	2	1	1			1	2	3	3	2	3
		CO4	3	3	3	3	2	2	1			2	1	3	3	2	3
		CO5	2	3	3	3	3	2	2	2	3	2	2	2	3	3	2
		CO6	2	3	3	3	3	2	2	2	3	2	2	2	3	3	2
CSE062	Mobile Computing	CO1	3	3		2	3					2			3	2	
		CO2	3	3		2	3					2			3	2	
		CO3	3	3		2	3					2			2	3	
		CO4	3	3		2	3					2			3	2	
		CO5	3	3		2	3					2			2	2	
		CO6	3	3		2	3					2			2	2	
CSE063	Quantum Computing	CO1	3	3			2			3				3			3
		CO2	3	3	2												3
		CO3	3	3	2		2				2			2	3		
		CO4	3	3		3	2	3		2						3	
		CO5	3	2	3					3	3					3	
		CO6	3	3		3	3	3	3			3	3		3		
CSE071	Introduction to Internet of Things	CO1	3	1	1			2	1					3	3		
		CO2	2	2	1			1	3					3	3		
		CO3	3	1	1	2		2	1					3	3		

		CO4	3	3	3	3	2	2		3	3	3	3	3	2	2	3
		CO5	3	3	3	3	3	2	3					3	3		
		CO6	2	2	2	2	3	2	3					3	3		
CSE072	Parallel Computing Algorithms	CO1	3	3			2			3				3			3
		CO2	3	3	2												3
		CO3	3	3	2		2				2			2	3		
		CO4	3	3		3	2	3		2						3	
		CO5	3	2	3					3	3					3	
		CO6	3	3		3	3	3	3			3	3		3		
CSE073	3D Printing and Software Tools	CO1	3	3			2			3				3			3
		CO2	3	3	2												3
		CO3	3	3	2		2				2			2	3		
		CO4	3	3		3	2	3		2						3	
		CO5	3	2	3					3	3					3	
		CO6	3	3		3	3	3	3			3	3		3		
OE4	Open Elective - 4	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															
OE4	Open Elective - 5	CO1															
		CO2															
		CO3															
		CO4															
		CO5															
		CO6															

CSP472	Artificial Intelligence Lab	CO1	1	2	3	2	2					2		2	3	2	2
		CO2	2	3	3	2	3					2		2	3	3	2
		CO3	3	3	3	3	2	1	1			1	2	3	3	2	3
		CO4	3	3	3	3	2	2	1			2	1	3	3	2	3
		CO5	2	3	3	3	3	2	2	2	3	2	2	2	3	3	2
		CO6	2	3	3	3	3	2	2	2	3	2	2	2	3	3	2
CSP496	Summer Internship-III	CO1	2	2		3	2		1	1	1				1	2	2
		CO2	1	2	1	2	2		1	1	1				1	2	
		CO3	2		2	2	2			1	3		1	1	1	2	2
		CO4								1		3					
		CO5						2		3							
		CO6												2	2	2	
CSP497	Capstone - 1	CO1	3	3	3	2	2	2	2	1	2	1	1	2	2	3	3
		CO2	3	3	3	3	2	1	1	1	2	1	1	2	3	3	3
		CO3	3	1	3	3	2	1	1	1	2	1	1	2	3	3	3
		CO4	1	1	2	1	2	3	3	1	2	3	1	2	1	2	3
		CO5	1	2	2	1	2	1	1	1	2	2	1	2	1	2	3
		CO6	2	1	2	1	3			1	2	3	1	2	3	3	3

Semester VIII

CSP498	Capstone - 2	CO1	2	1	2	2	3	2	2	2	2	2	2	2	3	3	3
		CO2	2	2	3	2	3	2	2	2	2	2	2	2	11	3	3
		CO3	3	3	3	3	3	2	2	2	2	2	2	1	1	3	3
		CO4	2	2	2	2	3	2	2	2	2	3	2	1	1	2	2
		CO5	1	2	2	1	3	2	2	2	2	3	2	1	1	2	2
		CO6	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2

1. Slight (Low) ***2. Moderate (Medium)*** ***3. Substantial (High)***

1.3.5.2 COURSE ARTICULATION MATRIX[2]

Course Code	Course Name	PO -1	PO -2	PO -3	PO -4	PO -5	PO -6	PO -7	PO -8	PO -9	PO -10	PO -11	PO -12	PSO 1	PSO 2	PSO 3
		Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication:	Project management and finance	Life-long learning	Familiarity and practical proficiency	Understand, analyse and develop	Apply standard Software
CSE113	Programming for Problem Solving	1.83	2.50	2.17	1.50	2.00				1.80		1.50		1.67	2.17	1.00
MTH142	Calculus and Abstract Algebra	3.00	3.00	2.17	2.17	2.17	1.33				1.00	1.00	1.50			
PHY125	Engineering Physics-I	3.00	3.00	2.50	2.50	2.83	1.83	1.00	1.00	1.17	1.00	1.00	1.00			
EVS103	Environmental Studies	2.00	2.00	2.67	2.17	2.67	3.00									
ARP101	Communicative English-1		2.33	2.00	2.00				2.00	2.00	2.33	2.00	2.83			
CSP113	Programming for Problem Solving Lab	2.17		2.83	1.83	1.67				2.33				2.50	2.50	1.80
CSP101	Introduction to Computer Science and Engineering	3.00	2.00				2.00		2.00				3.00	3.00	2.75	2.60
MEP106	Computer Aided Design & Drafting	2.00	2.00	2.00	2.00	3.00				2.00	2.00		3.00	3.00	3.00	
PHY162	Physics Lab	2.00	2.00	2.00	1.00	1.00	1.00	2.00	3.00	3.00	3.00	2.00	3.00	2.00		
Semester II																

[2] Each course outcome (Based on Blooms Taxanomy-CO1, CO2, CO3, CO4, CO5, and CO6) of the course needs to map with PO. This table evolves once faculty has mapped each course outcomes of their respective course with PO's.

CSE114	Application based Programming in Python	2.17	2.00	1.67	1.75	2.00	2.00		2.00				2.00	1.50	2.00	1.40
MTH145	Probability and Statistics	3.00	2.67	2.17	2.17	2.17	1.33				1.00	1.00	1.50			
EEE112	Principles of Electrical and Electronics Engineering	2.17	1.83	1.83	1.50							1.00				
HMM111	Human Value & Ethics	1.25	2.25	1.40	1.60	2.00	2.00	1.75	1.00	1.50	2.00	2.25	1.75	1.75	2.20	1.75
ARP102	Communicative English -2								3.00		3.00		3.00			
CSP105	Design and creativity Lab	3.00	2.67	2.00	2.75	2.00	2.00	2.50	3.00	3.00	3.00	2.00	3.00	2.00	2.00	1.00
CSP114	Application based Programming in Python	2.00	2.00	1.50	1.50	1.60	1.75		2.00				2.00	1.75	1.67	1.40
MEP105	Mechanical Workshop	1.67		1.00		1.60	2.00						1.83	1.40		1.00
EEP112	Principles of Electrical and Electronics Engineering	2.17	1.83	1.83	1.50							1.00				
Semester III																
CSE242	Data Structures	2.00	2.33	2.67	2.33	1.50				1.83			1.00	2.33	2.17	2.33
CSE245	Discrete Structures	2.00	2.17	2.50	2.40	3.00	2.67			2.75		3.00	3.00	3.00	2.60	2.50
CSE247	Computer Organization and Architecture	3.00	2.33	2.50			2.00						2.83		1.83	2.50
CSE253	Object Oriented Programming Using Java	2.50	3.00	3.00		2.00	3.00	2.00		3.00		2.00	2.33	2.50	3.00	2.00
CSE254	Principles of Operating System	2.67	2.33	2.80	2.75	1.00			2.00	2.20	1.67	2.33	1.25	2.50	2.20	1.75
CSE255	Introduction of Entrepreneurship															
ARP207	Logical Skills Building and Soft Skills		2.00	3.00			2.00		2.00	2.33	2.00		3.00			
CSP242	Data Structures Lab	2.67	2.00	2.50	2.50	2.00				2.60			1.67	2.17	2.50	2.17
CSP243	Object Oriented Programming Using Java	2.50	3.00	3.00		2.00	3.00	2.00		3.00		2.00	2.33	2.50	3.00	2.00
CSP244	Principles of Operating System Lab	2.67	2.33	2.80	2.75	1.00			2.00	2.20	1.67	2.33	1.25	2.50	2.20	1.75
CSP254	Project Based Learning (PBL) -1	3.00	2.67	2.00	2.75	2.00	2.00	2.50	3.00	3.00	3.00	2.00	3.00	2.00	2.00	1.00
CSP292	Summer Internship-I	2.0	2.5	2.5		2.0	2.0		3.0	3.0	3.0		2.0	1.33	2.00	

		0	0	0		0	0		0	0	0		0				
Semester IV																	
BTY223	Introduction to Biology for Engineers	3.00	2.00	1.67	1.00	2.00	2.00	3.20	2.00	1.00	2.00	1.00	3.00	1.00	1.00		
CSE249	Data Base Management System	2.67	3.00	2.75	3.00	2.75	2.17		2.33	2.67	3.00	2.00	2.33	2.67	3.00	3.00	
INT248	Human computer interaction	1.50	2.00		3.00	1.67	1.33	1.17	2.17	1.83	2.00	3.00	3.00	3.00	1.50	2.00	
CSE252	Computer Networks	2.25	2.00	2.00	2.00	3.00	2.00		2.00			2.00	3.00	2.00	2.40	2.00	
CSE011	Mathematical Techniques	2.33	1.83	1.60	1.20	1.50		1.20			1.40	1.60	1.40	2.17	1.00		
CSE012	Introduction to Graph Theory and its Applications	1.83	2.50	1.83	2.67	1.40	1.50	1.50			1.50	1.00	1.83	2.17	1.67	2.00	
OE1	Open Elective – 1																
ARP208	Quantitative and Qualitative Aptitude Skill Building		2.00	2.00					2.00	2.00	2.20		3.00				
CSP249	Data Base Management System Lab	3.00	2.20	2.40	2.20	2.17				3.00			2.00	2.17	2.50	2.83	
INP248	Human computer interaction Lab	2.17	1.33	2.00	2.00	3.00	1.17			1.50	3.00	3.00	3.00	2.00	2.00	1.00	
CSP252	Computer Networks Lab	2.25	2.00	2.00	2.00	3.00	2.00		2.00			2.00	3.00	2.00	2.40	2.00	
CSP297	Project Based Learning (PBL) -2	3.00	2.67	2.00	2.75	2.00	2.00	2.50	3.00	3.00	3.00	2.00	3.00	2.00	2.00	1.00	
Semester V																	
CSE354	Design and Analysis of Algorithm	2.00	2.17	1.83	2.40	2.00				2.17				2.50	2.00	2.25	
CSE355	Software Engineering and Testing Methodologies																
CSE356	Research Methodology																
CSE021	Introduction to Cloud Computing	1.83	2.33	1.67	2.00									2.00	2.50	2.50	
INT021	Ethical Hacking	3.00	2.83	2.33	3.00	2.25	3.00	3.00	2.67	2.50	3.00	3.00	2.50	3.00	3.00	3.00	
CSE024	Web Technologies	2.00	1.67	3.00	1.00	2.00	1.67	1.00		2.33		2.00	1.50	1.00	1.50	2.33	
OE-2	Open Elective – 2																
ARP305	Personality Development and Decision making Skills		2.0	2.0			2.0	2.0		2.0	2.0		3.0				

			0	0			0	0		0	0		0				
CSP350	Design and Analysis of Algorithm Lab	2.50	2.67	2.50	2.40	2.00				1.83				2.50	2.33	2.20
CSP354	Project Based Learning (PBL) -3	3.00	2.17	2.00	1.80	2.50	2.00		1.17	2.00	3.00	2.25	1.33	1.83	1.80	1.75
CSP355	Software Engineering and Testing Methodologies															
CSP024	Web Technologies Lab	2.00	1.67	1.67	1.00	2.00	1.67			2.20		2.00	1.33	1.00	1.20	2.25
CSP391	Summer Internship-II	1.67	2.00	1.50	2.33	2.00	2.00	1.00	1.40	1.67	3.00	1.00	1.50	1.25	2.00	2.00
CSP395	Technical Skill Enhancement Course-1 Simulation Lab	1.17	2.00	1.33	3.00	2.00	2.00	1.00		2.00	2.50	2.00	1.17	1.17	2.17	1.00
ECC301	Community Connect															
	Semester VI															
CSE022	Android Application Development	1.00	2.00	2.33	3.00	3.00	3.00	2.50		2.17		2.33	1.00	2.50	3.00	2.17
HMM305	Management for Engineers	1.75	1.33	1.67	1.67	2.00	1.83	2.00	1.50	1.33	2.33	1.33	1.25	1.33	1.50	1.83
CSE031	Digital Image Processing	3.00	3.00	3.00	3.00	1.83	1.67	1.33	1.00	1.33	2.00	1.00	3.00	2.67	3.00	2.00
CSE032	Cryptography and Network Security	2.25	2.50	2.00	1.50	2.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.17	1.75	1.50
CSE041	Software Project Management	2.00		2.33	3.00	1.83	2.50		1.00	3.00	2.50	3.00	2.67			2.50
CSE042	Software Testing	2.83	2.67	2.80	2.00	2.60	1.60	3.00	1.20	2.20	3.00	3.00	2.17	2.00		3.00
CSE051	Wireless Networks	3.00	2.00	3.00	2.00	2.00			1.00							2.33
CSE052	Risk Management	2.00	2.00	2.00	2.50	2.00		1.00	1.00	2.00	1.25	1.25	1.00	1.50	1.00	1.33
CSE053	Advanced Operating System	2.67	2.33	2.80	2.75	1.00			2.00	2.20	1.67	2.33	1.25	2.50	2.20	1.75
OE-3	Open Elective – 3															
ARP306	Campus to Corporate		2.00	2.00			2.00	2.00		2.00	3.00		3.00			
CSP022	Android Application Development Lab	1.00	2.00	2.33	3.00	3.00	3.00	2.50		2.17		2.33	1.00	2.50	3.00	2.17
CSP396	Technical Skill Enhancement Course-2(Application Development Lab)	1.33	2.00	1.50	2.00	2.00	2.00	1.00		2.00	2.50	2.00	1.17	1.17	2.17	1.00

CSP398	Project Based Learning (PBL) -4	3.00	2.17	2.00	1.80	2.50	2.00		1.17	2.00	3.00	2.25	1.33	1.83	1.80	1.75
Semester VII																
CSE472	Artificial Intelligence	2.17	2.83	3.00	2.67	2.50	1.75	1.50	2.00	3.00	1.83	1.75	2.33	3.00	2.50	2.33
CSE062	Mobile Computing	3.00	3.00		2.00	3.00					2.00			2.50	2.17	
CSE063	Quantum Computing	3.00	2.83	2.33	3.00	2.25	3.00	3.00	2.67	2.50	3.00	3.00	2.50	3.00	3.00	3.00
CSE071	Introduction to Internet of Things	2.67	2.00	1.83	2.50	2.67	1.83	2.20	3.00	3.00	3.00	3.00	3.00	2.83	2.00	3.00
CSE072	Parallel Computing Algorithms	3.00	2.83	2.33	3.00	2.25	3.00	3.00	2.67	2.50	3.00	3.00	2.50	3.00	3.00	3.00
CSE073	3D Printing and Software Tools	3.00	2.83	2.33	3.00	2.25	3.00	3.00	2.67	2.50	3.00	3.00	2.50	3.00	3.00	3.00
OE4	Open Elective - 4															
OE4	Open Elective - 5															
CSP472	Artificial Intelligence Lab	2.17	2.83	3.00	2.67	2.50	1.75	1.50	2.00	3.00	1.83	1.75	2.33	3.00	2.50	2.33
CSP496	Summer Internship-III	1.67	2.00	1.50	2.33	2.00	2.00	1.00	1.40	1.67	3.00	1.00	1.50	1.25	2.00	2.00
CSP497	Capstone - 1	2.17	1.83	2.50	1.83	2.17	1.60	1.60	1.00	2.00	1.83	1.00	2.00	2.17	2.67	3.00
Semester VIII																
CSP498	Capstone - 2	1.83	2.00	2.33	2.00	2.83	2.00	2.00	2.00	2.00	2.33	2.00	1.50	3.17	2.50	2.50

1-Slight (Low)
2-Moderate (Medium)
3-Substantial (High)

Course Outcome

- **Course Outcomes**–What is it?
  - Course outcomes (COs) are clear statements of what a student should be able to demonstrate on completion of a course.
  - COs should be assessable and measurable knowledge, skills, abilities and attitudes that student attains by the end of the course.
  - It is generally good idea to identify between 4 and 7 outcomes.
  - All courses in a particular programme shall have their own PO.
  - Each CO is mapped to relevant PO.
  - The teaching learning process and assessment process are to be designed in a way to achieve the COs.

Beginning words for Course Outcome:

Active verbs developed based on Bloom's Taxonomy

Knowledge	Understand	Apply	Analyze	Evaluate	Create
define	explain	solve	analyze	reframe	design
identify	describe	apply	compare	criticize	compose
describe	interpret	illustrate	classify	evaluate	create
label	paraphrase	modify	contrast	order	plan
list	summarize	use	distinguish	appraise	combine
name	classify	calculate	infer	judge	formulate
state	compare	change	separate	support	invent
match	differentiate	choose	explain	compare	hypothesize
recognize	discuss	demonstrate	select	decide	substitute
select	distinguish	discover	categorize	discriminate	write
examine	extend	experiment	connect	recommend	compile
locate	predict	relate	differentiate	summarize	construct
memorize	associate	show	discriminate	assess	develop
quote	contrast	sketch	divide	choose	generalize
recall	convert	complete	order	convince	integrate
reproduce	demonstrate	construct	point out	defend	modify
tabulate	estimate	dramatize	prioritize	estimate	organize
tell	express	interpret	subdivide	find errors	prepare
copy	Identify	Manipulate	survey	grade	produce
discover	indicate	Paint	advertise	measure	rearrange
duplicate	Infer	Prepare	appraise	predict	rewrite
enumerate	relate	produce	Break down	rank	role-play

(Reference: Retrieved from http://www.teachthought.com/learning/249-blooms-taxonomy-verbs-for-critical-thinking/)

School of Engineering and Technology							
Department Of Computer Science & Engineering							
B.Tech-Information Technology							
Batch: 2021 Onwards						**TERM: I**	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	CSE113	Programming for Problem Solving	3	0	0	3	
2	MTH142	Calculus and Abstract Algebra	3	1	0	4	
3	PHY125	Engineering Physics-I	3	1	0	4	
4		Environmental Studies	2	0	0	2	
	OR						
	HMM111	Human Value & Ethics					
Practical/Viva-Voce/Jury							
5	ARP101	Communicative English-1	1	0	2	2	
6	CSP113	Programming for Problem Solving Lab	0	0	2	1	
7	CSP101	Introduction to Computer Science and Engineering	0	0	2	1	
8	MEP106	Computer Aided Design & Drafting	0	0	3	1.5	
	OR						
	MEP105	Mechanical Workshop	0	0	3		
9	PHY162	Physics Lab	0	0	2	1	
TOTAL CREDITS						**19.5**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
B.Tech-Information Technology							
Batch: 2021 Onwards						TERM: II	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	CSE114	Application based Programming in Python	3	0	0	3	
2	MTH145	Probability and Statistics	3	1	0	4	
3	EEE112	Principles of Electrical and Electronics Engineering	2	1	0	3	
4	HMM111	Human Value & Ethics	2	0	0	2	
	OR						
		Environmental Studies					
Practical/Viva-Voce/Jury							
5	ARP102	Communicative English -2	1	0	2	2	
6	CSP105	Design and creativity Lab	1	0	2	2	
7	CSP114	Application based Programming in Python	0	0	2	1	
8	MEP105	Mechanical Workshop	0	0	3	1.5	
	OR						
	MEP106	Computer Aided Design & Drafting	0	0	3		
9	EEP112	Principles of Electrical and Electronics Engineering	0	0	2	1	
TOTAL CREDITS						**19.5**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
B.Tech-Information Technology							
Batch: 2021 Onwards						TERM: III	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	CSE242	Data Structures	3	0	0	3	
2	CSE245	Discrete Structures	3	1	0	4	
3	CSE247	Computer Organization and Architecture	3	0	0	3	
4	CSE253	Object Oriented Programming Using Java	2	0	0	2	
5	CSE254	Principles of Operating System	2	0	0	2	
6	CSE255	Introduction of Entrepreneurship	2	0	0	2	
Practical/Viva-Voce/Jury							
7	ARP207	Logical Skills Building and Soft Skills	1	0	2	2	
8	CSP242	Data Structures Lab	0	0	2	1	
9	CSP243	Object Oriented Programming Using Java	0	0	2	1	
10	CSP244	Principles of Operating System Lab	0	0	2	1	
11	CSP254	Project Based Learning (PBL) -1	0	0	4	2	
12	CSP292	Summer Internship-I	-	-	-	2	
TOTAL CREDITS						**25**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
B.Tech-Information Technology							
Batch: 2021 Onwards						TERM: IV	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	BTY223	Introduction to Biology for Engineers	2	0	0	2	
2	CSE249	Data Base Management System	3	0	0	3	
3	INT248	Human computer interaction	3	0	0	3	Discrete Structures
4	CSE252	Computer Networks	3	0	0	3	
5	PE-1	Program Elective-1	3	0	0	3	
	CSE011	Mathematical Techniques					
	CSE012	Introduction to Graph Theory and its Applications					
6	OE1	Open Elective – 1	2	0	0	2	
Practical/Viva-Voce/Jury							
7	ARP208	Quantitative and Qualitative Aptitude Skill Building	1	0	2	2	
8	CSP249	Data Base Management System Lab	0	0	2	1	
9	CSP252	Computer Networks Lab	0	0	2	1	PBL-I
10	INP248	Human computer interaction Lab	0	0	2	1	
11	CSP297	Project Based Learning (PBL) -2	0	0	4	2	
TOTAL CREDITS						**23**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
B.Tech-Information Technology							
Batch: 2021 Onwards						TERM: V	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	CSE354	Design and Analysis of Algorithm	3	0	0	3	Data Structure
2	CSE355	Software Engineering and Testing Methodologies	2	0	0	2	
3	CSE356	Research Methodology	2	0	0	2	
4	PE2	Program Elective-2				3	Operating System(3)
	CSE021	Introduction to Cloud Computing	3	0	0		Object Oriented Programming using Java(Semester 3)
	INT021	Ethical Hacking					
	CSE024/ CSP024	Web Technologies	2	0	2		
5	OE-2	Open Elective – 2	2	0	0	2	
Practical/Viva-Voce/Jury							
6	ARP305	Personality Development and Decision making Skills	1	0	2	2	
7	CSP350	Design and Analysis of Algorithm Lab	0	0	2	1	
8	CSP354	Project Based Learning (PBL) -3	0	0	4	2	
9	CSP355	Software Engineering and Testing Methodologies	0	0	2	1	Data Structure Lab
10	CSP391	Summer Internship-II	-	-	-	2	Operating system, Database Management s
11	CSP395	Technical Skill Enhancement Course-1 Simulation Lab	0	0	2	1	PBL-2
12	ECC301	Community Connect	-	-	-	2	Summer Internship-I
TOTAL CREDITS						**23**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
B.Tech-Information Technology							
Batch: 2021 Onwards						TERM: VI	
S. No.	**Course Code**	**Course**	**Teaching Load**			**Credits**	**Pre-Requisite/Co Requisite**
			L	**T**	**P**		
THEORY SUBJECTS							
1	CSE022	Android Application Development	3	0	0	3	
2	HMM305	Management for Engineers	3	0	0	3	
3	PE3	Program Elective-3	3	0	0	3	
	CSE031	Digital Image Processing					
	CSE032	Cryptography and Network Security					
4	PE4	Program Elective-4	3	0	0	3	
	CSE041	Software Project Management					
	CSE042	Software Testing					
5	PE5	Program Elective-5	3	0	0	3	
	CSE051	Wireless Networks					
	CSE052	Risk Management					
	CSE053	Advanced Operating System					
6	OE-3	Open Elective – 3	3	0	0	3	
Practical/Viva-Voce/Jury							
7	ARP306	Campus to Corporate	1	0	2	2	
8	CSP022	Android Application Development Lab	0	0	2	1	Principles of Operating system Lab
9	CSP396	Technical Skill Enhancement Course-2(Application Development Lab)	0	0	2	1	
10	CSP398	Project Based Learning (PBL) -4	0	0	4	2	PBL-3
TOTAL CREDITS						**24**	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
B.Tech-Information Technology							
Batch: 2021 Onwards						TERM: VII	
S. No.	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
			L	T	P		
THEORY SUBJECTS							
1	CSE472	Artificial Intelligence	3	0	0	3	
2		Program Elective-6	3	0	0	3	
	CSE062	Mobile Computing					
	CSE063	Quantum Computing					
3		Program Elective-7	2	0	0	2	
	CSE071	Introduction to Internet of Things					
	CSE072	Parallel Computing Algorithms					
	CSE073	3D Printing and Software Tools					
4		Comprehensive Examination	0	0	0	0	Audit
5	OE4	Open Elective - 4	2	0	0	2	
6	OE4	Open Elective - 5	3	0	0	3	
Practical/Viva-Voce/Jury							
7	CSP472	Artificial Intelligence Lab	0	0	2	1	
8	CSP496	Summer Internship-III	-	-	-	2	PBL-4
9	CSP497	Capstone - 1	-	-	-	2	Summer Internship-II
TOTAL CREDITS						18	

School of Engineering and Technology							
Department Of Computer Science & Engineering							
B.Tech-Information Technology							
Batch: 2021 Onwards						TERM: VIII	
S. No.	Course Code	Course	Teaching Load			Credits	Pre-Requisite/Co Requisite
			L	T	P		
Practical/Viva-Voce/Jury							
1	CSP498	Capstone - 2	-	-	-	8	Major Project - 1
TOTAL CREDITS						8	
		Term	L	T	P	Credits	TTH
		TERM-I.	12	2	14	19.5	28
		TERM-II.	12	2	14	19.5	28
		TERM-III.	16	1	12	25	29
		TERM-IV.	17	0	12	23	29
		TERM-V.	15	0	14	23	29
		TERM-VI.	19	0	10	24	29
		TERM-VII.	13	0	2	18	15
		TERM-VIII.	-	-	-	8	0
		TOTAL CREDITS				160	

C. Course Syllabuses

TERM-I

Schools: SET | SOL | SMFE | SBS-BBA | SBSR | SOE | SAP		Batch : 2021-2022 Academic Year: 2021-2022 Semester: 1st
1	Course Code	ARP101
2	Course Title	Communicative English-1
3	Credits	2
4	Contact Hours (L-T-P)	1-0-2
5	Course Objective	To minimize the linguistic barriers that emerges in varied socio-linguistic environments through the use of English. Help students to understand different accents and standardise their existing English. Guide the students to hone the basic communication skills - listening, speaking, reading and writing while also uplifting their perception of themselves, giving them self-confidence and building positive attitude.
6	Course Outcomes	After completion of this course, students will be able to: CO1 Develop a better understanding of advanced grammar rules and write grammatically correct sentences CO2 Acquire wide vocabulary and punctuation rules and learn strategies for error-free communication. CO3 Interpret texts, pictures and improve both reading and writing skills which would help them in their academic as well as professional career CO4 Comprehend language and improve speaking skills in academic and social contexts CO5 Develop, share and maximise new ideas with the concept of brainstorming and the documentation of key critical thoughts articulated towards preparing for a career based on their potentials and availability of opportunities. CO6 Function effectively in multi-disciplinary teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality
7	Course Description	The course is designed to equip students, who are at a very basic level of language comprehension, to communicate and work with ease in varied workplace environment. The course begins with basic grammar structure and pronunciation patterns, leading up to apprehension of oneself through written and verbal expression as a first step towards greater employability.
8	Outline syllabus – ARP 101	

	Unit A	Sentence Structure	CO Mapping
	Topic 1	Subject Verb Agreement	CO1

	Topic 2	Parts of speech	
	Topic 3	Writing well-formed sentences	
	Unit B	**Vocabulary Building & Punctuation**	
	Topic 1	Homonyms/ homophones, Synonyms/Antonyms	CO1, CO2
	Topic 2	Punctuation/ Spellings (Prefixes-suffixes/Unjumbled Words)	CO1, CO2
	Topic 3	Conjunctions/Compound Sentences	CO1, CO2
	Unit C	**Writing Skills**	
	Topic 1	Picture Description – Student Group Activity	CO3
	Topic 2	Positive Thinking - Dead Poets Society-Full-length feature film - Paragraph Writing inculcating the positive attitude of a learner through the movie | SWOT Analysis – Know yourself	CO3, CO2, CO3
	Topic 3	Story Completion Exercise –Building positive attitude - The Man from Earth (Watching a Full length Feature Film)	CO2, CO3
	Topic 4	Digital Literacy | Effective Use of Social Media	CO3
	Unit D	**Speaking Skill**	
	Topic 1	Self-introduction/Greeting/Meeting people – Self branding	CO4
	Topic 2	Describing people and situations - To Sir With Love (Watching a Full length Feature Film)	CO4
	Topic 3	Dialogues/conversations (Situation based Role Plays)	CO4
	Unit E	**Professional Skills | Career Skills**	
	Topic 1	Exploring Career Opportunities	CO4, CO5
	Topic 2	Brainstorming Techniques & Models	CO4, CO5
	Topic 3	Social and Cultural Etiquettes	CO4, CO5
	Topic 4	Internal Communication	CO4, CO5
	Unit F	**Leadership and Management Skills**	
	Topic 1	Managerial Skills	CO6
	Topic 2	Entrepreneurial Skills	CO6
9	Evaluations	*Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations (60% CA and 40% ETE*	*N/A*
10	Texts & References | Library Links	• Blum, M. Rosen. *How to Build Better Vocabulary*. London: Bloomsbury Publication • Comfort, Jeremy (et.al). *Speaking Effectively*.	

		Cambridge University Press	

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
ARP101.1	-	-	-	-	-	-	-	-	1	3		2	-	-	-
ARP101.2	-	-	-	-	-	-	-	-	1	3		2	-	-	-
ARP101.3	-	-	-	-	-	-	-	-	1	3		2	-	-	-
ARP101.4	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP101.5	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP101.6	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-

School: SET		**Batch :**	
Program: B.Tech		**Current Academic Year:**	
Branch: ALL		**Semester:1**	
1	Course Code	**CSE113** Course Name: Programming for problem solving	
2	Course Title	Programming for problem solving	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	1. Learn basic programming constructs –data types, decision structures, control structures in C 2. learning logic aptitude programming in c language 3. Developing software in c programming	
6	Course Outcomes	Students will be able to: CO1: **demonstrate** the algorithm, Pseudo-code and flow chart for the given problem. CO2**: develop** better understanding of basic concepts of C programming. CO3: **create** and implement logic using array and function. CO4: **construct** and implement the logic based on the concept of strings and pointers. CO5: **apply** user-defined data types and I/O operations in file. CO6: **design** and develop solutions to real world problems using C.	
7	Course Description	Programming for problem solving gives the Understanding of C programming and implement code from flowchart or algorithm	
8	Outline syllabus		CO Mapping
	Unit 1	**Logic Building**	
	A	Flowchart: Elements, Identifying and understanding input/ output, Branching and iteration in flowchart	CO1,
	B	Algorithm design: Problem solving approach(top down/bottom up approach)	CO1
	C	Pseudo Code : Representation of different construct, writing pseudo-code from algorithm and flowchart	CO1
	Unit 2	**Introduction to C Programming**	
	A	Introduction to C programming language, Data types, Variables, Constants, Identifiers and keywords, Storage classes	CO2, CO6
	B	Operators and expressions, Types of Statements: Assignment, Control, jumping.	CO2, CO6
	C	Control statements: Decisions, Loops, break,	CO2,

		continue	CO6
	Unit 3	**Arrays and Functions**	
	A	Arrays: One dimensional and multi dimensional arrays: Declaration, Initialization and array manipulation (sorting, searching).	CO3, CO6
	B	Functions: Definition, Declaration/Prototyping and Calling, Types of functions, Parameter passing: Call by value, Call by reference.	CO3, CO6
	C	Passing and Returning Arrays from Functions, Recursive Functions.	CO3, CO6
	Unit 4	**Pre-processors and Pointers**	
	A	Pre-processors: Types, Directives, Pre-processors Operators (#,##,\) , Macros: Types, Use, predefined Macros	CO4, CO6
	B	Pointer: Introduction, declaration of pointer variables, Operations on pointers: Pointer arithmetic, Arrays and pointers, Dynamic memory allocation.	CO4, CO6
	C	String: Introduction, predefined string functions, Manipulation of text data, Command Line Arguments.	CO4, CO6
	Unit 5	**User Defined Data Types and File Handling**	
	A	Structure and Unions: Introduction, Declaration, Difference, Application, Nested structure, self-referential structure, Array of structures, Passing structure in function.	CO5, CO6
	B	Files: Introduction, concept of record, I/O Streaming and Buffering, Types of Files: Indexed file, sequential file and random file,	CO5, CO6
	C	Creating a data file, Opening and closing a data file, Various I/O operations on data files: Storing data or records in file, adding records, Retrieving, and updating Sequential file/random file.	CO5, CO6
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. *The C Programming Language*	
	Other References	1. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 2. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**CO1:** demonstrate the algorithm, Pseudo-code and flow chart for the given problem.	**PO1,PO2,PO3, PO9, PSO1,PSO2**
2.	**CO2:** develop better understanding of basic concepts of C programming. .	**PO1,PO3, PO4, PO5, PO9, PO11,PSO1,PSO2**
3.	**CO3:** : create and implement logic using array and function.	**PO1,PO3,PO4, PO9, PSO2**
4.	**CO4:** construct and implement the logic based on the concept of strings and pointers.	**PO1,PO3,PO4, PO9, PSO2**
5.	**CO5:** apply user-defined data types and I/O operations in file.	**PO1,PO3,PSO2**
6	**CO6:** design and develop solutions to real world problems using C.	**PO1,PO2,PO3,PO4,PO9, PO11,PSO1 PSO2,PSO3**

PO and PSO mapping with level of strength for Course Name Programming for problem solving (Course Code CSE 113)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	1	2	2	_	_	-	_	_	2	_	_	_	1	2	_
CO2	2	_	3	2	2	-	_	_	1	_	1	_	2	2	_
CO3	3	_	2	1	_	_	_	_	3	_	_	_	_	2	_
CO4	1	_	2	1	_	_	_	_	1	_	_	_	_	3	_
CO5	1	_	1	_	_	_	_	_	_	_	_	_	_	1	_
CO6	3	3	3	2	-	-	_	_	2	_	2	_	2	3	1

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE113	Programming for problem solving	1.83	2.50	2.17	1.50	2.00				1.80		1.50		1.67	2.17	1.00

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

Syllabus: CSP 101:Introduction to Computer Science and Engineering

School: SET		**Batch : 2018**	
Program:B.Tech		**Current Academic Year:**	
Branch: CSE		**Semester:I**	
1	Course Code	CSP101 | Course Name	
2	Course Title	Introduction to Computer Science and Engineering	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	UG	
5	Course Objective	1. To familiarize the students about the importance of Undergraduate course on Computer Science & Engineering. 2. To discuss recent developments in hardware and software environments. 3. To focus future application areas of Computer Science and Engineering. 4. To discuss various research and development options in Computer Science and Engineering.	
6	Course Outcomes	**The student should be able to:** CO1: Understand the technical aspects of Computer Science & Engineering Course. CO2: Perceive some knowledge about programming in various applications. CO3: Acquire basic understanding about computer networking and related technology. CO4: Enhance some fundamental knowledge of DBMS including application areas. CO5: Understand the current trends in computing in discovering wisdom/knowledge and future prediction.	
7	Course Description	This course focuses application areas of Computer Science and Engineering for students admitted in undergraduate program. The purpose of B. Tech. in Computer Science & Engineering is to be given through this course to students.	
8	Outline syllabus		CO Mapping
	Unit 1	**Hardware aspect of Computer Science & Engineering**	
	A	History of Computing Systems, Computer Basics and Computer Organization.	CO1
	B	Computer Architecture, Introduction to various connecting devices.	
	C	Recent additions – IoT, Robotics and new alternate architectures.	
	Unit 2	**Programming Aspects**	
	A	Basics of Programming, Programming Paradigms, System Software versus Application Software.	CO2
	B	Hard Computing versus Soft Computing, Data Structures and Algorithms.	

	C	Computer Graphics, Multimedia, Computer Vision.			
	Unit 3	**Computer Networking**			
	A	Introduction to Networking, Various terminologies, Client Server Technology, Web Technology.			CO3
	B	Introduction to data/network security and current trends.			
	C	Concept of Cloud Computing and Virtualization, Real life applications.			
	Unit 4	**Database Management Systems**			
	A	Introduction to DBMS, DBMS versus File System, Relational DBMS.			CO4
	B	Information Processing and Retrieval			
	C	Big Data Analytics & Scientific Computing			
	Unit 5	**Artificial Intelligence**			
	A	Basics of Artificial Intelligence			CO5
	B	Basics of Pattern Recognition			
	C	Basics of Machine Learning			
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		60%	NIL	40%	
	Text book/s*	1. Introduction to Computer, Peter Norton, 7/e, 2017, Tata McGraw Hill Publishing.			
	Other References	2. Foundations of Computer Science, B A Forouzan& F Mosharraf, 2/e, 2008, Delmar Learning.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Understand the technical aspects of Computer Science &Engineering Course.	PO1, PO2, PO12, PSO3
2.	**CO2:**Perceive some knowledge about programming in various applications.	PO1, PO12, PSO1, PSO3
3.	**CO3:** Acquire basic understanding about computer networking and related technology.	PO1, PO2, PO12, PSO2, PSO3
4.	**CO4:**Enhance some fundamental knowledge of DBMS including application areas.	PO1, PO12, PSO2, PSO3
5.	**CO5:** Understand the current trends in computing in discovering wisdom/knowledge and future prediction.	PO1, PO6, PO8, PO12, PSO2, PSO3

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	3	2	-	-	-	-	-	-	-	-	-	3	3	-	3
CO 2	3	2	-	-	-	-	-	-	-	-	-	3	-	3	2
CO 3	3	2	-	-	-	-	-	-	-	-	-	3	-	2	3
CO 4	3	-	-	-	-	-	-	-	-	-	-	3	-	3	2
CO 5	3	-	-	-	-	2	-	2	-	-	-	3	-	3	3

Syllabus: CSP 113: Programming for problem solving Lab

School: SET		**Batch: 2018**	
Program: B.Tech.		**Current Academic Year: 2018-19**	
Branch: CSE		**Semester: I**	
1	Course Code	CSP113	
2	Course Title	Programming for problem solving Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	1. Learn basic programming constructs –data types, decision structures, control structures in C 2. learning logic aptitude programming in c language 3. Developing software in c programming	
6	Course Outcomes	Students will be able to: CO1: **Implement** core concept of c Programming CO2: **develop** programs using Array and String CO3: **create** Functions for any problem CO4: **Use** Union and Structure to write any program CO5: **implement** concept of Pointers CO6**: design** a real world problem with the help of c programming	
7	Course Description	Programming for problem solving gives the Understanding of C programming and implement code from flowchart or algorithm	
8	Outline syllabus		CO Mapping
	Unit 1	**Logic Building**	**CO1, CO6**
		Draw flowchart for finding leap year	
		Write a c Program to Add Two Integers	
		Write a program to create a calculator	
	Unit 2	**Introduction to C Programming**	**CO2, CO6**
		Write a c program to convert length meter to cm	
		Write a c program to convert temp	
		Write a c program to swap two numbers	
	Unit 3	**Arrays and Functions**	**CO3, CO6**
		Write a c program to calculate the average using arrays	
		Write a c program to find the largest element of the array	
	Unit 4	**Pre-processors and Pointers**	**CO4, CO6**
		Write a c program to swap two values using pointers	
		Write a c program to find largest number from array using pointers	
	Unit 5	**User Defined Data Types and File Handling**	**CO5, CO6**
		Write a c program to store information of a student using structure	
		Write a c program to store information of a student using union	

	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	Kernighan, Brian, and Dennis Ritchie. *The C Programming Language*			
	Other References	4. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 5. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999			

Course outline

This course implements array and pointer and Recursive applications. The course talks primarily about Array, string, functions, structure & union and Pointers etc.

Course Evaluation	
Attendance	None
Any other	CA judged on the practicals conducted in the lab , weightage may be specified
References	
Text book	Kernighan, Brian, and Dennis Ritchie. *The C Programming Language*
Other References	1. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004. 2. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999
Softwares	Turbo C

PO and PSO mapping with level of strength for Course Name Programming for problem solving Lab **(Course Code CSP113)**

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSP113_ Programming for problem solving Lab	CO1	2	-	3	2	2	-	-	-	2	-	-	-	3	2	2
	CO2	3	-	3	2	2	-	-	-	3	-	-	-	3	3	1
	CO3	2	-	3	1	2	-	-	-	2	-	-	-	2	3	2
	CO4	1	-	2	1	1	-	-	-	2	-	-	-	2	2	-
	CO5	2	-	3	2	2	-	-	-	3	-	-	-	3	2	2
	CO6	3	-	3	3	1	-	-	-	2	-	-	-	2	3	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSP113	Programming for problem solving Lab	2.17		2.83	1.83	1.67	-	-	-	2.33	-	-	-	2.50	2.50	1.80

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

1. Course : Environmental Science

School: SET		**Batch : 2017-2018**	
Program: B. Tech		**Current Academic Year: 2018-2019**	
Branch: All		**Semester: I**	
1	Course Code	EVS-103	
2	Course Title	Environmental Science	
3	Credits	02	
4	Contact Hours (L-T-P)	2-0-0	
	Course Status	Compulsory	
5	Course Objective	1. Enable students to learn the concepts, principles and importance of environmental science 2. Provide students an insight of various causes of natural resource depletion and its conservation 3. Provide knowledge of layers of atmosphere with an insight of role of climatic elements in dispersion of pollutants 4. Provide detailed knowledge of causes, effects and control of different types of environmental pollution, solid waste management and its effect on climate change, global warming and ozone layer depletion 5. Provide and enrich the students about social issues such as R&R, water conservation and sustainability.	
6	Course Outcomes	CO1.Understand the scope of environmental science with knowledge about various types of natural resources and its conservation CO2. Study about the structure and composition of atmosphere and factors affecting weather and climate CO3. Study about pollution causes, effects and control and solid waste management CO4. Effect of global warming and ozone layer depletion CO5.Understand sustainable development, resettlement and rehabilitation, impact of population explosion on environment CO6.Understand overall environmental issues and its management	
7	Course Description	Environmental Science emphasises on various factors as 1. Importance and scope of environmental science 2. Natural resource conservation 3. Pollution causes, effects and control methods and solid waste management 4. Social issues associated with environment	
8	Outline syllabus		CO Mapping
	Unit 1	**General Introduction**	
	A	Definition, principles and scope of environmental science	CO1
	B	Water Resources, Land Resources, Food Resources	CO1
	C	Mineral Resources, Energy Resources, Forest Resources	CO1
	Unit 2	**Atmosphere and meteorological parameters**	

	A	Structure and composition of atmosphere	CO2
	B	Meteorological parameters: Pressure, Temperature, Precipitation, Humidity,	CO2
	C	Radiation, Wind speed and direction, Wind Rose	CO2
	Unit 3	**Environmental Pollution (Cause, effects and control measures)**	
	A	Air, water, Noise and Soil pollution	CO3
	B	Case studies on pollution	CO3
	C	Solid waste management: Causes, effects and control measures of urban and industrial wastes.	CO3
	Unit 4	**Climate Change and its impact**	
	A	Concept of Global Warming and greenhouse effect	CO4
	B	Ozone layer Depletion and its consequences	CO4
	C	Climate change and its effect on ecosystem, Kyoto protocol and IPCC concerns on changing climate	CO4
	Unit 5	**Social Issues and the Environment**	
	A	Concept of sustainable development, Water conservation	CO5
	B	Resettlement and rehabilitation of people; its problems and concerns, Case studies	CO5
	C	Population explosion and its consequences	CO5
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	**1.** Joseph, Benny, "Environmental Studies", Tata Mcgraw Hill. **2.** .Howard S. Peavy, Donald R. Rowe, George Tchobanoglous. Environmental engineering Mc Graw-Hill, 1985	
	Other References		

Mapping

Outcome no. → Syllabus topic↓	1	2	3	4	5
UNIT 1					
a	X				
b	X				
c	X				
UNIT 2					
a		X			
b		X			
c		X			
UNIT 3					
a			X		
b			X		
c			X		
UNIT4					
a				X	
b				X	
c				X	

UNIT 5					
a					X
b					X
c					X

PO 1: **Knowledge-** Students will be able to gain in-depth and detailed functional knowledge of the fundamental concepts and experimental methods of biochemistry and allied sciences

PO 2: **Proficiency-** Students will demonstrate competence in the analysis and critique of scholarly work in their area of expertise in biochemistry

PO 3: **Research-** Students will demonstrate their academic skills necessary to take up higher education on core or interdisciplinary research issues**.**

PO 4: **Skills-** Students will be able to design, conduct, analyze, and interpret data for a biochemistry and interdisciplinary research study

PO 5: **Communication-** Students will be capable to demonstrate their skills necessary for scientific communication/ oral and poster presentation/ Journal club / mini projects / Dissertation.

PO 6: **Responsibility-** Students shall have a clear understanding of professional and ethical responsibility

CO↓ PO→	PO1	PO2	PO3	PO4	PO5	PO6
C106.1	2	2	3	3	3	3
C106.2	2	2	2	2	2	3
C106.3	2	2	3	2	3	3
C106.4	2	2	3	2	3	3
C106.5	2	2	2	2	3	3
C106.6	2	2	3	2	2	3

School:	**School of Engineering and technology**
Department	**Department of Computer Science and Engineering**
Program:	**B.Tech**
Branch:	**Computer Science**

1	Course No.	HMM111
2	Course Title	**Human** Value and Ethics
3	Credits	2
4	Contact Hours (L-T-P)	(2-0-0)2
5	Course Objective	To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence
6	Course Outcomes	**On a successful completion of this course students will be able to** 1. Understand that the technical education without study of human values can generate more problems than solutions. 2. Define the principles and ideals, which help in making the judgement of what is more important. 3. See that 'I' and 'Body' are two realities, and most of their desires are related to 'I' and not body, while their efforts are mostly centered on the fulfilment of the needs of the body assuming that it will meet the needs of 'I' too. 4. Appreciate the importance of harmony in the self, family and the society for mutual fulfilment. 5. Understand the importance of harmony among human beings, other living beings and entire nature for universal equilibrium and mutual co-existence. 6. Know and practice the ethical approach in profession for continuous happiness and sustained prosperity.
7	Outline of syllabus:	
7.01	**Unit A**	**The Need and Process for Value Education**
7.02	Unit A Topic 1	The need, basic guidelines, content and process for Value Education
7.03	Unit A Topic 2	Concept of 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration; Continuous Happiness and Prosperity- A look at basic Human Aspirations
7.04	Unit A Topic 3	Right understanding, Relationship and Physical Facilities- the basic requirements for fulfilment of aspirations of every human being with their correct priority
7.05	**Unit B**	**Understanding Harmony in the Human Being - Harmony in Myself**
7.06	Unit B Topic 1	Human being as a co-existence of the sentient 'I' and the material 'Body'
7.07	Unit B Topic 2	The needs of Self ('I') and 'Body' ; Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
7.08	Unit B Topic 3	The characteristics and activities of 'I' and harmony in 'I' ; Understanding the harmony of I with the Body: Correct appraisal of Physical needs, meaning of Prosperity in detail
7.09	**Unit C**	**Harmony in the Family and Society**
7.10	Unit C Topic 1	Values in human-human relationship; Trust and Respect as the foundational values of relationship
7.11	Unit C Topic 2	Understanding the meaning of Trust; Difference between intention and competence; The meaning of Respect; Difference between respect and differentiation; the other salient values in relationship
7.12	Unit C Topic 3	Harmony in the society (society being an extension of family; Visualizing a universal harmonious order in society - from family to world family
7.13	**Unit D**	**Harmony in the Nature and Existence**
7.14	Unit D Topic 1	The harmony in the Nature
7.15	Unit D Topic 2	Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature

7.16	Unit D Topic 3	Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
7.17	**Unit E**	**Competence in professional ethics**
7.18	Unit E Topic 1	Ability to utilize the professional competence for augmenting universal human order
7.19	Unit E Topic 2	Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,
7.20	Unit E Topic 3	Ability to identify and develop appropriate technologies and management patterns for above production systems.
8	Course Evaluation	
8.1	Course work: 30 marks	
8.11	Attendance	None
8.12	Homework	4 assignments, no weight
8.13	Quizzes/Class Tests	Two
8.14	Projects	None
8.15	Presentations	None
8.16	Any other	None
8.2	MTE	one, 20 marks
8.3	End-term examination: 50 marks	
9.1	Text books	1. R.R Gaur, R Sangal, G P Bagaria, "A foundation course in Human Values and professional Ethics", Excel books, New Delhi
9.2	Other references	1. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. 2. A.N. Tripathy, 2003, Human Values, New Age International Publishers. 3. PL Dhar, RR Gaur, Science and Humanism, Commonwealth Purblishers.

Mapping of Outcomes vs. Topics

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO 3
HMM 111	CO1	1	1	1	1	2	1	2			2	3	1	1	3	
	CO2	1	3	2	2	1	3	1	1	2		3	3	2	2	1
	CO3		2	2	2		2	2		1		1		1	3	2
	CO4	1		1	2	3				2	3		2			1
	CO5		3		1	2	3	2	1		2	2	1	3	1	
	CO6	2		1			1			1	1				2	3

School: SET		**Batch : 2018-2022**	
Program: B.Tech		**Current Academic Year: 2018**	
Branch: Mechanical Engineering		**Semester: II**	
1	Course Code	MEP 105	
2	Course Title	**Mechanical Workshop**	
3	Credits	1.5	
4	Contact Hours (L-T-P)	0-0-3	
	Course Status	Compulsory	
5	Course Objective	The objective of this course is to make the students, familiar with the modern day manufacturing processes, introduce them to various hand tools and equipment, acclimatize with the measuring devices, and perform basic machine tool operations in various machine tools.	
6	Course Outcomes	After successful completion of this course, students will be able to CO1: Apply 5S (Seiri, Seiton, Seiso, Seiketsu and Shitsuke) methodology at workplace. CO2: Select the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc. CO3: Choose different measuring devices according to the job CO4: Differentiate between various machine tools and their operation CO5: Classify and select suitable tools for machining processes including turning, facing, thread cutting and tapping, milling, drilling and shaping. CO6: Apply the knowledge for advance manufacturing experiments.	
7	Course Description	**Black Smithy Shop:** Simple exercises based on black smithy operations such as upsetting, practice of S -Hook from circular bar using hand forging operations. **Carpentry Shop :** Study of different types of wood , Carpentry Tools, Equipment and different joints, Practice of T joint, cross lap joint, Mortise and Tenon T joint, Bridle T joint **Fitting Shop:** Preparation of Square joint, V joint, half round joint, dovetail jointas per the given specifications, which contains: Sawing, Filing, Grinding, and Practice marking operations. **Sheet Metal Shop:** Study of galvanized Iron (G.I.) Sheet material properties, hand tools and sheet metal machines, and projective geometry, demonstration of different sheet metal operations and practice of development of Tray, cylinder, hopper, funnel etc. **Welding Shop:** Introduction, Study of Tools and welding Equipment (Gas and Arc welding), Selection of welding electrode and current, Bead practice and Practice of Butt Joint, Lap Joint. **Machine Shop:** Study of machine tools in particular Lathe machine (different parts, different operations, study of cutting tools), Demonstration of different operations on Lathe machine, Practice of Facing, Plane Turning, step turning, taper turning, knurling and parting and Study of Quick return mechanism of Shaper. **Foundry Shop:** Introduction to foundry, Patterns, pattern allowances, ingredients of moulding sand and melting furnaces. Foundry tools and their purposes, Demo of mould preparation and Practice – Preparation of mould by using split pattern.	
8	Outline syllabus		CO Mapping
	List of Experiments		
	Experiment 1	To make a S shaped hook from a given circular rod using hand forging technique.	CO4
	Experiment 2	To make a dovetail lap joint in Carpentry shop.	CO2,CO3
	Experiment 3	To make a cross-half lap joint in Carpentry shop.	CO2,CO3
	Experiment 4	To make a square fit from the given mild steel pieces	CO3,CO5

		in fitting shop.			
	Experiment 5	To prepare a V-Fit from the given mild steel pieces in fitting shop.			CO3, CO5
	Experiment 6	To make a rectangular tray of specified dimensions in sheet metal shop.			CO2, CO5
	Experiment 7	To make a Lap joint, using the given mild steel pieces using arc welding.			CO3, CO5
	Experiment 8	To perform step turning and taper turning operations on the given work piece			CO5
	Experiment 9	To prepare a sand mold, using the given single piece pattern			CO2
	Experiment 10	To prepare a sand mold, using the given Split-piece pattern.			CO2
	Mode of examination	Practical			
	Weight- age Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1. Raghuwanshi B.S., Workshop Technology Vol. I & II, DhanpathRai& Sons. 2. Kannaiah P. and Narayana K.L., Workshop Manual, 2nd Edn, Scitech publishers. 3. John K.C., Mechanical Workshop Practice. 2nd Edn. PHI 2010. 4. JeyapoovanT.andPranitha S., Engineering Practices Lab Manual, 3rd Edn. Vikas Pub.2008.			

Program Outcome Vs Courses Mapping Table:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO105.1	1	-	-	-	-	2	-	-	-	-	-	2	-	-	-
CO105.2	1	-	-	-	1	2	-	-	-	-	-	1	1	-	1
CO105.3	2	-	1	-	1	2	-	-	-	-	-	2	1	-	1
CO105.4	2	-	1	-	2	2	-	-	-	-	-	2	1	-	1
CO105.5	2	-	1	-	2	2	-	-	-	-	-	2	2	-	1
CO105.6	2	-	1	-	2	2	-	-	-	-	-	2	2	-	1
CO105	**2**	**-**	**1**	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**-**	**1**

1-Slight (Low) **2-Moderate (Medium)** **3-Substantial (High)**

School: SET		**Batch : 2018-2022**	
Program: B.Tech		**Current Academic Year: 2018**	
Branch: ALL		**Semester: I**	
1	Course Code	MEP 106	
2	Course Title	Computer Aided Design & Drafting Laboratory	
3	Credits	1.5	
4	Contact Hours (L-T-P)	0-0-3	
	Course Status	Compulsory	
5	Course Objective	The objective of this introductory course is to make students familiar with computer-aided drafting/ design, introduce them about the basic commands, tools and dimension techniques for creation and presentation of various engineering drawing by using AutoCAD software which helps in visualization and problem solving in engineering disciplines.	
6	Course Outcomes	After successful completion of this course the student will be able to CO1: Understand the fundamental features of AutoCAD workspace and user interface. CO2: Apply the fundamental tools such as draw, edit, and view for creating two dimensional engineering drawings in AutoCAD. CO3: Choose advance features to present an engineering drawing in AutoCAD. CO4: Apply text and dimension features in the engineering drawing. CO5: Create different orthographic projections from a pictorial view. CO6: Analyze an engineering drawing and use the software packages for drafting and modeling.	
7	Course Description	This introductory course is offered to students to make them proficient in design, layout, product development, and other careers that require technical drawing. Using the current version of the AutoCAD software, students will learn a variety of drawing techniques and be able to replicate specific drawings in multiple perspectives. The pinnacle of the class is to empower and enable students to create using the software provided. Career opportunities in 3D modeling, manufacturing, and engineering will also be explored. No drafting or computer experience is necessary.	
8	Outline syllabus		CO Mapping
	List of Experiments		
	Experiment 1	Introduction to AutoCAD and its interface	CO1
	Experiment 2	Working with coordinates, Drawing offline, circle, arc, polygon and creating sketches	CO2
	Experiment 3	Editing of drawing by using editing Tools and Power tools	CO2
	Experiment 4	Creating of advanced feature like fillet, chamfer, hatch and using of block	CO3
	Experiment 5	Representing text and dimensioning in AutoCAD	CO4
	Experiment 6	Creating the drawings of mechanical components by using AutoCAD features.	CO2, CO3
	Experiment 7	Creating the electrical circuit drawings in AutoCAD.	CO2
	Experiment 8	Drawing plan and elevation of various buildings in AutoCAD.	CO2, CO4
	Experiment 9	Creating the drawing of renowned constructions such as Taj Mahal in AutoCAD	CO3

	Experiment 10	Creating of orthographic projections from a pictorial views			CO5
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1. Ibrahim Zaid,"CAD/CAM- Theory and Practice", McGraw Hill, International Edition.			
	Software	AutoCAD			

1.3.5.1 COURSE ARTICULATION MATRIX

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO106 .1	2	2	2	-	3	-	-	-	-	-	-	3	3	3
CO106 .2	2	2	2	-	3	-	-	-	-	-	-	3	3	3
CO106 .3	2	2	2	-	3	-	-	-	-	-	-	3	3	3
CO106 .4	2	2	2	2	3	-	-	-	2	2	-	3	3	3
CO106 .5	2	2	2	2	3	-	-	-	2	2	-	3	3	3
CO106 .6	2	2	2	2	3	-	-	-	2	2	-	3	3	3

1-Slight (Low)
2-Moderate (Medium)
3-Substantial (High)

School: SET		**Batch : 2018- 2021**	
Program: B.Tech.		**Current Academic Year: 2018-19**	
Branch: CSE		**Semester: 1**	
1	Course Code	**MTH 142**	
2	Course Title	**Calculus and Abstract Algebra**	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Compulsory	
5	Course Objective	The objective of this course is to familiarize the prospective engineers with techniques in basic calculus and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.	
6	Course Outcomes	CO1: Explain the concept of differential calculus, illustrate thecurvature and Maxima, minima and saddle point. (K2, K3, K4) CO2: Explain the basic concepts matrices and determinate, evaluate system of linear equation by using rank and inverse method. (K2, K3, K5) CO3: Explain the basic concept of sets, relation, functions, groups Rings and Field. (K2, K4) CO4: Discuss the basic of Vector spaces. (K1, K3) CO5: Describe and use the linear transformation and evaluate nullity and kernel. (K1, K2, K3, K5) CO6:Explain the concept of Eigen values and Eigen vectors; evaluate the diagonalization of matrices,explain the basic introduction of Inner product spaces.(K2, K3, K4, K5)	
7	Course Description	This course is an introduction to the fundamental of Mathematics. The primary objective of the course is to develop the basic understanding of differential and integral calculus, linear Algebra and Abstract Algebra.	
8	**Outline syllabus:Calculus and Abstract Algebra**		**CO Mapping**
	Unit 1	**Calculus**	
	A	Differentiation, Taylor's and Maclaurin theorems with remainders; indeterminate forms, L' Hospital's rule.	CO1
	B	Maxima and minima, Partial derivatives, Euler's theorem.	CO1
	C	Total derivative. Evaluation of double integration. Applications of double integral (to calculate area).	CO1

	Unit 2	**Matrices**	
	A	Matrices, vectors: addition and scalar multiplication, matrix multiplication.	CO2
	B	Linear systems of equations, linear Independence, rank of a matrix, determinants, Cramer's Rule	CO2
	C	Inverse of a matrix, Gauss elimination and Gauss-Jordan elimination.	CO2
	Unit 3	**Basic Algebra**	
	A	Sets, relations and functions.	CO3
	B	Basics of groups, cyclic groups.	CO3
	C	Subgroups, basics of Rings and Field.	CO3
	Unit 4	**Vector spaces**	
	A	Vector Space, linear dependence of vectors, basis, dimension.	CO4, CO5
	B	Linear transformations (maps), range and kernel of a linear map, rank and nullity.	CO4, CO5
	C	Inverse of a linear transformation, Matrix associated with a linear map.	CO4, CO5
	Unit 5	**Vector spaces (Prerequisite Module 2 –Matrices & Module-4 Vector spaces)**	
	A	Eigenvalues, Eigenvectors	CO6
	B	Symmetric, skew-symmetric, and orthogonal Matrices, Diagonalization	CO6
	C	Basic introduction of Inner product spaces, Gram-Schmidt orthogonalization.	CO6
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE 30% / 20% / 50%	
	Text book/s*	1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002. 2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.	
	Other References	1. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005. 2. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008. 3. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010. 4. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East–West press, Reprint 2005.	

COURSE OUTCOMES – PROGRAMME OUTCOMES MAPPING TABLE

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C142.1	3	3	2	2	3	1	-	-	-	1	1	1
C142.2	3	3	3	2	2	2	-	-	-	1	1	2
C142.3	3	3	2	2	2	1	-	-	-	1	1	1
C142.4	3	3	2	2	2	1	-	-	-	1	1	1
C142.5	3	3	2	2	2	1	-	-	-	1	1	2
C142.6	3	3	2	3	2	2	-	-	-	1	1	2

PHY125 Engineering Physics-I

School: School of Basic Sciences and Research		**Batch:2021-2025**	
Program: B.TECH .		**Current Academic Year: 2021-2022**	
Branch: CSE/EC/EEE		**Semester:**	
1	Course Code	PHY125	
2	Course Title	Engineering Physics-I	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Compulsory	
5	Course Objective	To make students proverbial with the fundamental concepts of Semiconductors materials and electromagnetism and their real-life applications for configuring various electronics devices.	
6	Course Outcomes	After the completion of this course, CO1: Students will learn the fundamental concepts of mobility, conductivity, electrons and holes in an intrinsic semiconductors, Donor and Acceptor impurities (n-type and p-type semiconductor), Fermi levels etc. Students will gain knowledge about the formation of depletion region, barrier potential, Zener diode, Characteristics of Zener diode etc. CO2: Students will have a clear understanding of Coherent sources, interaction of radiation with matter (spontaneous and stimulated emission), Einstein's relation, population inversion and pumping, Ruby LASER, He-Ne Laser and semiconductor Laser. CO3: Students will show that they have learned the basics of fiber optics, Holography and its applications. CO4: Students will be able to understand the significance and applications of Maxwell's equations. CO5: Students will be able to know about the short comings of classical physics and will learn various quantum mechanical principles. CO6: Student will be familiar with the essential concepts of Semiconductors materials technology and their applications in industries.	
7	Course Description	This course provides the basic foundation for understanding electronic semiconductor devices and their applications and limitations. It has introductory elements of various concept of material science. This course is essential for students who desire to specialize their engineering in Computer Sciences, Electronics, and Electronics and Electrical engineering.	
8	Outline Syllabus		CO Mapping
	Unit 1	**Semiconductor Physics**	
	A	Classification of Solids on the basis of energy band, electrons and holes concentration in intrinsic semiconductors, Fermi	CO1

		levels, Mobility, conductivity,	
	B	Donor and Acceptor impurities (n-type and p-type semiconductor), Drift and diffusion current, Hall effect,	CO1
	C	p-n junction, types of p-n junction (step-graded and Linearly-graded junction), formation of depletion region, barrier potential, Zener diode, Avalanche and Zener breakdown.	CO1, CO6
	Unit 2	**Laser Physics and optoelectronic Sources**	
	A	Coherent sources, interaction of radiation with matter (spontaneous and stimulated emission), Einstein's relation,	CO2
	B	population inversion and pumping, active components of laser, optical amplification or gain, threshold condition for laser action, Ruby and He-Ne lasers.	CO2, CO6
	C	Optoelectronic sources: Light emitting diode (construction, basic working principle), semiconductor laser (construction, basic working principle)	CO2, CO6
	Unit 3	**Fiber Optics and Holography**	
	A	Introduction, structure of optical fiber, Light guidance through optical fiber, Acceptance angle and Acceptance cone, Numerical aperture,	CO3
	B	Types of optical fibers, Attenuation and Dispersion in optical fiber, Applications of optical fibers.	CO3, CO6
	C	Basic principle of holography, Recording of holograms, Reconstruction process, Applications of holography.	CO3, CO6
	Unit 4	**Electromagnetism**	
	A	Gauss's theorem and its applications, Electric potential, and potential difference, Biot-Savart law and its application to current carrying circular loop	CO4
	B	Ampere's law and its applications to infinitely long straight wire, and solenoids. Electromagnetic induction; Faraday's law	CO4
	C	Maxwell's equations in free space and dielectric media, Electromagnetic waves.	CO4
	Unit 5	**Quantum Mechanics**	
	A	Inadequacy of classical Physics, Wave particle duality, de-Broglie wavelength,	CO5
	B	Davisson-Germer experiment, Schrodinger wave equation,	CO5, CO6
	C	particle in a 1-dimensional box, harmonic oscillator problem,	CO5, CO6
	Mode of Examination	Theory	
	Weightage Distribution	CA: 30% / MTE: 20% / ETE: 50%	
	Text books	Integrated Electronics- Millman - Halkias, Tata Mc Graw Hill	
	Other References	1. Semiconductor Devices Physics and Technology- S M Sze, John Wiley & Sons 2. Semiconductor physics and devices: basic principles- Donald A. Neamen.	

		3. Laser and non-linear optics by B.B. laud, New Age Int. 4. Semiconductor Devices- Kanaan Kano, Pearson Education. 5. Electronics devices and circuit theory by R.L. Boylestad, Pearson. 6. Introduction to Electrodynamics, David J. Griffiths, Pearson Cambridge University Press 7. Fundamentals of Electricity and Magnetism, D. N. Vasudeva, S. Chand & Co. New Delhi 8. Fundamentals of Physics, Halliday, Resnick and Walker, John Wiley. 9. Concepts of Modern Physics, Beiser Arthur, McGraw-Hill Education	

Instructional Plan

Academic Year: 2021

School: School of Basic Sciences and Research	**Subject:** Engineering Physics-I
Program: B.TECH	**Subject Code: PHY125**
Branch: CSE/EC/EEE	**Instructor:**

Scheme			**Scheme of Examination**		
L	P	T	Internal Assessment 30%	Mid Term Examination 20%	End Term Examination 50%
3	0	1			

Course Outline

In combination with basic knowledge of various concepts of semiconductors physics and electromagnetism and their applications. The course discusses profound knowledge of real life applications.

Course Evaluation	
Attendance	None
Homework	5 assignments (may vary) **5 Marks**
Quizzes	5 (may vary) **15 Marks**
Presentations	Can be a presentation/Study/MOOC etc. **10 Marks**
Labs	None
Any Other	None
References:	
Text book	Integrated Electronics- Millman - Halkias, Tata Mc Graw Hill
Other References	1. Semiconductor Devices Physics and Technology- S M Sze, John Wiley & Sons 2. Semiconductor physics and devices: basic principles- Donald A. Neamen. 3. Laser and non-linear optics by B.B. laud, New Age Int. 4. Semiconductor Devices- Kanaan Kano, Pearson Education. 5. Electronics devices and circuit theory by R.L. Boylestad, Pearson. 6. Introduction to Electrodynamics, David J. Griffiths, Pearson Cambridge University Press

	7. Fundamentals of Electricity and Magnetism, D. N. Vasudeva, S. Chand & Co. New Delhi 8. Fundamentals of Physics, Halliday, Resnick and Walker, John Wiley. 9. Concepts of Modern Physics, Beiser Arthur, McGraw-Hill Education
Software's	None

Session No.	Unit	Outline Syllabus	Evaluation Parameter	Pedagogy *
1	Unit 1 A	**Semiconductor Physics**		
2	A	Classification of Solids on the basis of energy band,		
3	A	Fermi levels, electrons and holes concentration in intrinsic semiconductors,		
4	B	p-n junction, types of p-n junction (step-graded and Linearly-graded junction), formation of depletion region, barrier potential, Zener diode, Avalanche and Zener breakdown.		
5	B	Mobility, conductivity, Donor and Acceptor impurities (n-type and p-type semiconductor), Drift and diffusion current		
6	B	Hall effect,		
7	C	p-n junction, types of p-n junction (step-graded and Linearly-graded junction),		
8	C	formation of depletion region, barrier potential,		
9	C	Zener diode, Avalanche and Zener breakdown.	I Assignment and 1 Quiz	
10	Unit 2 A	**Laser Physics and optoelectronic Sources**		
11	A	Coherent sources, interaction of radiation with matter (spontaneous and stimulated emission),		
12	A	Einstein's relation,		
13	B	population inversion and pumping, active components of laser, optical amplification or gain, threshold condition for laser action		
14	B	Ruby Laser		
15	B	He-Ne laser		
16	C	Optoelectronic sources: Light emitting		

		diode (construction, basic working principle),		
17	C	semiconductor laser (construction, basic working principle)	II Assignment and 2 Quiz	
18	Unit 3 A	**Fiber Optics and Holography**		
19	A	Introduction, structure of optical fiber		
20	A	Light guidance through optical fiber, Acceptance angle and Acceptance cone,		
21	B	Numerical aperture, Types of optical fibers		
22	B	Attenuation and Dispersion in optical fiber,		
23	B	Applications of optical fibers.		
24	C	Basic principle of holography, Recording of holograms,		
25	C	Reconstruction process,		
26	C	Applications of holography.	III Assignment and 3 Quiz	
27	Unit 4 A	**Introduction to Electrodynamics**		
28	A	Gauss's theorem and its applications,		
29	A	Electric potential, and potential difference,		
30	B	Biot-Savart law and its application to current carrying circular loop,		
31	B	Ampere's law and its applications to infinitely long straight wire, and solenoids.		
32	C	Electromagnetic induction; Faraday's law,		
33	C	Maxwell's equations in free space Electromagnetic waves.		
34	C	Maxwell's equations in dielectric media, Electromagnetic waves.	IV Assignment and 4 Quiz	
35	Unit 5 A	**Quantum Mechanics**: Inadequacy of classical Physics,		
36	A	Wave particle duality, de-Broglie wavelength,		
37	B	Davisson-Germer expriment,		
38	B	Schrodinger wave equation,		
39	C	particle in a 1 dimensional box,		
40	C	Harmonic Oscillator	V Assignment and 5 Quiz	

Mapping of Course Outcomes vs. Topics

Outcome no. → / Syllabus topic ↓	1	2	3	4	5	6
Unit 1 A	X					
Unit 1 B	X					
Unit 1 C	X					X
Unit 2 A		X				
Unit 2 B		X				X
Unit 2 C		X				X
Unit 3 A			X			
Unit 3 B			X			X
Unit 3 C			X			X
Unit 4 A				X		
Unit 4 B				X		
Unit 4 C				X		
Unit 5 A					X	
Unit 5 B					X	X
Unit 5 C					X	X

Mapping of CO Vs Pos:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
COPHYXXX.1	3	3	2	2	2	1	1	1	2	1	1	1
COPHYXXX.2	3	3	2	3	3	2	1	1	1	1	1	1
COPHYXXX.3	3	3	2	3	3	2	1	1	1	1	1	1
COPHYXXX.4	3	3	3	2	3	2	1	1	1	1	1	1
COPHYXXX.5	3	3	3	2	3	2	1	1	1	1	1	1
COPHYXXX.6	3	3	3	3	3	2	1	1	1	1	1	1

School: School of Engineering and Technology		**Batch: 2019-2023**	
Program: B.Tech.		**Current Academic Year: 2019-20**	
Branch: Physics		**Semester: I, II**	
1	Course Code	PHY 162	
2	Course Title	Physics Lab 2	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	To gain practical knowledge by applying the experimental methods to correlate with the Physics theory.	
6	Course Outcomes	On successful completion of the course the students will have: CO1: Knowledge and study of basic physics experiments based on Semiconductors, energy band gap, planck constant etc. CO2: Use the concept of electricity and magnetism to find out variation of magnetic field through a current carrying coil and hall effect CO3: Understand and learn how to determine specific resistance CO4: Understand and perform laser-based experiments. CO5: Knowledge and study of various optical experiments. CO6: Apply the mathematical concepts/equations to obtain quantitative results and ability to conduct, analyze and interpret experiments	
7	Outline Syllabus		CO Mapping
	Unit 1		
	A B C	1. To determine Energy band gap of a semiconductor using Four Probe method. 2. To determine the variation of magnetic field along the axis of a current carrying coil and estimate the radius of the coil. 3. To study Hall effect and determine the Hall coefficient, carrier density and the mobility of a semiconductor material	CO1 CO2,CO6
	Unit 2		
	A B C	4. To draw hysteresis curve (B-H curve) of a specimen in the form of a transformer on a C.R.O. And to determine its hysteresis loss 5. To determine the Planck's constant by measuring radiation in a fixed spectral range. 6. To determine the specific resistance of the material of a given wire using Carey Foster's bridge.	CO2,CO6
	Unit3		
	A B C	7. To determine the diameter of thin wire by diffraction using laser. 8. To determine the wavelength of laser light by diffraction at a single slit. 9. To determine slit width of single and double slit by using Laser.	CO3,CO6 CO4,CO6
	Unit 4		
	A	10. To determine the wavelength of prominent lines of	

	B C	mercury by plane diffraction grating. 11. To determine the wavelength of monochromatic light by Newton's Ring method.	CO4,CO6
	Unit 5		
	A B C	12. To determine the focal length of the combination of two lenses separated by a distance with the help of a nodal slide and to verify the formula. 13. To verify Stefan's Law.	CO5,CO6 CO5,CO6
	Mode of Examination	Practical/Viva	
	Weightage Distribution	CA: 60% / MTE: 0% / ETE: 40%	
	Text books	1. B.Sc. Practical Physics- Harnam Singh, S. Chand Publishing. 2. B.Sc. Practical Physics- C L Arora, S. Chand Publishing.	
	Other References	1. Geeta Sanon, BSc Practical Physics, 1st Edn. (2007), R. Chand & Co. 2. B. L. Worsnop and H. T. Flint, Advanced Practical Physics, Asia Publishing House, New	

Instructional Plan

Academic Year: 2019-20 (Odd Semester)

School: School of Engineering and Technology	**Subject: Physics Lab 2**
Program: B.Tech.	**Subject Code: PHY162**
Branch: Physics	**Instructor:**

Scheme			**Scheme of Examination**		
L	P	T	Internal Assessment	Mid Term Examination	End Term Examination
0	0	1	60%	0%	40%

Course Outline

The list of experiments provides closure between the theoretical results and experimental readings taken in the physics laboratory. The Demonstration of each and every experiment helps the students to take up data independently and work on various research problems of physics.

Course Evaluation	
Attendance	None
Any Other	CA judged on the practical conducted in the lab, weight age may be specified
References:	
Text book	1. B.Sc. Practical Physics- Harnam Singh, S. Chand Publishing. 2. B.Sc. Practical Physics- C L Arora, S. Chand Publishing.
Other References	1. GeetaSanon, BSc Practical Physics, 1st Edn. (2007), R. Chand & Co. 2. B. L. Worsnop and H. T. Flint, Advanced Practical Physics, Asia Publishing House, New
Softwares	None

Week 1	**Unit 1**	**Practical related to**	
	a, b, c	Lab expt. 1	To determine Energy band gap of a semiconductor using Four Probe method.
Week 2	**Unit 1**	**Practical related to--**	
	a, b, c	Lab expt. 1	To determine Energy band gap of a

			semiconductor using Four Probe method.
Week 3	**Unit 1**	**Practical related to—**	
	a, b, c	Lab expt. 2	To determine the variation of magnetic field along the axis of a current carrying coil and estimate the radius of the coil.
Week 4	**Unit 1**	**Practical related to--**	
	a, b, c	Lab expt. 3	To study Hall effect and determine the Hall coefficient, carrier density and the mobility of a semiconductor material.
Week 5	**Unit 2**	**Practical related to--**	
	a, b, c	Lab expt. 4	To draw hysteresis curve (B-H curve) of a specimen in the form of a transformer on a C.R.O. And to determine its hysteresis loss.
Week 6	**Unit 2**	**Practical related to--** **Unit 2**	
	a, b, c	Lab expt. 5	To determine the Planck's constant by measuring radiation in a fixed spectral range.
Week 7	**Unit 2**	**Practical related to--** **Unit 2**	
	a, b, c	Lab expt. 6	To determine the specific resistance of the material of a given wire using Carey Foster's bridge.
Week 8	**Unit 3**	**Practical related to--** **Unit 3**	
	a, b, c	Lab expt. 7	To determine the diameter of thin wire by diffraction using laser
Week 9	**Unit 3**	**Practical related to--** **Unit 3**	
	a, b, c	Lab expt. 8	To determine the wavelength of laser light by diffraction at a single slit.
Week 10	**Unit 3**	**Practical related to--** **Unit 3**	
	a, b, c	Lab expt. 9	To determine slit width of single and double slit by using Laser.
Week 11	**Unit 4**	**Practical related to--** **Unit 4**	
	a, b, c	Lab expt. 10	To determine the wavelength of prominent lines of mercury by plane diffraction grating.
Week 12	**Unit 4**	**Practical related to--** **Unit 4**	
	a, b, c	Lab expt. 11	To determine the wavelength of monochromatic light by Newton's Ring method.
Week 13	**Unit 4**	**Practical related to--** **Unit 4**	

	a, b, c	Lab expt. 11	To determine the wavelength of monochromatic light by Newton's Ring method.
Week 14	**Unit 5**	**Practical related to-- Unit 5**	
	a, b, c	Lab expt. 12	To determine the focal length of the combination of two lenses separated by a distance with the help of a nodal slide and to verify the formula.
Week 15	**Unit 5**	**Practical related to-- Unit 5**	
	a, b, c	Lab expt. 12	To determine the focal length of the combination of two lenses separated by a distance with the help of a nodal slide and to verify the formula.
Week 16	**Unit 5**	**Practical related to-- Unit 5**	
	a, b, c	Lab expt. 13	To verify Stefan's Law.

Mapping of Course Outcomes vs. Topics

Outcome no. → / Syllabus topic ↓	1	2	3	4	5	6
Unit 1 A	X					X
Unit 1 B	X					X
Unit 1 C		X				X
Unit 2 A		X				X
Unit 2 B		X				X
Unit 2 C		X				X
Unit 3 A			X			X
Unit 3 B			X			X
Unit 3 C				X		X
Unit 4 A				X		X
Unit 4 B				X		X
Unit 4 C				X		X
Unit 5 A					X	X
Unit 5 B					X	X
Unit 5 C					X	X

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO162.1	2	2	2	1	1	1	2	3	3	3	2	3	2
CO162.2	2	2	2	1	1	1	2	3	3	3	2	3	2
CO162.3	2	2	2	1	1	1	2	3	3	3	2	3	2
CO162.4	2	2	2	1	1	1	2	3	3	3	2	3	2
CO162.5	2	2	2	1	1	1	2	3	3	3	2	3	2
CO162.6	2	2	2	1	1	1	2	3	3	3	2	3	2

TERM-II

Schools: SET | SOL | SMFE | SBS-BBA | SBSR | SOE | SAP		Batch : 2021-22 Current Academic Year: 2021-2022 Semester: 2nd (Second)	
1	Course Code	ARP102	
2	Course Title	Communicative English -2	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
5	Course Objective	To Develop LSRW skills through audio-visual language acquirement, creative writing, advanced speech et al and MTI Reduction with the aid of certain tools like texts, movies, long and short essays.	
6	Course Outcomes	After completion of this course, students will be able to: CO1 Acquire Vision, Goals and Strategies through Audio-visual Language Texts CO2 Synthesize complex concepts and present them in creative writing CO3 Develop MTI Reduction/Neutral Accent through Classroom Sessions & Practice CO4 Determine their role in achieving team success through defining strategies for effective communication with different people CO5 Realize their potentials as human beings and conduct themselves properly in the ways of world. CO6 Acquire satisfactory competency in use of Quantitative aptitude and Logical Reasoning	
7	Course Description	The course takes the learnings from the previous semester to an advanced level of language learning and self-comprehension through the introduction of audio-visual aids as language enablers. It also leads learners to an advanced level of writing, reading, listening and speaking abilities, while also reducing the usage of L1 to minimal in order to increase the employability chances.	
8	Outline syllabus – ARP 102		
	Unit A	**Acquiring Vision, Goals and Strategies through Audio-visual Language Texts**	**CO Mapping**
	Topic 1	Pursuit of Happiness / Goal Setting & Value Proposition in life	CO1
	Topic 2	12 Angry Men / Ethics & Principles	

	Topic 3	The King's Speech / Mission statement in life | strategies & Action Plans in Life	
	Unit B	**Creative Writing**	
	Topic 1	Story Reconstruction - Positive Thinking	CO2
	Topic 2	Theme based Story Writing - Positive attitude	
	Topic 3	Learning Diary Learning Log – Self-introspection	
	Unit C	**Writing Skills 1**	
	Topic 1	Precis	CO2
	Topic 2	Paraphrasing	
	Topic 3	Essays (Simple essays)	
	Unit D	**MTI Reduction/Neutral Accent through Classroom Sessions & Practice**	
	Topic 1	Vowel, Consonant, sound correction, speech sounds, Monothongs, Dipthongs and Tripthongs	CO3
	Topic 2	Vowel Sound drills , Consonant Sound drills, Affricates and Fricative Sounds	
	Topic 3	Speech Sounds | Speech Music| Tone | Volume| Diction |Syntax |Intonation | Syllable Stress |	
	Unit E	**Gauging MTI Reduction Effectiveness through Free Speech**	
	Topic 1	Jam sessions	CO3
	Topic 2	Extempore	
	Topic 3	Situation-based Role Play	
	Unit F	**Leadership and Management Skills**	
	Topic 1	Innovative Leadership and Design Thinking	CO4
	Topic 2	Ethics and Integrity	CO4
	Unit F	**Universal Human Values**	
	Topic 1	Love & Compassion, Non-Violence & Truth	CO5
	Topic 2	Righteousness, Peace	CO5
	Topic 3	Service, Renunciation (Sacrifice)	CO5
	Unit G	**Introduction to Quantitative aptitude & Logical Reasoning**	
	Topic 1	Analytical Reasoning & Puzzle Solving	CO6
	Topic 2	Number Systems and its Application in Solving Problems	CO6
9	Evaluations	*Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations (60% CA and 40% ETE*	*N/A*
10	Texts & References | Library Links	• Wren, P.C.&Martin H. *High English Grammar and Composition*, S.Chand& Company Ltd, New Delhi. • Blum, M. Rosen. *How to Build Better Vocabulary*. London: Bloomsbury Publication • Comfort, Jeremy(et.al). *Speaking Effectively*. Cambridge University Press. The Luncheon by W.Somerset Maugham - http://mistera.co.nf/files/sm_luncheon.pdf	

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PS O1	PSO 2	PSO 3
ARP102.1	-	-	-	-	-	-	-	-	1	3	1	2	-	-	-
ARP102.2	-	-	-	-	-	-	-	-	1	3	1	2	-	-	-
ARP102.3	-	-	-	-	-	-	-	-	1	3	1	2	-	-	-
ARP102.4	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP102.5	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP102.6	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-

Syllabus for Application Based Programming in Python

School:		**School of Engineering and technology**	
Department		**Department of Computer Science and Engineering**	
Program:		**B.Tech.**	
Branch:		**CSE**	
1	Course Code	CSE114	
2	Course Title	Application Based Programming in Python	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	Emphasis is placed on procedural programming, algorithm design, and language constructs common to most high-level languages through Python Programming.	
6	Course Outcomes	Upon successful completion of this course, the student will be able to: CO1. Demonstrate program by using decision and repetition structures CO2. Construct programs by using Python lists, tuples and dictionaries CO3. Apply methods and functions to improve readability of programs. CO4. Develop logical problem using object-oriented programming methodology. CO5. Analyze and implement various tools, modules and packages for python. CO6. Design efficient logical solution for any given real life problem by using concise and efficient algorithms	
7	Course Description	Python is a language with a simple syntax, and a powerful set of libraries. It is widely used in many scientific areas for data exploration. This course is an introduction to the Python programming language for students without prior programming experience. We cover data types, control flow, object-oriented programming.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	CO1
	A	Python Environment, Variables, Data Types, Operators.	
	B	**Conditional Statements:** If, If- else, Nested if-else. **Looping:** For, While, Nested loops.	
	C	**Control Statements:** Break, Continue, And Pass. Comments	
	Unit 2	**List, Tuple and Dictionaries**	CO1, CO2
	A	**Lists and Nested List:** Introduction, Accessing list, Operations, Working with lists, Library Function and Methods with Lists	
	B	Strings: Introduction, Accessing items of a string, Operations, Working, Library Functions and Methods with strings. **Tuple:** Introduction, Accessing tuples, Operations, Working, Library Functions and Methods with Tuples.	
	C	Sets: Introduction, Operations, Working, functions with	

		sets. Difference between set and lists. **Dictionaries :**Introduction, Accessing values in dictionaries, Working with dictionaries, Library Functions	
	Unit 3	**Functions and Exception Handling**	CO3
	A	**Functions:** Defining a function, Calling a function, Types of functions, Function Arguments	
	B	Anonymous functions, Global and local variables	
	C	**Exception Handling**: Definition, Except clause, Try, finally clause, User Defined Exceptions	
	Unit 4	**OOP and File Handling**	CO4
	A	**OOPs concept** : Class and object, Attributes, Abstraction, Encapsulation, Polymorphism and Inheritance	
	B	Static and Final Keyword, Access Modifiers and specifiers, scope of a class	
	C	File Handling: Introduction, File Operations	
	Unit 5	**Application based programming**	CO5,CO6
	A	**Modules& packages :**Importing module, Math module, Random module, creating Modules	
	B	Introduction to Numpy, pandas, Matplotlib	
	C	**Applications: Searching Linear Search, Binary Search. Sorting: Bubble Sort**	
	Mode of examination	Theory	
	Weightage Distribution	CA: 30% / MTE: 20% / ETE: 50%	
	Text book/s*	The Complete Reference Python, Martin C. Brown, McGraw Hill	
	Other References	1. Introduction to computing in problem solving using Python, E Balahurusamy, McGraw Hill 2. Introduction to programming using Python, Y. Daniel Liang, Pearson 3. Mastering Python, Rick Van Hatten, Packet Publishing House 4. Starting out with Python, Tony Gaddis, Pearson	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1. Demonstrate program by using decision and repetition structures	PO1,PO2,PO3,PO8,PO12,PSO2
2.	CO2. Apply methods and functions to improve readability of programs.	PO1,PO2,PO3,PO4,PO8,PO12,PSO2,PSO3
3.	CO3. Construct programs by using Python lists, tuples and dictionaries	PO1,PO2,PO3,PO8,PO12,PSO1, PSO2,PSO3

4.	CO4. Develop logical problem using object-oriented programming methodology.	PO1,PO2,PO3, PO4,PO5,PO6,PO8, PO12,PSO1,PSO2,PSO3
5.	CO5. Analyze and implement various tools, modules and packages for python	PO1,PO2,PO3, PO4,PO5,PO6, PO8, PO12,PSO1,PSO2,PSO3
6.	CO6. Create efficient logical solution for any given real life problem by using concise and efficient algorithms.	PO1,PO2,PO3, PO4,PO5,PO6, PO8, PO12,PSO1,PSO2,PSO3

PO and PSO mapping with level of strength for Course Name Application Based Programming in Python (Course Code CSE 114)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE114_Application Based programming in Python	CO1	2	1	1					2				2		1	
	CO2	2	2	2	1				2				2		2	1
	CO3	2	2	1					2				2	1	2	1
	CO4	2	2	2	2	1	2		2				2	1	2	2
	CO5	2	2	2	2	3	2		2				2	2	2	1
	CO6	3	3	2	2	2	2		2				2	2	3	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE114	Application Based programming in Python	2.1	2	1.7	1.2	1	1	-	2	-	-	-	2	1	2	1.1

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

School: SET			
Program: B.Tech			
Branch: CSE / IT		**Semester: 2nd**	
1	Course Code	**CSP105** Course Name: Design & Creativity Lab	
2	Course Title	Design & Creativity Lab (DCL)	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
	Course Status	Compulsory	
5	Course Objective	4.To align student to think out of box and identify a realistic problem or project 5.To understand the significance of problem and its scope 6.To develop skills to frame small project for the defined problem	
6	Course Outcomes	Students will be able to: CO1: Identify and formulate problem statement using systematic approach for real world/proposed problem. CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others. CO3: Design the problem solution as per the problem statement framed. CO4: Classify and understand project solution and design solution parameters. CO5: Fabricate the solution by using C programming/other known programming. CO6: Develop future work areas from the project outcome.	
7	Course Description	In DCL, the students will learn the fundamental of defining the problem, formulating the problem statement, identifying the required skills for developing the solution based on given problem identified based on the understanding of programming language studied in previous semester or known.	
8	Outline syllabus		CO Mapping
	Unit 1	Problem Definition, Formation of Teamwork and problem solving and Project Assignment.	CO1, CO2
	Unit 2	Develop ability to communicate effectively and identify proposed problem.	CO2,CO3
	Unit 3	Design proposed solution for identified problem statement.	CO3
	Unit 4	Develop solution set under the guidance of a faculty member and obtain the appropriate results for defined parameters.	CO3, CO4
	Unit 5	Demonstrate and execute Project with the team. Determine future work based on final outcome.	CO4, CO5, CO6
		Report *should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, Solution Detail. Reports.*	

		References if any. The presentation, report, work done during the term supported by the documentation, forms the basis of assessment.			
	Mode of examination	Practical /Viva			
	Weight age Distribution	CA	MTE	ETE	
		60%	NA	40%	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1: Identify and formulate problem statement using systematic approach for real world/proposed problem.	PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
2.	CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others.	PO1, PO2, PO4, PO7, PO9, PO10, PO11, PO12 ,PSO3
3.	CO3: Design the problem solution as per the problem statement framed.	PO1, PO2, PO5, PO9, PO10, PO11, PO12, PSO1,PSO2
4.	CO4: Classify and understand project solution and design solution parameters.	PO1, PO2, PO6, PO9, PO10, PO11, PO12,PSO2
5.	CO5: Fabricate the solution by using C programming/other known programming.	PO1, PO2, PO3, PO4,PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12 PSO1,PSO2, PSO3
6.	CO6: Develop future work areas from the project outcome.	PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO3

PO and PSO mapping with level of strength for Course Name Design & Creativity Lab (Course Code CSP105)

CO/PO Mapping (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low															
Cos	Programme Outcomes(POs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	-	3	-	-	-	-	3	3	2	3	2	2	1
CO2	3	2	-	3	-	-	2	-	3	3	2	3			1
CO3	3	2	-	-	2	-	-	-	3	3	2	3	2	2	
CO4	3	3	-	-	-	2	-	-	3	3	2	3		2	
CO5	3	3	2	2	2	2	3	3	3	3	2	3	2	2	
CO6	3	3	-	3	-	-	-	-	3	3	2	3			1
AvgPO attained	3	2.7	0.34	1.84	0.67	0.67	0.84	0.5	3	3	2	3	1	1.4	0.5

School:		**School of Engineering and technology**	
Department		**Department of Computer Science and Engineering**	
Program:		**B.Tech.**	
Branch:		**CSE**	
1	Course Code	CSP114	
2	Course Title	Application Based Programming in Python Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	Emphasis is placed on procedural programming, algorithm design, and language constructs common to most high level languages through Python Programming.	
6	Course Outcomes	Upon successful completion of this course, the student will be able to: CO1: Develop program based on procedural statements like assignments, conditional statements and loops. CO2: Compare and implement different data types of python. CO3: Create programs by using function and function call. CO4: Formulate clear and accurate logical solution by using OOPS CO5: Apply different modules, packages available in python. CO6: Design real life situational problems and think creatively about solutions of them.	
7	Course Description	Python is a language with a simple syntax, and a powerful set of libraries. It is widely used in many scientific areas for data exploration. This course is an introduction to the Python programming language for students without prior programming experience. We cover data types, control flow, object-oriented programming.	
8	Outline syllabus		CO Mapping
	Unit 1	**Practical based on conditional statements and control structures**	
		1. Program to implement all conditional statements 2. Program to implement different control structures	CO1,C06
	Unit 2	**Practical related to List, Tuples and dictionaries**	
		1. Program to implement operations on lists 2. Program to implement operations on Dictionary **3.** Program to implement operations on Tuple	CO2,CO6
	Unit 3	**Practical related to Functions and Exception Handling**	

		1. Program to implement Exception Handling **2.** Program to use different functions	CO3,CO6
	Unit 4	**Practical related to Object Oriented Programming**	
		1. Program to use object oriented concepts like inheritance, overloading polymorphism etc. 2.Program for file handling	CO4,CO6
	Unit 5	**Practical related to Modules and Applications**	
		1.Program to use modules and package 2.Program to implement searching and sorting	CO5,CO6
	Mode of examination	Practical/Viva	
	Weightage Distribution	CA / MTE / ETE 60% / 0% / 40%	
	Text book/s*	2. The Complete Reference Python, Martin C. Brown, McGraw Hill	
	Other References	5. Introduction to computing in problem solving using Python, E Balagurusamy, McGraw Hill 6. Introduction to programming using Python, Y. Daniel Liang, Pearson 7. Mastering Python, Rick Van Hatten, Packet Publishing House 8. Starting out with Python, Tony Gaddis, Pearson	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Develop program based on procedural statements like assignments, conditional statements and loops.	PO1,PO2,PO3,PO4,PO8,PO12,PSO2
2.	CO2: Compare and implement different data types of python.	PO1,PO2,PO3,PO4,PO5,PO8,PO12,PSO2,PSO3
3.	CO3: Create programs by using function and function call.	PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO12, PSO1,PSO2,PSO3
4.	CO4: Formulate clear and accurate logical solution by using OOPS	PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO12, PSO1,PSO2,PSO3
5.	CO5: Apply different modules, packages available in python.	PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO12, PSO1,PSO2,PSO3
6.	CO6: Design real life situational problems and think creatively about solutions of them.	PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO12, PSO1,PSO2,PSO3

PO and PSO mapping with level of strength for Course Name-Application Based Programming in Python Lab **(Course Code CSP 114)**

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO 3
CSP114_Application Based programming in Python Lab	CO1	1	1	1	1				2				2		1	
	CO2	2	2	1	1	2			2				2		1	1
	CO3	2	2	1	1	1	1		2				2	1	2	1
	CO4	2	2	2	2	1	1		2				2	2	2	1
	CO5	2	2	2	2	2	2		2				2	2	2	2
	CO6	3	3	2	2	2	3		2				2	2	2	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CSP114	Application Based programming in Python Lab	2	2	1.5	1.5	1.3	1.2	-	2	-	-	-	2	1.2	1.7	1.2

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

School: SET		**Batch : 2018-2022**	
Program: B.Tech		**Current Academic Year: 2018-2019**	
Branch:		**Semester: I/II**	
1	Course Code	EEE112	
2	Course Title	Principles of Electrical and Electronics Engineering	
3	Credits	3	
4	Contact Hours (L-T-P)	2-1-0	
	Course Status	Compulsory	
5	Course Objective	To provide the students with an introductory concept in the field of electrical and electronics engineering to facilitate better understanding of the devices, techniques and equipments used in engineering applications.	
6	Course Outcomes	CO1: To analyze and solve basic electrical circuits CO3: To understand the working principle of transformer and identify its applications. CO3: To understand the working principle of dc and ac motors and identify the starting methods of single phase induction motor CO4: To apply the basics of diode to describe the working of rectifier circuits such as half and full wave rectifiers CO5: To apply the concepts of basic electronic devices to design various circuits CO6: Apply the basic concepts in Electrical and Electronics Engineering for multi-disciplinary tasks	
7	Course Description	This initial course introduces the concepts and fundamentals of electrical and electronic circuits and devices. Topics include basic circuit analysis, diode and transistor fundamentals and applications. This course also introduces working principle and applications of dc/ac motors and transformers.	
8	Outline syllabus		CO Mapping
	Unit 1	**DC & AC Circuits (6 lectures)**	
	A	Electrical circuit elements (R, L and C), series and parallel circuits, concept of equivalent resistance, Kirchhoff current and voltage laws, star-delta conversion	CO1,CO6
	B	Analysis of simple circuits with dc excitation and Superposition Theorem, Representation of sinusoidal waveforms, peak and rms values, real power, reactive power, apparent power, power factor	CO1,CO6
	C	Introduction to three phase system, relationship between phase voltages and line voltages,	CO1,CO6
	Unit 2	**Transformer(4 lectures)**	
	A	Working principle and construction of transformer, EMF equation	CO2,CO6
	B	Efficiency of transformer, Power and distribution transformer and difference between them	CO2,CO6
	C	Transformer applications in transmission and	CO2,CO6,

		distribution of electrical power	
	Unit 4	**Electrical Motors (6 lectures)**	
	A	Construction, working principle, torque-speed characteristic and applications of dc motor.	CO3,CO6
	B	Construction, working principle and applications of a three-phase induction motor, significance of torque-slip characteristic	CO3,CO6
	C	Working principle starting methods and applications of single phase induction motor	CO3,CO6
	Unit 4	**Semiconductor Diode and Rectifier (5 lectures)**	
	A	PN junction and its biasing	CO4,CO6
	B	Semiconductor diode, ideal versus practical diode , VI characteristics of diode	CO4,CO6
	C	Half wave and full wave rectifiers with and without filters.	CO4,CO6
	Unit 5	**Transistors (5 lectures)**	
	A	Bipolar Junction Transistor (BJT) – Construction, working principle and input-output characteristics	CO5,CO6
	B	BJT as CE amplifier and as a switch	CO5,CO6
	C	Introduction to JFET	CO5,CO6
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE 30% / 20% / 50%	
	Text book/s*	1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010. 2. S. K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson Publication. 3. Robert L Boylestad, "Electronic Devices and Circuit Theory" Pearson Education, 2009	
	Other References	1. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.	

Course Articulation Matrix:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO112.1	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO112.2	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-
CO112.3	2	2	1	-	-	-	-	-	--	-	-	-	-	-	-
CO112.4	2	1	2	-	-	-	-	-	-	-	1	-	-	-	-
CO112.5	3	2	1	-	-	-	-	-	-	-	1	-	-	-	-
CO112.6	2	2	3	1	-	-	-	-	-	-	1	-	-	-	-

INSTRUCTIONAL PLAN
Academic Year: 2018-22 (Odd Semester)

School: SET	**Subject: Principles of Electrical and Electronics Engineering**
Program: B.Tech	**Subject Code: EEE112**
Branch: Electrical and Electronics Engineering	**Instructor:**

Course Evaluation

Scheme			**Scheme of Examination**		
L	P	T	Internal Assessment	Mid Term Examination	End Term Examination
3	2	1	30%	20%	50%

Course outline
This initial course introduces the concepts and fundamentals of electrical and electronic circu and devices. Topics include basic circuit analysis, diode and transistor fundamentals a applications. This course also introduces working principle and applications of dc/ac motors a transformers.

Attendance	None
Homework	10 (Three Assignments)
Quizzes	15 (Three out of Four Quizzes)
labs	None
Presentations	5 (one)
References :	
Text book	1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010. 2. S. K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson Publication. 3. Robert L Boylestad, "Electronic Devices and Circuit Theory" Pearson Education, 2009
Other References	1. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.
Softwares	MATLAB MATLAB Simulink.

Session No.	**Unit**	**Outline syllabus**	**Evaluation Parameter**	**Pedagogy**
	I	**DC and AC Circuits (6)**		1. Power Point Presentations, videos through LCD Projector. 2. Use of white board
1	1a	Introduction to subject		
2	1a	Electrical circuit elements (R, L and C), series and parallel circuits, concept of equivalent resistance,		
3	1a	Kirchhoff current and voltage laws		
4	1a	star-delta conversion, Analysis of simple circuits with dc excitation, Superposition Theorem	Assignment I	
5	1b	Representation of sinusoidal waveforms, peak and rms values		

6	1c	Real power, reactive power, apparent power, power factor Introduction to three phase system, relationship between phase voltages and line voltages.	Assignment II and Quiz I	
	II	**Transformer(4 lectures)**		1. Power Point Presentations, videos through LCD Projector. 2. Use of white board
7	2a	Working principle and construction of transformer		
8	2a	EMF equation of transformer		
9	2b	Efficiency of transformer, Power and distribution transformer and difference between them		
10	2c	Transformer applications in transmission and distribution of electrical power	Quiz II	
	III	**Electrical Motors (6 lectures)**		
11	3a	Construction and working principle of dc motor		1. Power Point Presentations, videos through LCD Projector. 2. Use of white board
12	3a	Torque-speed characteristic and applications of dc motor.	Mid Term Examination	
13	3b	Construction of three phase induction motor		
14	3b	working principle and applications of a three-phase induction motor		
15	3c	significance of torque-slip characteristics		
16	3c	Working principle starting methods and applications of single phase induction motor	Quiz III	
	IV	**Semiconductor Diode and Rectifier (5 lectures)**		Videos through LCD Projectors and Use of White Board
17	4a	Introduction to PN junction diode		
18	4a	Biasing of PN junction diode		
19	4b	VI characteristics of diode, ideal versus practical diode		
20	4c	Half and full wave rectifiers without filters		
21	4c	Half and full wave rectifiers wit filters	Assignment III	
	V	**Transistors (5 lectures)**		Videos through LCD Projectors and Use of White Board
22	5a	Construction of BJT		
23	5b	Working Principle of BJT	Assignment IV	
24	5b	input-output characteristics of BJT		
25	5b	BJT as CE amplifier and as a switch		
26	5c	Introduction to JFET	Quiz IV	

School: SET		**Batch : 2018- 2021**	
Program: B.Tech.		**Current Academic Year: 2018-19**	
Branch: CSE		**Semester: II**	
1	Course Code	**MTH 145**	
2	Course Title	**Probability and Statistics**	
3	Credits	4	
4	Contact Hours (L-T-P)	3-1-0	
	Course Status	Compulsory	
5	Course Objective	The objective of this course is to familiarize the students with statistical techniques. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.	
6	Course Outcomes	CO1: Explain the concept of probability and Random Variable. (K2,K3, K4) CO2: Explain the concept of distribution functions, densities andprobability distributions; illustrate discrete and continuous probability distributions. (K1, K2, K3, K4) CO3: Describe the concept of moments, skewness and Kurtosis; evaluate correlation and regression – Rank correlation; discuss bivariate distributions and their properties . (K1, K2, K5) CO4: Discuss the basic of Curve fitting by the method of least squares; evaluate straight lines, second degree parabolas and more general curves. (K1, K2, K5) CO5: Describe and use the concepts test of significance: Large sample test for single proportion, difference of proportions; calculate single mean, difference of means, and difference of standard deviations. (K1,K2,K3) CO6: Explain the basic concepts of tests of small samples- Student's T test, Chi-square test for goodness of fit, and evaluate the result. (K2, K4, K5)	
7	Course Description	This course is an introduction to the fundamental of Mathematics. The primary objective of the course is to develop the basic understanding of statistics including measures of central tendency, correlation and regression, statistical methods of data sampling, probability and random variables and various discrete andcontinuous probability distributions and their properties.	
8	**Outline syllabus :Probability and Statistics**		**CO Mapping**
	Unit 1	**Basic Probability**	
	A	Probability spaces, conditional probability, Bayes' rule.	CO1
	B	Discrete random variables, Independent random variables	CO1

	C	Expectation of Discrete Random Variables, Chebyshev's Inequality	CO1
	Unit 2	**Discrete and Continuous Probability Distributions**	
	A	Discrete Probability distributions: Binomial, Poisson.	CO2
	B	Continuous random variables and their properties, distribution functions and densities.	CO2
	C	Normal, exponential and gamma distribution.	CO2
	Unit 3	**Statistics**	
	A	Moments, skewness and Kurtosis.	CO3
	B	Correlation and regression – Rank correlation.	CO3
	C	Bivariate distributions and their properties.	CO3
	Unit 4	**Applied Statistics**	
	A	Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves.	CO4, CO5
	B	Test of significance: Large sample test for single proportion,	CO4, CO5
	C	Difference of proportions, single mean, difference of means, and difference of standard deviations.	CO4, CO5
	Unit 5	**Testing Hypothesis**	
	A	Test for single mean, difference of means	CO6
	B	test for ratio of variances	CO6
	C	Chi-square test for goodness of fit and independence of attributes	CO6
	Mode of examination	Theory	
	Weightage Distribution	CA: 30% / MTE: 20% / ETE: 50%	
	Text book/s*	1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006. 2. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003 (Reprint). 3. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.	
	Other References	1. W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968. 2. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000. Veerarajan T., Engineering Mathematics (for semester	

		III), Tata McGraw-Hill, New Delhi, 2010.	

COURSE OUTCOMES – PROGRAMME OUTCOMES MAPPING TABLE

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C145.1	3	3	2	2	3	1	-	-	-	1	1	1
C145.2	3	2	3	2	2	2	-	-	-	1	1	2
C145.3	3	3	2	2	2	1	-	-	-	1	1	1
C145.4	3	2	2	2	2	1	-	-	-	1	1	1
C145.5	3	3	2	2	2	1	-	-	-	1	1	2
C145.6	3	3	2	3	2	2	-	-	-	1	1	2

TERM-III

School: SET		**Batch :** 2021-2022	
Program:		**Academic Year:** 2021-2022	
Branch: CSE		**Semester:** III	
1	Course Code	**ARP207**	Course Name : **Logical Skills Building and Soft Skills**
2	Course Title	**Logical Skills Building and Soft Skills**	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
	Course Status	Active	
5	Course Objective	To enhance holistic development of students and improve their employability skills. To provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To step up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a student will have entered the threshold of his/her 1st phase of employability enhancement and skill building activity exercise.	
6	Course Outcomes	After completion of this course, students will be able to: CO1: Ascertain a competency level through Building Essential Language and Life Skills CO2: Build positive emotional competence in self and learn GOAL Setting and SMART Goals techniques CO3: Apply positive thinking, goal setting and success-focused attitudes which would help them in their academic as well as professional career CO4: Acquire satisfactory competency in use of aptitude, logical and analytical reasoning CO5: Develop strategic thinking and diverse mathematical concepts through building number puzzles CO6: Demonstrate an ability to apply various quantitative aptitude tools for making business decisions	
7	Course Description	This Level 1 blended training approach equips the students for Industry employment readiness and combines elements of soft skills and numerical abilities to achieve this purpose.	
8	Outline syllabus – ARP 207		

	Unit 1	**BELLS (Building Essential Language and Life Skills)**	**CO Mapping**
	A	*Know Yourself*: Core Competence. A very unique and interactive approach through an engaging questionnaire to ascertain a student's current skill level to design, architect and expose a student to the right syllabus as also to identify the correct TNI/TNA levels of the student.	CO1
	B	Techniques of Self Awareness | Self Esteem & Effectiveness| Building Positive Attitude | Building Emotional Competence	CO1, CO2
	C	Positive Thinking & Attitude Building | Goal Setting and SMART Goals – Milestone Mapping | Enhancing L S R W G and P (Listening Speaking Reading Writing Grammar and Pronunciation) | Verbal Abilities - 1	CO1, CO2,CO3
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	
	A	Syllogism | Letter Series | Coding, Decoding , Ranking & Their Comparison Level-1	CO4
	B	Number Puzzles	CO5
	C	Selection Based On Given Conditions	CO5
	Unit 3	**Quantitative Aptitude**	
	A	Number Systems Level 1 | Vedic Maths Level-1	CO6
	B	Percentage ,Ratio & Proportion | Mensuration - Area & Volume |Algebra	CO6
	Weightage Distribution	*Class Assignment/Free Speech Exercises / JAM – 60% | Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand* | ***Quantum CAT – Arihant Publications*** | ***Quicker Maths- M. Tyra*** | *Power of Positive Action (English, Paperback, Napoleon Hill)* | *Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon* | *Goal Setting (English, Paperback, Wilson Dobson*	

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PS O1	PSO 2	PSO 3
ARP207.1	-	-	-	-	1	-	-	-	1	3	-	2	-	-	-
ARP207.2	-	-	-	-	1	-	-	-	1	3	-	2	-	-	-
ARP207.3	-	-	-	-	1	-	-	-	1	3	-	2	-	-	-
ARP207.4	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP207.5	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP207.6	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-

Syllabus: CSE242, Data Structures

School: SET		**Batch :**2019-23	
Program: B.Tech.		**Current Academic Year:** 2019-20	
Branch:CSE/IT		**Semester:**III	
1	Course Code	CSE242	
2	Course Title	Data Structures	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	1. Learn the basic concepts of Data Structures and algorithms. 2. Design and Implementation of Various Basic and Advanced Data Structures. 3. Learn the concepts of various searching, Sorting and Hashing Techniques. 4. Choose the appropriate data structures and algorithm design method for a specified application.	
6	Course Outcomes	CO1: **Select** appropriate data structures as applied to specified problem definition. CO2: **Choose** the suitable data structures like arrays, linked list, stacks and queues to solve real world problems efficiently. CO3 **Represent** and manipulate data using nonlinear data structures like trees and graphs to design algorithms for various applications. CO4: **Compare** various techniques for searching and sorting. CO5: **Design** and implement an appropriate hashing function for an application CO6: **Formulate** new solutions for programing problems or improve existing code using learned algorithms and data structures	
7	Course Description	This course starts with an introduction to data structures with its classification, efficiency of different algorithms, array and pointer based implementations and Recursive applications. As the course progresses the study of Linear and Non-Linear data structures are studied in details. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	
	A	Data Structure – Definition, Operations and Applications, Abstract Data Types, Algorithm – Definition, Introduction to Complexity, Big OH notation, Time and Space tradeoffs.	CO1
	B	Dynamic Memory Allocation(Malloc, calloc, realloc, free), Recursion – Definition, Examples- Tower of Hanoi problem, Tail Recursion	CO1
	C	Arrays: Implementation of One Dimensional Arrays, Multidimensional Arrays, Applications of Arrays, Address Calculation, Matrix Operations, Sparse martices	CO1

	Unit 2	**Linked List**			
	A	Concept of Linked List, Garbage Collection, Overflow and Underflow, Array Implementation and Dynamic Implementation of Singly Linked Lists			CO2
	B	Array Implementation and Dynamic Implementation of Doubly Linked List, Circularly Linked List			CO3
	C	Operations on a Linked List- Insertion, Deletion, Traversal, Polynomial Representation and Addition			CO2
	Unit 3	**Stack and Queue**			
	A	Stacks: Definitions, Primitive operations, Application of stacks – Conversion of Infix Expression to Postfix form, Evaluation of Postfix Expressions			CO3
	B	Queues: Definition, Primitive Operations, Implementation of Circular Queues, Priority Queues			CO3
	C	Deques, Application of Queues. Implementation - Linked Stacks, Linked Queues.			CO3
	Unit 4	**Tree and Graphs**			
	A	Trees: Terminologies, Binary tree, Representation, Applications, Binary search Tree – Operations on Binary Search Trees (Traversing, Insertion, deletion etc.), Binary Search Algorithm, AVL Tree			CO4, CO6
	B	Graph: Terminology, Representation, Traversals- Depth First Search, Breadth First Search.			CO4, CO6
	C	Graph Applications – Minimum Spanning Trees – Prim's and Kruskal's Algorithms			CO4, CO6
	Unit 5	**Searching, Sorting and Hashing**			
	A	Implementation and Analysis - Linear search, Binary Search			CO5, CO6
	B	Implementation and Analysis- Bubble Sort, Insertion Sort, Selection Sort, Tree sort			CO5, CO6
	C	Hashing: Concepts and Applications, Hash Functions, Collisions, Methods of Resolving Collisions			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Lipschutz, "Data Structures" Schaum's Outline Series, TMH			
	Other References	1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++" , PHI 2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication 3. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill 4. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education 5. G A V Pai, "Data Structures and Algorithms", TMH			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**Select** appropriate data structures as applied to specified problem definition.	PO1, PO3, PO9, PSO1, PSO2
2.	**Choose** the suitable data structures like arrays, linked list, stacks and queues to solve real world problems efficiently.	PO1, PO2, PO3, PO9, PSO1, PSO2, PSO3
3.	**Represent** and manipulate data using nonlinear data structures like trees and graphs to design algorithms for various applications.	PO1, PO2, PO3, PO4, PO9, PSO1, PSO2
4.	**Compare** various techniques for searching and sorting.	PO3, PO9, PO12, PSO1, PSO2
5.	**Design** and implement an appropriate hashing function for an application	PO1, PO2, PO3, PO4, PO5, PO9, PSO1, PSO2, PSO3
6.	**Formulate** new solutions for programing problems or improve existing code using learned algorithms and data structures	PO1, PO3, PO4, PO5, PO9, PSO1, PSO2, PSO3

PO and PSO mapping with level of strength for Course Name Data Structures (Course Code CSE 242)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	2	-	-	-	-	-	2	-	-	-	2	2	-
CO2	1	2	3	-	-	-	-	-	1	-	-	-	3	1	2
CO3	2	3	3	2	-	-	-	-	2	-	-	-	2	3	-
CO4	-	-	2	-	-	-	-	-	3	-	-	1	2	2	-
CO5	3	2	3	2	1	-	-	-	2	-	--	-	3	2	2
CO6	2	-	3	3	2	-	-	-	1	-	-	-	2	3	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CSE 242	Data structures	2	2.33	2.67	2.33	1.5	-	-	-	1.83	-	-	1	2.33	2.17	2.33

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

Syllabus: CSE 245, Discrete Structures

School:SET		**Batch:2019-20**	
Program: B.Tech		**Current Academic Year:2019-20**	
Branch:CSE		**Semester:**	
1	Course Code	CSE245	Course Name: Discrete Structures
2	Course Title	Discrete Structures	
3	Credits	4	
4	Contact Hours(L-T-P)	3-1-0	
	Course Status		
5	Course Objective	This course provides a mathematical foundation for subsequent study in Computer Science, as well as developing the skills necessary to solve practical problems.	
6	Course Outcomes (CO)	After the completion of this course, students will be able to: CO-1. ***Apply the*** basic principles of sets and operations in sets**.** CO-2. ***Classify*** logical notation and determine if the argument is or is not valid. CO-3. ***Construct*** and prove models by using algebraic structures. CO-4. ***Analyze*** basic principles of Boolean algebra with mathematical description. CO-5. ***Construct*** Permutations and combinations in counting techniques and applications of Graph Theory. CO-6. ***Compose*** computer programs in a formal mathematical manner.	
7	**Prerequisite**	Concepts of algebra	
8	**Course Contents**		CO-Mapping
	Unit 1	**Introduction to Set Theory, Relations and Functions.**	
	A	Set Theory: Introduction, Combination of sets, Multi sets, ordered pairs, Set Identities.	CO1
	B	Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality of relations, Order of relations.	CO1
	C	Functions: Definition, Classification of functions, Operations on functions, Recursively defined functions.	CO1
	Unit 2	**Logics and Mathematical Induction**	
	A	Propositional Logic: Proposition, well formed formula, Truth tables, Tautology, Satisfiability, Contradiction, Algebra of proposition, Theory of Inference, Natural Deduction.	CO1,CO2
	B	Predicate Logic: First order predicate, well formed formula of predicate, quantifiers, Inference theory of predicate logic.	CO1,CO2
	C	Natural Numbers: Introduction, Mathematical Induction, Variants of Induction, Induction with Nonzero Base cases.	CO1,CO2
	Unit 3	**Algebraic Structures**	
	A	Definition, Groups, Subgroups and order, Cyclic Groups, Cosets, Lagrange's theorem, Normal Subgroups,	CO3
	B	Homomorphism's, Definition and elementary properties of Rings and Fields, Integers Modulo n.	CO3
	C	Partial order sets: Definition, Partial order sets, Combination of partial order sets, Hasse diagram.	CO3

	Unit 4	**Lattices and Applications**	
	A	Definition, Properties of lattices – Bounded, Complemented, Modular and Complete Lattice, Morphisms of lattices.	CO4
	B	Boolean Algebra: Introduction, Axioms and Theorems of Boolean algebra, Algebraic manipulation of Boolean expressions. Simplification of Boolean Functions, Karnaugh maps, Logic gates, Digital circuits and Boolean algebra. Combinational and sequential Circuits.	CO4
	C	Recurrence Relation & Generating function: Recursive definition of functions, Recursive algorithms, Method of solving recurrences.	CO4
	Unit 5	**Graph Theory and Applications.**	
	A	Trees: Definition, Binary tree, Binary tree traversal, Binary search tree.	CO4,CO5
	B	Graphs: Definition and terminology, Representation of graphs, Multi graphs, Bipartite graphs, Planar graphs, Isomorphism and Homeomorphism of graphs, Euler and Hamiltonian paths, Graph colouring.	CO4,CO5
	C	Combinatory: Introduction, Counting Techniques, Pigeonhole Principle	CO4,CO5
	Mode of examination	Theory	
	Weightage Distribution	CA: 30%	MTE: 20%	ETE: 50%
	Text book*	1) *1. C. L. Liu, Elements of Discrete Mathematics, second edition 1985, McGraw-Hill Book Company. Reprinted 2000.* 2) Jean Paul Trembley, R Manohar, "Discrete Mathematical Structures with Application to Computer Science", McGraw-Hill. 3) *K. H. Rosen, Discrete Mathematics and applications, fifth edition 2003, Tata McGraw Hill Publishing Company.*	
	other references	1) *J .L. Mott, A. Kandel, T.P .Baker, Discrete Mathematics for Computer Scientists and Mathematicians, second edition 1986, Prentice Hall of India.* 2) *W.K. Grassmann and J.P.Trembnlay, Logic and Discrete Mathematics, A Computer Science*	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**CO1:** ***Apply the*** basic principles of sets and operations in sets**.**	**PO1,PO2,PO3,PO4,PO6,PO12, PSO1,PSO2**
2.	**CO2:** ***Classify*** logical notation and determine if the argument is or is not valid.	**PO1,PO2,PO3,PO6,PO9,PO12 PSO1,PSO2**
3.	**CO3:** ***Construct*** and prove models by using algebraic structures.	**PO1,PO2,PO3,PO4,PO5,PO9,PSO2 PSO3**
4.	**CO4:** ***Analyze*** basic principles of Boolean algebra with mathematical description.	**PO1,PO2,PO3,PO4,PO5,PO11,PO1 2 PSO1, PSO3**
5.	**CO5:** ***Construct*** Permutations and combinations in counting techniques and applications of Graph Theory.	**PO1,PO2,PO3,PO4,PO6,PO9,PO11, PO12, PSO2,PSO3**

6	**CO6:** ***Compose*** computer programs in a formal mathematical manner.	**PO1,PO2,PO3, PO4, PO5,PO9,PO11, PSO1,PSO2,PSO3**

PO and PSO mapping with level of strength for Course Name Discrete Structures (Course Code CSE245)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	2	3	3	1	_	3	_	_	3	_	_	3	3	3	_
CO2	2	2	3	_	_	2	_	_	_	_	_	3	3	2	_
CO3	3	2	3	3	3	_	_	_	2	_	_	_	_	3	2
CO4	2	2	3	3	3	_	_	_	_	_	3	3	3	_	3
CO5	2	2	2	3	_	3	_	_	3	_	3	3	_	2	3
CO6	1	2	1	2	3	_	_	_	3	_	3	_	3	3	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE245	DS	2	2.1	2.5	2	1.5	1.3	0	0	1.8	0	1.8	2	2	2.1	1.6

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***

3. Addressed to ***Substantial (High=3) extent***

Syllabus: CSE 247, Computer organization and architecture

School: SET		**Batch: 2019-2023**	
Program: B.Tech		**Current Academic Year: 2019-2020**	
Branch: CSE/IT		**Semester: III**	
1	Course Code	CSE247 Course Name	
2	Course Title	Computer Organization and Architecture	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Compulsory	
5	Course Objective	To impart an understanding of the internal organization and operations of a computer and to introduce the concepts of processor logic design and control logic design.	
6	Course Outcomes	Upon successful completion of this course, the student will be able to: **CO1:** Identify the basic structure and functional units of a digital computer CO2:Study the architecture of Bus and registers . **CO3:**Study the design of arithmetic and logic unit and implementation of fixed point and floating-point arithmetic operations **CO4:**Understand basic processing unit and organization of simple processor including instruction sets, instruction formats and various addressing modes **CO5:**Study the two types of control unit techniques **CO6:** Describe hierarchical memory systems including cache memories and select appropriate interfacing standards for I/O devices.	
7	Course Description	This course discusses the basic structure of a digital computer and used for understanding the organization of various units such as control unit, Arithmetic and Logical unit and Memory unit and I/O unit in a digital computer.	
8	Outline syllabus		CO Mapping
	Unit 1	**Computer Organization and Design**	
	A	Functional units of digital system and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register bus and memory transfer	CO1
	B	Register transfer Language, Registertransfer, Bus & memory transfer, Logic micro operations, Shift micro operation.	CO1
	C	Adder-Subtractor- Incrementor, Arithmetic unit, Logic unit.	CO1
	Unit 2	**Computer Arithmetic**	
	A	Representation of numbers in 1's and 2's complement, Addition and subtractionofsigned numbers.	CO1, CO2
	B	Binary Multiplier, Multiplication: Signed operand multiplication, Booth algorithm	CO1, CO2
	C	Floating point arithmetic representation: addition and subtraction.	CO1, CO2
	Unit 3	**Processor Organization**	
	A	General register organization, stack organization	CO3
	B	Instruction set architecture of a CPU - registers, Instruction types, formats, instruction execution cycle	CO3
	C	Addressing modes, RISC/CISC	CO3

	Unit 4	**Control Unit**			
	A	Introduction to CPU design, Instruction interpretation and execution, Micro-operation and their register transfer language (RTL) specification			CO3, CO4
	B	Hardwired control CPU design			CO3, CO4
	C	Microprogrammed control CPU design			CO3, CO4
	Unit 5	**Memory and I/O**			
	A	RAM/ROM/Flash memory, Designing Memory System using RAM and ROM chips			CO1, CO5
	B	Cache memory: Memory hierarchy, performance Considerations, mapping techniques			CO1, CO5
	C	Input Output: Isolated vs. Memory mapped I/O, Programmed I/O, Interrupt driven I/O, Direct Memory Access			CO1, CO5
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. M. Morris Mano, Computer System Architecture, Pearson			
	Other References	1. C. Hamacher, Z. Vranesic and S. Zaky, "Computer Organization", McGrawHill, 2002. 2. W. Stallings, "Computer Organization and Architecture - Designing for Performance", Prentice Hall of India, 2002. 3. D. A. Patterson and J. L. Hennessy, "Computer Organization and Design - The Hardware/Software Interface", Morgan Kaufmann,1998. 4. J.P. Hayes, "Computer Architecture and Organization", McGraw-Hill, 1998.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1. Identify the basic structure and functional units of a digital computer.	PO1, PO2, PO3, PO6, PO12, PSO3
2.	CO2:Study the architecture of Bus and registers	PO1, PO2, PO3, PO6, PO12, PSO3
3.	CO3. Study the design of arithmetic and logic unit and implementation of fixedpoint and floating-point arithmetic operations	PO1, PO2, PO3, PO6, PO12, PSO3
4.	CO4. Understand basic processing unit and organization of simple processor including instruction sets, instruction formats and various addressing modes	PO1, PO2, PO3, PO6, PO12, PSO3
5.	CO5. Study the two types of control unit techniques	PO1, PO2, PO3, PO4, PO6, PO12, PSO2, PSO3
6.	CO6. Describe hierarchical memory systems including cache memories and select appropriate interfacing standards for I/O devices	PO1, PO2, PO3, PO6, PO12, PSO2, PSO3

PO and PSO mapping with level of strength for Course Name Computer Organization and Architecture **(Course Code CSE 247)**

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CSE247	CO1	3	1	1	-	-	2	-	-	-	-	-	2	-	1	3
	CO2	3	3	3	-	-	3	-	-	-	-	-	3	-	2	3
	CO3	3	2	3	-	-	2	-	-	-	-	-	3	-	2	3
	CO4	3	2	2	-	-	1	-	-	-	-	-	3	-	3	2
	CO5	3	3	3	-	-	2	-	-	-	-	-	3	-	2	2
	CO6	3	3	3	-	-	2	-	-	-	-	-	3	-	1	2

1-Slight (Low) **2-Moderate (Medium)** **3-Substantial (High)**

Syllabus: CSP 242, Data Structure Lab

School: SET		**Batch: 2019-2023**	
Program: B.Tech.		**Current Academic Year: 2019-2020**	
Branch: CSE/IT		**Semester: III**	
1	Course Code	CSP242	
2	Course Title	Data Structure Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	1. Learn the basic concepts of Data Structures and algorithms. 2. Design and Implementation of Various Basic and Advanced Data Structures. 3. Learn the concepts of various searching, Sorting and Hashing Techniques. 4. Choose the appropriate data structures and algorithm design method for a specified application.	
6	Course Outcomes	CO1: **Implement** operation like traversing, insertion, deletion, searching etc. on various data structures. CO2 **apply** linear data structure(s) to solve various problems CO3: **develop** the solution of any problem using non linear data structure(s) CO4: **create** a solution of any problem using searching and sorting techniques CO5: **Design** a hash function using any programming language CO6: **Choose** the most appropriate data structure(s) for a given problem	
7	Course Description	This course starts with an introduction to data structures with its classification, efficiency of different algorithms, array and pointer based implementations and Recursive applications. As the course progresses the study of Linear and Non-Linear data structures are studied in details. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	**CO1**
		Program to implement Operation on Array such as Traversing, Insertion & Deletion operation	**CO1**
		Program based on Recursion such as Towers of Hanoi, Fibonacci series etc.	CO1
	Unit 2	**Linked List**	**CO2**
		Program to implement different operation on the following linked list: Singly, Doubly and circular linked list.	CO2
	Unit 3	**Stack & Queue**	**CO3**
		Program to Implement Stack operation using Array and	**CO3**

		Linked list			
		Program to convert infix expression to post fix expression			**CO3**
		Program on Evaluation of Post fix expression			**CO3**
		Program to implement queue operation using array and linked list			**CO3**
		Program to implement circular queue and deque.			**CO3**
	Unit 4	**Tree & Graph**			**CO4, CO6**
		Program to implement binary tree and BST.			**CO4, CO6**
		Program to implement MST and shortest path algorithm.			CO4, CO6
	Unit 5	**Searching, Sorting & Hashing**			**CO5**
		Program on Searching and Hashing			**CO5**
		Program on Sorting.			CO5
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1. Lipschutz, "Data Structures" Schaum's Outline Series, TMH			
	Other References	1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++" , PHI 2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication 3. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill 4. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education 5. G A V Pai, "Data Structures and Algorithms", TMH			

PO and PSO mapping with level of strength for Course Name Data Structures (Course Code CSE 242)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	**2**	**2**	**3**	**_**	**_**	**-**	**_**	**_**	**3**	**_**	**_**	**2**	**3**	**2**	**2**
CO2	**3**	**2**	**2**	**2**	**2**	**-**	**_**	**_**	**2**	**_**	**-**	**_**	**2**	**3**	**3**
CO3	**3**	**1**	**3**	**3**	**_**	**_**	**_**	**_**	**3**	**_**	**_**	**1**	**3**	**2**	**2**
CO4	**3**	**2**	**3**	**2**	**_**	**_**	**_**	**_**	**2**	**_**	**_**	**2**	**2**	**3**	**2**
CO5	**2**	**2**	**2**	**_**	**_**	**_**	**_**	**_**	**_**	**_**	**_**	**_**	**1**	**2**	**2**
CO6	**3**	**3**	**2**	**3**	**-**	**-**	**_**	**_**	**3**	**_**	**-**	**_**	**2**	**3**	**2**

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CSP 242	Data structures Lab	2.67	2	2.5	2.5	2	-	-	-	2.6	-	-	1.7	2.17	2.5	2.2

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

School:		**School of Engineering and technology**			
Department		**Department of Computer Science and Engineering**			
Program:		**B.Tech**			
Branch:		**CSE**			
1	Course Code	CSP243			
2	Course Title	Object Oriented Programming Using Java Lab			
3	Credits	1			
4	Contact Hours (L-T-P)	0-0-2			
	Course Status	Compulsory/Elective			
5	Course Objective	To learn Java language syntax and semantics and concepts such as classes, objects, inheritance, polymorphism, packages and multithreading.			
6	Course Outcomes (must be 6 COs, following verbs given in Bloom's Taxonomy)	CO1. Define Object oriented programming concepts by identifying classes, objects, members of a class and relationships among them needed for a specific problem. CO2: Illustrate different features of java. CO3: Develop Java programs to solve problems of applications using OOP principles such as abstraction, polymorphism and inheritance. CO4:Categorize runtime errors thrown in the application software or generated runtime by applying the methods of exception handling and File I/O CO5. Explain the concept of multithreading. CO6. Design real life application using Java			
7	Course Description	Basic Object Oriented Programming (OOP) concepts including objects, classes, methods, parameter passing, information hiding, inheritance and polymorphism are discussed.			
8	Outline syllabus				CO Mapping
	Unit 1	**Introduction to Object Oriented Paradigm**			
		Program related to garbage collection and OOPS			CO1,CO2
	Unit 2	**Introduction to Java**			
		Program to take input from user, decision making and branching			CO1,CO2
	Unit 3	**Polymorphism**			
		Program related to string handling and polymorphism			CO1,CO2
	Unit 4	**Inheritance, package and Interface Inheritance Implementation**			
		Program related to inheritance and interfaces			CO2,CO3,CO6
	Unit 5	**Exception and Multithreading**			
		Program related to exception handling			CO4,CO6
	Mode of examination	Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1.Schildt H, "The Complete Reference JAVA2", TMH			
	Other	1. Balagurusamy E, "Programming in JAVA", TMH			

	References	Professional Java Programming: BrettSpell, WROX Publication	

PO and PSO mapping with level of strength for Course Name Object Oriented Programming Using Java **(Course Code CSP243)**

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3
CSP243_ Object Oriented Programming Using Java Lab	CO1					2							2			
	CO2					2										
	CO3	2	3	3		2				3			2	2	3	
	CO4					2										
	CO5					2										
	CO6	3	3	3		2	3	2		3		2	3	3	3	2

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

List of Experiments

Unit No	S.No	Name of the Practical
1	1.1	Write a Java program to print 'Hello' on screen and then print your name on a separate line
	1.2	Write a Java program to print the sum (addition), multiply, subtract, divide and remainder of two numbers.
2	2.1	Write a Java program to accept a number and check the number is even or not. Prints 1 if the number is even or 0 if the number is odd.
	2.2	Write a Java program that accepts three integers from the user and return true if the second number is greater than first number and third number is greater than second number. If "abc" is true second number does not need to be greater than first number.
3	3.1	Write a Java program to find the maximum occurring character in a string
	3.2	Write a Java program to find first non repeating character in a string.
	3.3	Write a program in java to demonstrate method overloading
4	4.1	Write a program in java to demonstrate multilevel inheritance in java.
	4.2	Write a java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.
5	5.1	Write a program that creates a user interface to perform integer division. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 and Num2 were not integers, the program would throw a Number Format Exception. If Num2 were zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

	5.2	Write a java program that implements a multi-thread application that has three threads. First hread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number

Syllabus: CSP 244, Principles of Operating System Lab

School: SET		**Batch: 2018**	
Program: B.Tech		**Current Academic Year: 2018-19**	
Branch: CSE		**Semester: IV**	
1	Course Code	**CSP 244**	
2	Course Title	Principles of operating System Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status		
5	Course Objective	Introduces different type operating systems, functions of operating systems, working in a Unix/Linux and Windows system, writing programs on Process management and file management.	
6	Course Outcomes	CO1: Working with single user multi task and multi-user multi-tasking environment. CO2: Identify and use utilities of Windows & Unix operating systems CO3: Use the resources of operating system i.e. process management and file management CO4: Writing programs on Process creation, multiple process creation, process synchronization, CO5: Writing program on basic file operations CO6: Writing program on file buffering.	
7	Course Description	The course is designed to make the students research/industry ready as operating systems are indispensable for the systems used in industries/research organizations. New operating systems for different gadgets are launched in last few years. So the students will get the design principles operating system in this course.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	
		Illustration of Different types of operating system: Single user Multi task, Multi user Multi task	CO1
		Basic Windows features & Unix commands.	CO2
	Unit 2	**Processes**	
		Process basics: Creating processes using fork( ), the parent-child processes PID, PPID, process states: creating orphan, zombie processes.	CO2, CO3, CO4
	Unit 3	**Process Synchronization**	
		Creating multiple processes, Process table, use the command ps with –el, Synchronization of processes by using sleep( ) & wait( ), background process,	CO3, CO4
	Unit 4	**Files**	
		Basic file operations, Programs for File operations, sharing data between processes using files.	CO3, CO4,CO5
	Unit 5	**File Buffering**	

		File descriptor table, system file table, file pointer, buffer accessing block wise, use the functions: fopen( ), fread( ), ftell( ), lseek( ), fflush( ) etc.			CO3, CO4,CO6
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1. Sumitabha Das, "Unix Concepts and Applications", Tata McGraw Hill.			
	Other References	1. Unix: The complete Reference, Kenneth Rosen et.al., TMH 2. Unix 'C' Odessey, Meeta Gandhi et.al. BPB			

Course outline
This course introduces the features of GUI i.e. Windows operating system as well as the CUI i.e. the commands used in Unix, so that the students will be familiar with both GUI & CUI environment of operating systems. As the course progresses the students will learn to write programs for process management and file operations. Further the students can implement the algorithms studied in theory by writing programs using the above principles and skills.

Course Evaluation	
Attendance	None
Any other	CA judged on the practical conducted in the lab , weightage may be specified
References	
Text book	1. Sumitabha Das, "Unix Concepts and Applications", Tata McGraw Hill.
Other References	1. Unix: The complete Reference, Kenneth Rosen et.al., TMH 2. Unix 'C' Odessey, Meeta Gandhi et.al. BPB
Software	Windows, Unix / Any Unix family OS i.e. Linux

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Working with single user multi task and multi-user multi-tasking environment.	PO1,PO2,PO3,PO4,PSO1
2.	CO2: Identify and use utilities of Windows & Unix operating systems	PO1, PO3, PO4, PSO2
3.	CO3: Use the resources of operating system i.e. process management and file management	PO1,PO2,PO3,PO4
4.	CO4: Writing programs on Process creation, multiple process creation, process synchronization,	PO9, PO10,PO11, PSO3
5.	CO5: Writing program on basic file operations	PO1,PO2,PO8,PO9,PO10,PSO1

6.	CO6: Writing program on file buffering.	PO1,PO2,PO10,PO11,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Principles of Operating System (Course Code CSP 244)

CSE244	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
	CO1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2
	CO2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2
	CO3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1
	CO4	2	2	2	2	1	--	--	2	3	3	3	1	2	2	2
	Co5	2	2	3	-	-	-	-	3	3	1	2	-	3	-	-
	CO6	3	2	-	-	-	-	-	-	-	2	3	-	2	2	-

School: SET			
Program: B.tech			
Branch: CSE / IT		**Semester: 3rd**	
1	Course Code	**CSP254** Course Name: Project Based Learning -1	
2	Course Title	Project Based Learning -1	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course Objective	7.To align student's skill and interests with a realistic problem or project 8.To understand the significance of problem and its scope 9.Students will make decisions within a framework	
6	Course Outcomes	Students will be able to: CO1: Identify and formulate problem statement with systematic approach. CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others. CO3: Design the problem solution as per the problem statement framed. CO4: Classify and understand techniques for software verification and validation of project successfully. CO5: Fabricate and implement the solution by using different aspects of programming language. CO6: Develop a glory of the need to engage in life-long learning.	
7	Course Description	In PBL-1, the students will learn how to define the problem for developing projects, identifying the skills required for developing the project based on given a set of specifications and all subjects of that Semester.	
8	Outline syllabus		CO Mapping
	Unit 1	Problem Definition, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any.	CO1, CO2
	Unit 2	Develop a work flow or block diagram for the proposed system / software.	CO2,CO3
	Unit 3	Design algorithms for the proposed problem.	CO3
	Unit 4	Implementation of work under the guidance of a faculty member and obtain the appropriate results.	CO3, CO4
	Unit 5	Demonstrate and execute Project with the team. Validate and verify the project modules.	CO4, CO5, CO6
		Report should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, Implementation Detail. Validation Reports. References if any. The presentation, report, work done during the term supported by the documentation, forms the basis of	

		assessment.			
	Mode of examination	Practical /Viva			
	Weight age Distribution	CA	MTE	ETE	
		60%	NA	40%	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1: Identify and formulate problem statement with systematic approach.	PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
2.	CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others.	PO1, PO2, PO4, PO7, PO9, PO10, PO11, PO12 ,PSO3
3.	CO3: Design the problem solution as per the problem statement framed.	PO1, PO2, PO5, PO9, PO10, PO11, PO12, PSO1,PSO2
4.	CO4: Classify and understand techniques for software verification and validation of project successfully.	PO1, PO2, PO6, PO9, PO10, PO11, PO12,PSO2
5.	CO5: Fabricate and implement the solution by using different aspects of programming language.	PO1, PO2, PO3, PO4,PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12 PSO1,PSO2, PSO3
6.	CO6: Develop a glory of the need to engage in life-long learning.	PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO3

PO and PSO mapping with level of strength for Course Name Project Based Learning -1 (Course Code CSP254)

CO/PO Mapping

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

Cos	Programme Outcomes(POs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	3	-	-	-	-	3	3	2	3	2	2	1
CO2	3	2	-	3	-	-	2	-	3	3	2	3			1
CO3	3	2	-	-	2	-	-	-	3	3	2	3	2	2	
CO4	3	3	-	-	-	2	-	-	3	3	2	3		2	
CO5	3	3	2	2	2	2	3	3	3	3	2	3	2	2	
CO6	3	3	-	3	-	-	-	-	3	3	2	3			1
Avg PO attained	3	2.7	0.34	1.84	0.67	0.67	0.84	0.5	3	3	2	3	1	1.4	0.5

School: SET			
Program: B.tech			
Branch: CSE / IT		**Semester: 3rd**	
1	Course Code	**CSP292**	Course Name: Summer Internship-I
2	Course Title	Summer Internship-I	
3	Credits	2	
4	Contact Hours (L-T-P)		
	Course Status	Compulsory	
5	Course Objective	This course will expose students to apply theories learned in the classroom and provides current technological developments relevant to the subject area of training. Students will be able to identify the career preferences and professional goals.	
6	Course Outcomes	Students will be able to: CO1: Get familiarize with industry principles and practices. CO2: Identify and analyze an appropriate problem. CO3: Develop teamwork and apply prior acquired knowledge in problem solving. CO4: Demonstrate effective verbal and written communication skills. CO5: Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards. CO6: Identify the career preferences and professional goals.	
7	Course Description	The Internship aims to offer students the opportunity to apply their prior acquired knowledge in problem solving. Students will acquire skills important for time management, discipline, self learning, and effective communication and so on.	
8	Outline syllabus		CO Mapping
	Unit 1	Define objectives and conditions for the internship, ensuring students that it is related to the study path carried out at the University	CO1,CO6
	Unit 2	Problem Definition and identification, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any.	CO2,CO6,
	Unit 3	The internship work plan is drawn up by developing team work and applies prior acquired knowledge in problem solving.	CO3,CO6,
	Unit 4	Demonstrate and execute Project with the team. Submission of evaluation form and final report completed by the intern.	CO4,CO6
	Unit 5	Final evaluation form completed by the supervisor at the Host Organization and final presentation before departmental committee.	CO5,CO6
	Mode of examination	Theory	
	Weight age	CA	MTE

	Distribution				
		60%			NA
	Text book/s* Other References			ETE	
				40%	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1: Get familiarize with industry principles and practices.	PO1
2.	CO2: Identify and analyze an appropriate problem.	PO2,PO3,PO5,PSO1,PSO2
3.	CO3: Develop teamwork and apply prior acquired knowledge in problem solving.	PO1,PO2, PO3,PO9,PSO1
4.	CO4: Demonstrate effective verbal and written communication skills.	PO10
5.	CO5: Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards.	PO6,PO8
6.	CO6: Identify the career preferences and professional goals.	PO12,PSO1

PO and PSO mapping with level of strength for Course Name Summer Internship-I

CO/PO Mapping

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

Cos	Programme Outcomes(POs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	2	-	2	-	-	-	-	-	-	-	2	2	-
CO3	2	2	3	-	-	-	-	-	3	-	-	-	1	-	-
CO4	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CO5	-	-	-	-	-	2	-	3	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-
Avg PO attained	1	0.84	0.84	0	0.34	0.34	0	0.5	0.5	0.5	0	0.34	0.64	0.34	0

2.1 Template A1: Syllabus for Theory Courses

School:		**School of Engineering and technology**	
Department		**Department of Computer Science and Engineering**	
Program:		**B.Tech**	
Branch:			
1	Course Code	CSE253	
2	Course Title	Object Oriented Programming Using Java	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Status	Core /Elective/Open Elective	
5	Course Objective	To learn Java language syntax and semantics and concepts such as classes, objects, inheritance, polymorphism and multithreading.	
6	Course Outcomes	CO1. Define Object oriented programming concepts by identifying classes, objects, members of a class and relationships among them needed for a specific problem. CO2: Illustrate different features of java. CO3: Develop Java programs to solve problems of applications using OOP principles such as abstraction, polymorphism and inheritance. CO4: Categorize runtime errors thrown in the application software or generated runtime by applying the methods of exception handling. CO5. Explain the concept of multithreading. CO6. Design real life application using Java	
7	Course Description	Basic Object Oriented Programming (OOP) concepts including objects, classes, methods, parameter passing, information hiding, inheritance and polymorphism are discussed.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to Object Oriented Paradigm**	
	A	Introduction to OOP, Characteristics of OOP, Difference between OOP and procedural languages	CO1, CO2
	B	Byte Code, Architecture of JVM	CO1, CO2
	C	Features of Java, Class Loader Execution Engine, Garbage collection.	CO1, CO2
	Unit 2	**Introduction to Java**	
	A	Classes, Objects ,Constructors, Methods	CO1,CO2
	B	Constants, Variables, Data Types, Operators, Expressions, Decision Making Branching, Loops	CO1, CO2
	C	Arrays	CO1, CO2
	Unit 3	**Polymorphism & String handling**	
	A	Polymorphism, method overloading	CO3
	B	Constructors overloading , Wrapper class ,Type conversion & casting,	CO3
	C	Strings and String handling,	CO3
	Unit 4	**Inheritance**	
	A	Inheritance, Types of inheritance, Overriding methods, use of this and super	CO3,CO6
	B	Constructor call in inheritance, Abstract class , Concept	CO3,CO6

		of multiple inheritance in Java			
	C	Final class, method and variable, Interface, Access Modifiers			CO3,CO6
	Unit 5	**Exception and Multithreading**			
	A	Introduction to Exception Handling, Introduction to try, catch, Finally , throw and throws			CO4,CO6
	B	Checked and Unchecked exceptions, User define exception			CO4,CO6
	C	Introduction to Multithreading, Creating thread using Runnable interface and Thread class, Thread life cycle			CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1.Schildt H, "The Complete Reference JAVA2", TMH			
	Other References	2. Balagurusamy E, "Programming in JAVA", TMH 3. Professional Java Programming: BrettSpell, WROX Publication			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	Define Object oriented programming concepts by identifying classes, objects, members of a class and relationships among them needed for a specific problem.	PO5,PO12
2.	Illustrate different features of java.	PO5
3.	Develop Java programs to solve problems of applications using OOP principles such as abstraction, polymorphism and inheritance.	PO1,PO2,PO3,PO5,PO9, PO12,PSO1,PSO2
4.	Categorize runtime errors thrown in the application software or generated runtime by applying the methods of exception handling and File I/O	PO5
5.	Explain the concept of multithreading.	PO5
6.	Design real life application using Java.	PO1,PO2,PO3,PO5,PO6, PO7,PO9,PO11,PO12,PSO1,PSO2,PSO3

PO and PSO mapping with level of strength for Course Name Object Oriented Programming Using Java **(Course Code CSE243)**

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3
CSE253_ Object Oriented Programming Using Java	CO1					2							2			
	CO2					2										
	CO3	2	3	3		2				3			2	2	3	
	CO4					2										
	CO5					2										
	CO6	3	3	3		2	3	2		3		2	3	3	3	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE 253	Object Oriented Programming Using Java	2.5	3	3	0	2	3	2	0	3	0	2	2.3	2.5	3	2

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

Syllabus: CSE 244, Principles of Operating System

School: SET		**Batch : 2018-2022**	
Program: B.Tech		**Current Academic Year: 2018-19**	
Branch: CSE		**Semester: IV**	
1	Course Code	**CSE 244**	Course Name: Principles of Operating System
2	Course Title	Principles of Operating System	
3	Credits	4	
4	Contact Hours (L-T-P)	3-0-2	
	Course Status	Core	
5	Course Objective	1. This course introduces the challenges for designing the operating systems. 2. Includes different design principles and algorithms. 3. Evaluation of algorithms proposed. 4. Implementation of algorithms and utilities.	
6	Course Outcomes	Students will be able : **CO1:** To Understand the basic concept of Operating system. **CO2:**Explore process management concepts including scheduling, synchronization, deadlocks **CO3:** To understand and implement algorithms in resource allocation and utilization. **CO4:** To integrate and interpret effectiveness, efficiency of algorithms used for resource management of operating systems. **CO5:** Analyze various memory management and virtual memory techniques **CO6:** To Understand file and disk management and analyzing them	
7	Course Description	This course introduces the design principles of operating systems, resource management, identifying challenges and applying respective algorithms.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	
	A	Operating System Concepts and functions, Comparison of different Operating system	CO1
	B	Types of Operating Systems (Batch, Multiprogramming ,Multi Tasking , Multiprocessing, Distributed and Real Time Operating System)	CO1
	C	Operating System Structure(Monolithic, Layered and Microkernel), Operating System Services	CO1
	Unit 2	**Process Synchronization**	
	A	Process Concepts (PCB, Process States , Process Operations, Inter process communication)	CO1, CO2
	B	Critical Section problem & their solutions, Introduction to Semaphores	CO1, CO2
	C	Classical Problems of Synchronization(Producer Consumer Problem, Readers Writer Problem, Dining philosophers problem)	CO1, CO2

	Unit 3	**CPU Scheduling**			
	A	Concept , Types of schedulers(Short term, Long term, Middle term), Dispatcher, Performance Criteria			CO1,CO2
	B	CPU Scheduling Algorithms(FCFS, SJF, Priority, Round Robin, Multilevel Queue, Multilevel feedback Queue)			CO1,CO2,CO3,CO4
	C	Deadlock concepts & Handling Techniques(Avoidance, Prevention and Detection & Recovery)			CO1,CO2,CO3,CO4
	Unit 4	**Memory Management**			
	A	Memory Hierarchy, Memory Management Unit			CO1,CO2,CO3,CO5
	B	Paging, Segmentation			CO1,CO2,CO3,CO5
	C	Virtual memory concept, demand paging, Page replacement algorithms(FCFS, Optimal, LRU)			CO1,CO2,CO3,CO5
	Unit 5	**INPUT-OUTPUT Management**			
	A	Input –Output interface, Modes of data transfer(Programmed, interrupt and DMA)			CO1,CO2,CO3,CO6
	B	Disk structure , Disk scheduling(FCFS,SSTF, SCAN, LOOK,C-SCAN, C-LOOK)			CO1,CO2,CO3,CO4,CO6
	C	File Concept ,File operations, File Directories, Case study of Windows Operating System			CO1,CO2,CO3,CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	2. Silberschatz G, *Operating System Concepts*, Wiley			
	Other References	1. W. Stalling, "Operating System", Maxwell Macmillan 2. Tannenbaum A S, *Operating System Design and Implementation*, Prentice Hall India 3. Milenkovic M, *Operating System Concepts*, McGraw Hill			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**CO1:** To identify the challenges and apply suitable algorithms for them.	PO1,PO2,PO3,PO4,PSO1
2.	**CO2:** To assess the strengths and weaknesses of the algorithms.	PO1, PO3, PO4, PSO2
3.	**CO3:** To understand and implement algorithms in resource allocation and utilization.	PO1,PO2,PO3,PO4
4.	**CO4:** To integrate and interpret effectiveness, efficiency of algorithms used for resource management of operating systems.	PO9, PO10,PO11, PSO3
5.	**CO5:** Analyze various memory management and	PO1,PO2,PO8,PO9,PO10,PSO1

	virtual memory techniques.	
6.	**CO6:** To Understand file and disk management and analyzing them.	PO1,PO2,PO10,PO11,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Principles of Operating System (Course Code CSE 244)

CSE244	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
	CO1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2
	CO2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2
	CO3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1
	CO4	2	2	2	2	1	--	--	2	3	3	3	1	2	2	2
	Co5	2	2	3	-	-	-	-	3	3	1	2	-	3	-	-
	CO6	3	2	-	-	-	-	-	-	-	2	3	-	2	2	-

TERM-IV

School: SET		**Batch :** 2021-2022	
Program:		**Academic Year:** 2021-2022	
Branch: CSE		**Semester:** IV	
1	Course Code	**ARP208**	Course Name : **Quantitative and Qualitative Aptitude Skill Building**
2	Course Title	**Quantitative and Qualitative Aptitude Skill Building**	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
	Course Status	Active	
5	Course Objective	To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 2nd phase of employability enhancement and skill building activity exercise.	
6	Course Outcomes	After completion of this course, students will be able to: CO1: Develop and deliver the effective presentations to interpret the deeper meaning of life. CO2: Improve listening skills so as to understand complex business communication in a variety of global English accents through proper pronunciation CO3: Demonstrate a good understanding of effective business writing and telephone handling Skills CO4: Acquire higher level competency in use of aptitude, logical and analytical reasoning CO5: Develop higher level strategic thinking and diverse mathematical concepts through building number puzzles CO6: Demonstrate higher level quantitative aptitude tools for making business decisions	
7	Course Description	This course bundle allows students to build vision, mission and strategy statements while exposing them to various models of communication along with MTI reduction and the 2nd level of quant, aptitude and reasoning abilities	
8	Outline syllabus – ARP208		CO MAPPING
	Unit 1	**Communicate to Conquer**	

	A	VMOSA (Vision, Mission, Values and Ethics)| Business Communication - Verbal Communication Skills | Barriers in communication | Basics of effective communication – PRIDE & STAR Model	CO1
	B	Different styles of communication & style flexing (Based on the 4 social styles-Analytical, Driving, Expressive, Amiable) | Importance of Listening & practice of Active Listening | The Art of Giving Feedbacks| Feedback Skills | Asking fact finding questions- Probing Skills	CO2
	C	Email Etiquette | Business Writing Skills| Telephone Etiquette Skills (Telephone Handling Skills) | Non Verbal Communication-Kinesthetics, Proxemics, Paralanguage | MTI Reduction Program | Verbal Abilities - 2	CO3
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	
	A	Coding Decoding , Ranking & Their Comparison Level-2	CO4
	B	Series, Blood Relations & Number Puzzle	CO5
	Unit 3	**Quantitative Aptitude**	
	A	Number System Level 2	CO5
	B	Vedic Maths Level-2 | Probability | Permutation & Combination	CO6
	C	Percentage, Profit & Loss ,Partnership, Simple Interest & Compound Interest	CO6
	Weightage Distribution	*(CA)Class Assignment/Free Speech Exercises / JAM – 60% | (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand | **Quantum CAT – Arihant Publications** | **Quicker Maths- M. Tyra** | Power of Positive Action (English, Paperback, Napoleon Hill) | Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon | Goal Setting (English, Paperback, Wilson Dobson*	

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PS O1	PSO 2	PSO 3
ARP208.1	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP208.2	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP208.3	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP208.4	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP208.5	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP208.6	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-

BTY 223 INTRODUCTION TO BIOLOGY FOR ENGINEERS

1	Course number	**BTY 223**	
2	Course Title	**Introduction to Biology for Engineers**	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
5	Course Objective	Students will be introduced to the functions and interactions of biological systems from a quantitative perspective. To provide a foundation in biology with engineering of living systems and to apply various tools of traditional engineering fields. To harness potential of living systems for the benefit of human mankind.	
6	Course Outcomes	After successfully completion of this course students will be able to: 1. To understand the fundamentals of living things, their classification, cell structure and biochemical constituents. 2. To apply the concept of plant, animal and microbial systems and growth in real life situations. 3. To comprehend genetics and the immune system. 4. To know the cause, symptoms, diagnosis and treatment of common diseases. 5. To give a basic knowledge of the applications of biological systems in relevant industries. 6. Understand importance of biological components in everyday life	
7	Outline syllabus:		
7.01	XXXNNN.A	**Unit A**	**UNIT I: INTRODUCTION TO LIFE**
7.02	XXXNNN.A1	Unit A Topic 1	Characteristics of living organisms
7.03	XXXNNN.A2	Unit A Topic 2	Cell theory
7.04	XXXNNN.A3	Unit A Topic 3	Structure of prokaryotic and eukaryotic cell
7.05	XXXNNN.B	**Unit B**	**UNIT II: Biomolecules**
7.06	XXXNNN.B1	Unit B Topic 1	General classification and important functions of carbohydrates and lipids
7.07	XXXNNN.B2	Unit B Topic 2	General classification and important functions of proteins
7.08	XXXNNN.B3	Unit B Topic 3	General classification and important functions of DNA and RNA
7.09	XXXNNN.C	**Unit C**	**UNIT III: Genetics and Immune system**
7.10	XXXNNN.C1	Unit C Topic 1	Theories of Evolution
7.11	XXXNNN.C2	Unit C Topic 2	Mendel's laws of inheritance
7.12	XXXNNN.C3	Unit C Topic 3	Immune system and Immunity
7.13	XXXNNN.D	**Unit D**	**UNIT IV: Human Diseases**
7.14	XXXNNN.D1	Unit D Topic 1	Genetic diseases and Infectious diseases
7.15	XXXNNN.D2	Unit D Topic 2	AIDS and Diabetes
7.16	XXXNNN.D3	Unit D Topic 3	Cancer and its causes
7.17	XXXNNN.E	**Unit E**	**UNIT V: Biology and its industrial application**
7.18	XXXNNN.E1	Unit E Topic 1	Vaccines and their types
7.19	XXXNNN.E2	Unit E Topic 2	Bioremediation and biofertilizers
7.20	XXXNNN.E3	Unit E Topic 3	Bioreactors
8	Course Evaluation		
8.1	Course work: 30% marks		
8.11	Attendance	None	
8.12	Assignments	5 marks	
8.13	Quizzes	20 marks	
8.14	Presentations	5 marks	
8.15	Any other	None	
8.16	MTE	20 marks	
8.18	End-term examination: 50 marks		

8.19	References	
8.20	Text book	1. Karp, G. *Cell and Molecular Biology*, *5th ed.*, John Wiley and Sons, Inc.
8.21	Other References	1. Alberts, B. et al. *Essential Cell Biology*, Garland Publishing, Inc. (ISBN: 081533480X) 4. 2. Berger, S. et al. *Introduction to Bioengineering*, Oxford University Press (ISBN: 978-0-19-856515-4)

Mapping of Outcomes vs. Topics

CSE mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-	-	1	3	-	-	-	-	3	-	-	-
CO2	3	2	-	-	-	2	-	-	-	-	-	3	-	-	-
CO3	3	3	3	1	1	3	3	2	1	3	-	3	1	1	-
CO4	3	2	-	-	-	2	2	3	1	2	-	3	1	-	-
CO5	3	1	1	1	3	1	3	2	1	2	1	3	1	1	-
CO6	3	3	1	1	2	3	5	1	1	1	-	3	1	-	-

Syllabus: CSE 011, Mathematical Techniques (Program Elective-1)

School: SET		**Batch: 2019-2023**	
Department		**Department of Computer Science and Engineering**	
Program: B.Tech		**Current Academic Year: 2019-2020**	
Branch:CSE		**Semester:V**	
1	Course Code	CSE 011	
2	Course Title	Mathematical Techniques	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Program Elective-I	
5	Course Objective	The objective of the course is to teach students the mathematical & statistical techniques that provide sound basis for research and application development in Computer Science.	
6	Course Outcomes	By the end of the course, students will be able to: CO1: Identify and analyze computational errors in numerical computation and series approximation. CO2: Make use of various Numerical techniques for interpolation. CO3: Recall probability concepts and statistical terms to apply in various random situations CO4: Identify various distributions for suitable scenario CO5: Make use of various techniques for hypothesis testing CO6: Apply mathematical and statistical methods in their research and application development	
7	Course Description	In this subject, the fundamental concepts and principles of Mathematical & Statistical Techniques together with the challenging issues in Computer Science software development will be introduced. Discussion on various topics related to mathematics and Computer Science will also be conducted.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction, Computational Errors and their Analysis**	
	A	Accuracy of numbers, Errors and a general error formula, Errors in Numerical Computations.	CO1, CO6
	B	Errors in a Series Approximation.	CO1, CO6
	C	Precisions	CO1, CO6
	Unit 2	**Numerical Techniques**	
	A	LU decomposition for systems of linear equations;	CO2, CO6
	B	numerical solutions of non-linear algebraic equations by Secant, Bisection and Newton-Raphson Methods;	CO2, CO6
	C	Numerical integration by trapezoidal and Simpson's rules.	CO2, CO6
	Unit 3	**Probability**	
	A	Probability: Conditional Probability;	CO3,CO6
	B	Mean, Median, Mode and Standard Deviation;.	CO3,CO6
	C	Random Variables; Distributions;	CO3,CO6
	Unit 4	**Permutation**	
	A	uniform, normal, exponential	CO4,CO6
	B	Poisson, Binomial distribution	CO4,CO6
	C	Permutations; Combinations; Counting; Summation;	CO4,CO6
	Unit 5	**Hypothesis testing**	
	A	Generating functions; recurrence relations;	CO5,CO6

	B	Techniques for statistical quality control,			CO5,CO6
	C	Testing of hypothesis.			CO5,CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	M. Goyal, "Computer Based Numerical & Statistical Techniques", Infinity Science Press, LLC, MA, USA.			
	Other References	1. Matheus Grasselli and Dimitry Pelinovsky, "Numerical Mathematics", Jones and Bartlet Publishers, USA. 2. Lars Elden, "Mattrix Methods in Data Mining and Pattern Recognition", SIAM (Society for Industrial and Applied Mathematics), USA. 3. Internet as a resource for references.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Identify and analyze computational errors in numerical computation and series approximation.	PO1, PO2, PSO1
2.	CO2: Make use of various Numerical techniques for interpolation.	PO1, PO2, PO3, PO7, PO10, PO11, PO12, PSO1, PSO2
3.	CO3: Recall probability concepts and statistical terms to apply in various random situations	PO1, PO2, PO3, PO4, PO7, PO10, PO11, PO12, PSO1,PSO2
4.	CO4: Identify various distributions for suitable scenario	PO1, PO2, PO3, PO4, PO5, PO7, PO10, PO11, PO12, PSO1, PSO2
5.	CO5: Make use of various techniques for hypothesis testing	PO1, PO2, PO3, PO4, PO5, PO7, PO10, PO11, PO12, PSO1, PSO2
6.	CO6: Apply mathematical and statistical methods in their research and application development	PO1, PO2, PO3, PO4, PO5, PO7, PO10, PO11, PO12, PSO1, PSO2

PO and PSO mapping with level of strength for Course Name Mathematical techniques (Course Code CSE011)

Course	Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3
Mathematical techniques (CSE011)	CO1	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
	CO2	2	3	1	1	1	-	1	-	-	1	2	1	1	1	-
	CO3	3	1	1	1	-	-	1	-	-	2	1	1	3	1	-
	CO4	2	3	2	1	1	-	1	-	-	1	1	1	2	1	-
	CO5	1	1	1	2	2	-	1	-	-	1	2	1	2	1	-
	CO6	3	1	3	1	2	-	2	-	-	2	2	3	3	1	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE011	Mathematical techniques	2.3	1.8	1.3	1	1	0	1	0	0	1.1	1.3	1.1	2.1	.8	0

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

School: SET		**Batch :2018**	
Program: B.Tech		**Current Academic Year: 2018-19**	
Branch:CS/IT		**Semester:5**	
1	Course Code	CSE012	Course Name: Introduction to Graph Theory and its Application
2	Course Title	Introduction to Graph Theory and its Application	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Program Elective-I	
5	Course Objective	The objective of the course is to teach students the basic graph theory concepts and their applications in computer science.	
6	Course Outcomes	After successful completion of the course students will be able to CO1: demonstrate some of the most important notions and types of graph theory and develop their skill in solving basic applications understanding societal needs. CO2: interpret the fundamentals of graphs and trees and to apply these as computer science applications such as to find a minimal spanning tree for a given weighted graph etc. CO3: Discover the advanced properties and concepts of graphs such as cut-sets and circuits in graph, planarity of graphs etc in addition to their application in real-world. CO4: Examine a graph using matrices to communicate their application in real world. CO5: Develop efficient graph-theoretic algorithms (mathematically) to explore the applications of coloring problem of graph theory. **CO6: Relating the concepts to prepare grounds for project work and research interests.**	
7	Course Description	This course is to teach students the basic graph theory concepts and their applications in computer science.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	
	A	Basic terminologies and concepts of Graph Theory, Fundamental types of graphs, Applications in various areas	CO1
	B	Properties of graphs, theorems based on different types of graph and various operations on graphs	CO1,CO2
	C	Special types of graphs (Hamiltonian, Euler), Travelling salesman problem	CO1, CO6
	Unit 2	**TREES**	
	A	Fundamentals of trees and their types, Binary trees and their properties, importance of binary trees in data structure (searching algorithms)	CO2
	B	fundamental circuits, spanning trees, algorithms to find spanning trees in a weighted graph (Kruskal& Prim)	CO2
	C	Applications: Representation of the algebraic expressions as ordered binary trees, Huffman procedure for construction of an optimal tree for a given set of weights.	CO2, CO6
	Unit 3	**CUT SETS**	

	A	a cut-set of a connected graph, the fundamental circuit ,Properties of circuits & cut–sets, Concept of connectivity and separability			CO1, CO3
	B	Concept of Planar graphs with introduction to Kuratowski's non-planar graphs, Proof of Euler's formula			CO3
	C	Detection of planarity , geometric duals of graph, thickness & Crossings, network flow			CO3, CO6
	Unit 4	**Coloring and Covering**			
	A	Concept of proper coloring of vertices of a graph, chromatic number , Chromatic partitioning			CO5, CO6
	B	Chromatic polynomial, finding chromatic polynomial of a given graph			CO5, CO6
	C	Matching, Covering, Five color problem and its proof			CO5, CO6
	Unit 5	**Matrix Representation of Graphs& Applications**			
	A	Incidence matrix, sub matrices of A(G), circuit matrix, fundamental circuit matrix and Rank of B			CO3, CO4
	B	Cut set matrix , fundamental cut set matrix, path matrix, Adjacency matrix			CO4
	C	Finding Rank of different matrices, Relationship among A_f, B_f, andC_f			CO3, CO4
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	Deo, N, *Graphtheory with applications to Engineering and Computer Science*, Prentice Hall India			
	Other References	1. Wilson R J, *Introduction to Graph Theory*, PearsonEducation 2. Harary, F, *Graph Theory*, Narosa 3. Bondy& Murthy, *Graph theory and application*. Addison Wesley			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: : demonstrate some of the most important notions and types of graph theory and develop their skill in solving basic applications understanding societal needs.	PO1, PO2, PO6, PO7, PO10, PO11, PO12, PSO1
2.	CO2: interpret the fundamentals of graphs and trees and to apply these as computer science applications such as to find a minimal spanning tree for a given weighted graph etc.	PO1, PO2, PO3, PO4, PO6, PO7, PO10, PO12, PSO1
3.	CO3: Discover the advanced properties and concepts of graphs such as cut-sets and circuits in graph, planarity of graphs etc in addition to their application in real-world.	PO2, PO4, PO5,PO6, PO10, PO12, PSO2
4.	CO4: Examine a graph using matrices to communicate their application in real world.	PO2, PO4, PO10,PSO1, PSO2,
5.	CO5: Develop efficient graph-theoretic algorithms (mathematically) to explore the applications of coloring problem of graph theory.	PO1, PO2, PO4, PO5, PO6, PO10, PO12, PSO2
6	**CO6: Relating the concepts to prepare grounds for project work and research interests.**	PO4, PO6,PO12,PO10, PSO2, PSO3.

PO and PSO mapping with level of strength for Course Name: Introduction to Graph Theory and its Application (CSE 012)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	2	2	-	-	2	1	2	3	1	-
CO2	3	3	3	2	-	1	1	-	-	1	-	2	3	1	-
CO3	1	3	1	3	2	2	-	-	-	1	-	2	2	2	-
CO4	1	3	1	3	1	1	-	-	-	2	-	1	3	2	-
CO5	2	2	2	3	2	1	-	-	-	1	-	2	1	2	-
Co6	1	1	2	3	1	2	-	-	-	2	-	2	1	2	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE012	Introduction to Graph Theory and its Application	1.83	2.83	1.83	2.67	1.17	1.5	0.5	-	-	1.5	0.17	1.83	2.17	1.67	0.33

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

Syllabus: CSE 249, Database management System

School: SET		**Batch: 2019-2023**	
Program: B.Tech		**Current Academic Year: 2019-2020**	
Branch: CSE		**Semester: IV**	
1	Course Code	CSE249	Course Name
2	Course Title	**Database Management System**	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status		
5	Course Objective	1.Develop the ability to design, 2. Implement and manipulate databases. 3. Introduce students to build data base management systems. 4. Apply DBMS concepts to various examples and real life applications.	
6	Course Outcomes	Students will be able to: **CO1:** Explain the basics concepts of data base. **CO2:** Demonstrate the knowledge of databases to E-R modelling. **CO3:** Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respective data. **CO4:** Apply normalization techniques to reduce redundancy from the database. **CO5:** To appraise the basic issues of Transaction processing, Serializability& concurrency control **CO6:** Design & develop database for real life problems	
7	Course Description	This course introduces database design and creation using a DBMS product. Emphasis is on, normalization, data integrity, data modeling, and creation of simple tables, queries, reports, and forms. Upon completion, students should be able to design and implement normalized database structures by creating simple database tables, queries, reports, and forms.	
8	Outline syllabus		CO Mapping

	Unit 1	**Introduction to Databases:**	
	A	Introduction ofof DBMS, Characteristic of DBMS, Data Models, Database languages, Database Administrator, Database Users.	CO1,CO2,CO6
	B	Three Schema architecture of DBMS, Data Models,Hierarchical, Network ,Data independence and database language, DDL, DML, Data Modeling using Entity Relationship Model	
	C	Strong Entity, Weak entity, Specialization and generalization, converting ER Model to relational tables.	
	Unit 2	**Relational Database Language and Interfaces:**	
	A	Relational data model concepts ,Concept of keys, Mapping Constraints	CO3
	B	Null Values, Domain Constraints, Referential Integrity Constraints	
	C	Unary Relational Operations: SELECT and PROJECT Relational Algebra Operations from Set Theory ,Binary Relational Operations: JOIN and DIVISION ,SQL.	
	Unit 3	**Normalization in Design of Databases:**	
	A	Functional Dependency, Different anomalies in designing a Database, loss less join decompositions	CO1, CO4, CO6
	B	Normalization : first second and third normal forms, BoyceCodd normal form, dependency preservation,	
	C	multi-valued dependencies , fourth normal forms, Inclusion dependencies,	
	Unit 4	**Transaction Management:**	
	A	Transaction processing system, schedule and recoverability, Testing of serializability,	CO5
	B	Serializability of schedules, conflict & view serializable schedule	
	C	Recovery from transaction failures, deadlock handling.	
	Unit 5	**Concurrency Control**	
	A	Two-Phase Locking Techniques for Concurrency Control , Concurrency Control Based on Timestamp Ordering	CO5
	B	Multiversion Concurrency Control Techniques ,Validation (Optimistic) Concurrency Control Techniques	

	C	Granularity of Data Items and Multiple Granularity Locking			
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Korth , Silberschatz&Sudarshan, Data base Concepts, Tata McGraw-Hill, Latest Edition			
	Other References	1.Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education Inc. 2.Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to design, Implementation and Management, Pearson Education, Third Edition.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	Understand the basics concepts of data base.	PO1, PO6, PO12, PSO1,PSO2
2.	Acquire the knowledge of databases to E-R modelling.	PO1 , PO5 , PO6 ,PO9, PO12, PSO1 PSO2
3.	Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respective data.	PO1, PO2, PO3, PO5, PO6, PO12 PSO1, PSO2
4	Learn the basic concept of normalization & apply them to reduce redundancy from the database .	PO1, PO2, PO3, PO4, PO6 ,PO8 PO9 ,PO12 , PSO3
5	To appraise the basic issues of Transaction processing ,Serializability& concurrency control	PO1, PO2, PO3, PO5, PO6, PO8 PO12 ,PSO2
6	Design & develop database for real life problems	PO1, PO2, PO3, PO4, PO5, PO6 PO8 ,PO9 ,PO10 ,PO11, PO12 PSO3

PO and PSO mapping with level of strength for Course Name Database Management System(Course Code CSE 249)

COs	PO1 Engineering knowledge	PO2 Problem analysis	PO3 Design/development of solutions	PO4 Conduct investigations of complex problems	PO5 Modern tool usage	PO6 The engineer and society	PO7 Environment and sustainability	PO8 Ethics	PO9 Individual and team work	PO10 Communication:	PO11 Project management and finance	PO12 Life-long learning	PSO1 Familiarity and practical proficiency	PSO2 Understand, analyse and develop	PSO3 Apply standard Software
CO1	3	-	-	-	-	2	-	-	-	-	-	3	3	3	-
CO2	2	-	-	-	3	2	-	-	2	-	-	3	3	3	-
CO3	3	3	3	-	3	2	-	-	-	-	-	2	2	3	-
CO4	3	3	3	3	-	2	-	2	3	-	-	2	-	-	3
CO5	2	3	2	-	2	2	-	2	-	-	-	1	-	3	-
CO6	3	3	3	3	3	3	-	3	3	3	2	3	-	-	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code/ Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE 249/ DBMS	2.67	3	2.75	3	2.75	2.2	-	2.3	2.7	3	2	2.3	2.6	3	3

Strength of Correlation:1. Addressed to ***Slight (Low=1) extent 2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

INP248:Human Computer Interaction Lab

School:		**School of Engineering and technology**	
Department		**Department of Computer Science and Engineering**	
Program:		**B.Tech**	
Branch:			
1	Course Code	INP248	
2	Course Title	Human computer interaction lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory/Elective	
5	Course Objective	This course teaches students to design user interfaces based on the capabilities of computer technology and the needs of human factors.	
6	Course Outcomes	CO1: Define the concept of software for user interface CO2: Build the user interface keeping design considerations in mind. CO3: Construct user interface for student registration and displaying picture. CO4: Design user interface for calculator and menu based applications CO5: Build the user interface for any reservation system CO6: Develop, implement and evaluate effective and usable graphical computer interfaces.	
7	Course Description	Course readings will span practice in interface specification, design and evaluation. This course gives experience as working in interdisciplinary design teams. Students will learn principles and guidelines for usability, quantitative and qualitative analysis methods, and apply them through critiques of existing interfaces and development of new ones.	
8	Outline syllabus		CO Mapping
	Unit 1		
		1) Introduction to tool and design an interface for welcome screen	CO1,CO6
		2) Design an interface for multiplication and addition of any two numbers	CO1,CO6
	Unit 2		
		3)Design an user interface for assigning a grade to students based on the subjects marks	CO2,CO6
		4)Design an user interface for printing the numbers in a) Ascending order b) descending order	CO2,CO6
	Unit 3		
		5)Design an user interface for registration of students for admission	CO3,CO6
		6)Design an user interface for displaying and changing of picture on the form	CO3,CO6
	Unit 4		
		7)Design an user interface for menu based program	CO4,CO6
		8)Design an user interface for mathematical and	CO4,CO6

		scientific calculator			
	Unit 5				
		9)Design an user interface for reservation system e.g. bus/Flight/railways etc.			CO5,CO6
		10)Design and implement modules of a given application or system.			CO5,CO6
	Mode of examination	Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	-			
	Other References	Internet as a resource			

PO and PSO mapping with level of strength for Course Name INP248 (Course Code Human Computer Interaction Lab)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
INP248_Human computer Interaction Lab	CO1	2	1	1	1	3	1	-	-	1	3	3	3	2	2	1
	CO2	2	1	2	2	3	1	-	-	1	3	3	3	2	2	1
	CO3	2	1	2	2	3	1	-	-	1	3	3	3	2	2	1
	CO4	2	1	2	2	3	1	-	-	1	3	3	3	2	2	1
	CO5	2	2	2	2	3	1	-	-	2	3	3	3	2	2	1
	CO6	3	2	3	3	3	2	-	-	3	3	3	3	2	2	1

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
INP 248	Human computer interaction Lab	2	1.3	2	2	3	1.6	-	-	1.5	3	3	3	2	2	1

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

INT248: Human Computer interaction

School:	**School of Engineering and technology**
Department	**Department of Computer Science and Engineering**
Program:	**B.Tech**
Branch:	

1	Course Code	INT248	
2	Course Title	Human Computer Interaction	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core /Elective/Open Elective	
5	Course Objective	The main objective is to make student think constructively and analytically about how to design and evaluate interactive technologies.	
6	Course Outcomes	CO1: Define the capabilities of both humans and computers from the viewpoint of HCI. CO2: Explain different types of User interfaces. CO3: Describe and use HCI design principles, standards and guidelines. CO4: Understand the fundamental aspects of designing and evaluating interfaces. CO5: Analyse and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems. CO6: Adapt methodologies to design, implement and evaluate a user interface for a project	
7	Course Description	HCI is an interdisciplinary field that integrates theories and methodologies from computer science, cognitive psychology, design, and many other areas. This course is an introduction to the fundamentals of human-computer interaction, user interface design, and usability analysis. Students will learn principles and guidelines for usability and apply them through critiques of existing interfaces and development of new ones.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	
	A	Introduction to HCI, CHI, MMI, Human System Interaction, Importance of User Interface, Importance of Good Design, Benefits of Good Design, Principles of User Interface Design	CO1
	B	Techniques and Tasks, Basic Interaction Tasks, Composite Interaction Task, Interaction Styles, Speech Recognition, Natural Language Processing, Fields of HCI	CO1
	C	The Contents of Human-Computer Interaction, Nature of Human-Computer Interaction, Applications , Goals and Aspects , HCI Groups	CO1
,	**Unit 2**	**Interfaces**	
	A	Term Interface, Good and Bad Interfaces, Features of a Good Interface,	CO2,CO6
	B	User interface, Quality of User Interface, Types of User Interfaces, Command Line Interface, Advantages of Command Line Interface, Graphical User Interface	CO2,CO6
	C	Document Interfaces and their types, Single Document Interface (SDI), Multiple Document Interface (MDI), Tabbed Document Interface.	CO2,CO6
	Unit 3	**User Interface Design & GUI**	
	A	Understanding How User Interact With Computers, User	CO3,CO6

		Interface Models, Design Methodologies, Designing an Interface, Process of Interaction Design.	
	B	Human Interaction with Computers, Human Interaction Speeds, Human Characteristics in Design, Human Consideration in Design, Eight golden rules user interface design	CO3,CO6
	C	Popularity of Graphics, Characteristics of Graphical User Interface, Concepts of Direct Manipulation, Graphical System Advantages and Disadvantages, Web User Interface Characteristics and Popularity	CO3,CO6
	Unit 4	**Design Models and Ergonomics**	
	A	User interface models, User interface design methodologies, Efficacy of user interface design, Dialogue box design, Development and evaluation of user interface design, user centered design.	CO4,CO6
	B	Factors in user interface design, HCI design models, Process of interface analysis,	CO4,CO6
	C	User documentation, Ergonomics introduction, Human factors, Physical issues in ergonomics, cognitive issues in ergonomic	CO4,CO6
	Unit 5	**Usability**	
	A	Usability introduction & its need, usability acceptability,	CO5,CO6
	B	What to measure in Usability, Usability Engineering,	CO5,CO6
	C	Life cycle, how to achieve high usability, Usability evaluation and testing, Learnability, Flexibility.	CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	Alan Dix, Janet Finlay, Gregory Abowd. Ruel Beale "Human Computer Interaction",PHI.	
	Other References	1. Kumar Rajendra, " Human Computer Interaction" Second Edition, Firewall Media New Delhi. 2. Ben Shneiderman, "Design the User Interface: Strategies for Effective Human-Computer Interaction" Pearson Education.	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Define the capabilities of both humans and computers from the	PO1,PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO12,PSO1

	viewpoint of HCI.	
2.	CO2: Explain different types of User interfaces.	PO1,PO2,PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO12,PSO1
3.	CO3: Describe and use HCI design principles, standards and guidelines.	PO1,PO2,PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO12,PSO1
4.	CO4: Understand the fundamental aspects of designing and evaluating interfaces.	PO1,PO2,PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO12,PSO1
5.	CO5: Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO11,PO12,PSO1
6.	CO6: Adapt methodologies to design, implement and evaluate a user interface for a project	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO11,PO12,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Human Computer Interaction(Course Code INT 248)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
INT248_Human Computer Interaction	CO1	1	-	-	1	1	1	2	1	2	3	-	3	1	-	-
	CO2	1	1	-	1	1	1	2	2	2	3	-	3	1	-	-
	CO3	1	1	-	1	1	1	2	2	2	3	-	3	2	-	-
	CO4	1	2	-	1	1	1	2	2	2	3	-	3	1	-	-
	CO5	3	3	3	3	2	1	2	2	2	3	3	3	1	-	-
	CO6	2	3	3	3	2	2	3	2	2	3	3	3	3	2	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
INT248	Human Computer Interaction	1.5			1.6	1.3	1.1	2.1	1.8	2	3	3	3	1.5	2	-

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

Syllabus: CSE 252, Computer Networks

School: SET		**Batch: 2019 onwards**	
Program: B.Tech		**Current Academic Year: 2020-2021**	
Branch:CSE		**Semester: 4**	
1	Course Code	CSE252 | Course Name: B. Tech	
2	Course Title	**Computer Networks**	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Compulsory	
5	Course Objective	Provide students with an overview of networking, insight into the issues, challenges and working at all level of reference models. Also practice on applying protocols in network design.	
6	Course Outcomes	Students will be able to: **CO1:**Demonstrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model. **CO2:**Investigate and explore fundamental issues driving network design including error control. **CO3:** Understand and building the skills of IP addressing, subnetting and routing protocols. **CO4:** Discuss the flow control, elements and protocols of transport layer **CO5:** Describe the connection management and application layer protocols. **CO6:** Outline the basic knowledge of the use of cryptography and network security.	
7	Course Description	To familiarize with the basic taxonomy and terminology of computer networking area.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	
	A	Introduction to computer networks, applications and uses, classification of Networks based on topologies, geographical distribution and communication techniques	CO1, CO2
	B	**Reference models:** OSI model, TCP/IP model , Overview of Connecting devices (Hub, Repeaters, Switches, Bridges, Routers, Gateways)	CO1, CO2
	C	**Transmission Media:**wired , wireless, Multiplexing techniques-FDM, TDM	CO1, CO2
	Unit 2	**Data Link Layer**	
	A	Functions, Framing, Error Control-Error correction codes(Hamming code),Error Detection codes(Parity Bit, CRC)	CO1, CO2
	B	Flow Control- Stop and Wait Protocol, Sliding window –Goback N and Selective repeat(ARQ)	CO1, CO2
	C	MAC- Sub-layer Protocols: ALOHA, CSMA, CSMA/CD protocols, IEEE Standards 802.3, 802.4,802.5	CO1, CO2
	Unit 3	**Network Layer**	
	A	Design issues , IPV4addressing basics and Header format, CIDR, sub-netting and sub-masking	CO1,CO3
	B	Routing, optimality Principle Routing protocols-, Shortest path,	CO1,CO3

		flooding, distance vector routing , link state routing	
	C	Congestion control-Leaky bucket , Token Bucket, jitter control	CO1,CO3,CO4
	Unit 4	**Transport Layer**	
	A	Need of transport layer with its services, Quality of service, connection oriented and connection less	CO1,CO4
	B	Transmission Control Protocol: Segment structure and header format, TCP Connection Management, Flow Control	CO1,CO4,CO5
	C	TCP congestion control, Internet Congestion Control Algorithm, Overview of User Datagram Protocol (UDP)	CO1,CO4,CO5
	Unit 5	**Application Layer**	
	A	Domain Name System (DNS), HTTP, FTP, SMTP	CO1,CO5
	B	Network Security services, cryptography, Symmetric versus Asymmetric cryptographic algorithms- DES, and RSA	CO1,CO5,CO6
	C	Application of Security in Networks: Digital signature	CO1,CO5,CO6
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	1. Tanenbaum, A.S." Computer Networks", 4th Edition, PHI	
	Other References	1. Forouzan, B.., "Communication Networks", TMH, Latest Edition 2. W. Stallings, "Data and Computer Communication" Macmillan Press	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**CO1:**Demonstrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model.	PO2,PO11,PO12,PSO2
2.	**CO2:**Investigate and explore fundamental issues driving network design including error control.	PO1,PO3,PO4,PO5,PO11PO12,PSO2
3.	**CO3:** Understand and building the skills of IP addressing, subnetting and routing protocols.	PO1,PO2,PO4,PO6,PSO1,PSO3
4.	**CO4:** Discuss the flow control, elements and protocols of transport layer	PO2,PO3,PSO2,PSO3
5.	**CO5:** Describe the connection management and application layer protocols.	PO1, PO2,PO3, PO4, PSO2
6.	**CO6:** Outline the basic knowledge of the use of cryptography and network security.	PO1, PO2, PO4,PO8 PO11, PSO2

PO and PSO mapping with level of strength for Course Name Computer Networks (Course Code CSE 252)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication:	Project management and finance	Life-long learning	Familiarity and practical proficiency	Understand, analyse and develop	Apply standard Software
CO1		2	-	-	-	-	-	-	-	-	2	3	-	3	-
CO2	2	-	2	2	3	-	-	-	-	-	2	3		3	-
CO3	3	2	-	2	-	2	-	-	-	-	-	-	2	-	2
CO4	-	2	2	-	-	-	-	-	-	-	-	-	-	2	2
CO5	2	2	2	2	-	-	-	-	-	-	-	-	-	2	-
CO6	2	-	-	2	-	-	-	2	-	-	2	-	-	2	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code/ Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
Computer Networks	1.5	1.33	1	1.33	0.5	0.33	-	0.33	-	-	1	1	0.33	2	0.67

Strength of Correlation:1. Addressed to ***Slight (Low=1) extent 2.*** Addressed to ***Moderate (Medium=2) extent 3.*** Addressed to ***Substantial (High=3) extent***

Syllabus: CSP 249, Database management System Lab

School: SET		**Batch: 2019-2023**	
Program: B.Tech		**Current Academic Year: 2019-2020**	
Branch:CSE		**Semester: IV**	
1	Course Code	CSP249	
2	Course Title	Database Management System Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	• To Develop efficient SQL programs to access Oracle databases • Build database using Data Definition Language Statements • Perform operations using Data Manipulation Language statements like Insert, Update and Delete	
6	Course Outcomes	By the end of this course you will be able to: CO1: Understand the concept of SQL commands in DBMS CO2: Create SQL SELECT statements that retrieve any required data CO3: Perform operations using Data Manipulation Language statements like Insert, Update and Delete CO4: Manipulate your data to modify and summaries your results for reporting CO5: Apply Grouping Clauses on various tuples & relations of database CO6: Develop project based on various SQL commands.	
7	Course Description	An introduction to the design and creation of relational databases. Create database-level applications and tuning robust business applications. Lab sessions reinforce the learning objectives and provide participants the opportunity to gain practical hands-on experience.	
8	Outline syllabus		CO Mapping
	Unit 1	**Practical based Data types**	
		Classification SQL, Data types of SQL/Oracle	CO1,CO2
	Unit 2	**Practical based on DDL commands**	
		Create table, Alter table and drop table	CO2,CO3
	Unit 3	**DML commands and Aggregate functions**	
		Introduction about the INSERT, SELECT, UPDATE & DELETE commands.	CO3,CO4
	Unit 4	**Practical based on Grouping Clauses GROUP BY ORDER BY & GROUP BY HAVING**	
		Briefly explain Group by, order by ,having clauses with examples. Aggregate function: sum, avg, count, max, min	CO5
	Unit 5	**Practical based on Sub- queries, JOINS**	
		Related example of Sub- queries, Joins and related examples,Views,Trigger	CO5,CO6
	Mode of examination	Jury/Practical/Viva	

	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	Korth ,Silberschatz& Sudarshan, Data base Concepts, Tata McGraw-Hill			
	Other References	1. Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education Inc. 2. *Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to design, Implementation and Management, Pearson Education, Latest Edition.* 3. *Jeffrey D. Ullman, Jennifer Windon, A first course in Database Systems, Pearson Education.*			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Understand the concept of SQL commands in DBMS.	PO1,PO5, PSO1 ,PSO2
2.	CO2: Create SQL SELECT statements that retrieve any required data.	PO2, PO3, PO4, PO5, PO9,PSO1, ,PSO3
3.	CO3: Perform operations using Data Manipulation Language statements like Insert, Update and Delete.	PO2, PO3, PO4, PO5, PO9,PSO1, ,PSO3
4.	CO4: Manipulate your data to modify and summaries your results for reporting.	PO2, PO3, PO4, PO5, PO9,PSO1, ,PSO3
5	CO5: Apply Grouping Clauses on various tuples & relations of database	PO2, PO3, PO4, PO5, PO9,PSO1, ,PSO3
6	CO6: Develop project based on various SQL commands.	PO2, PO3, PO4, PO5, PO9, PO12,PSO1, PSO2,PSO3

PO and PSO mapping with level of strength for Course Name Principles of Database Management System lab (Course Code CSP 249)

COs	PO1 Engineering knowledge	PO2 Problem analysis	PO3 Design/development of solutions	PO4 Conduct investigations of complex problems	PO5 Modern tool usage	PO6 The engineer and society	PO7 Environment and sustainability	PO8 Ethics	PO9 Individual and team work	PO10 Communication:	PO11 Project management and finance	PO12 Life-long learning	PSO1 Familiarity and practical proficiency	PSO2 Understand, analyse and develop	PSO3 Apply standard Software
CO1	3	-	-	-	2	-	-	-	-	-	-	-	2	3	2
CO2	-	3	3	3	2	-	-	-	3	-	-	-	2	3	3
CO3	-	2	2	2	2	-	-	-	3	-	-	-	2	2	3
CO4	-	2	2	2	2	-	-	-	3	-	-	-	2	2	3
CO5	-	2	2	2	2	-	-	-	3	-	-	-	2	2	3
CO6	-	2	3	2	3	-	-	-	3	-	-	2	3	3	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code/ Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO 3
CSP249 / DBMS lab	3	2.2	2.4	2.2	2.2	-	-	-	3	-	-	2	2.2	2.5	2.8

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

.

School:		School of Engineering and technology	
Department		Department of Computer Science and Engineering	
Program:		B.Tech	
Branch:			
1	Course Code	CSP-252	
2	Course Title	Computer Networks Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory/Elective	
5	Course Objective	The students will be introduced to the basic concepts and fundamentals of computer networks along with the study of individual layers of reference model.	
6	Course Outcomes	Students will be able to: CO1: Explain the basic concepts of computer network. CO2: Illustrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model CO3: Analyze fundamental issues driving network design including error control, IP addressing, access control, flow and congestion control CO4: Compare working of various routing algorithms CO5: Test various network security algorithms CO6: Examine various cryptographic Algorithms	
7	Course Description	To familiarize with the basic taxonomy and terminology of computer networking area.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction	
	A	Study of Data Communication and Networking. Identify five components of Data communication system.	CO1, CO2
	B	Study of computer network topology and OSI model layered architecture.	CO1, CO2
	C	Study of basic networking commands: IPCONFIG, PING / Tracer and Net stat utilities to debug the network issues.	CO1, CO2
	Unit 2	Data Link Layer	
	A	To connect the computers in Local Area Network	CO1, CO2
	B	Write a C program to implement Character Stuffing and Destuffing	CO1, CO2
	C	Write a C program to Error Detection using Cyclic Redundancy Check Algorithms.	CO1, CO2
	Unit 3	Network Layer	
	A	Write a program to generate Hamming code.	CO1,CO3
	B	Write a C program to determine if the IP address is in Class A, B, C, D, or E.	CO1,CO3

	C	Write a C program to translate dotted decimal IP address into 32 bit address.			CO1,CO3,CO4
	Unit 4	Transport Layer			
	A	Write a program for congestion control using Leaky bucket algorithm.			CO1,CO4
	B	Write a Program to simulate Distance vector routing.			CO1,CO4,CO5
	C	Creating a Network topology using CISCO packet tracer software			CO1,CO4,CO5
	Unit 5	Application Layer			
	A	Write a program to implement DES for encryption.			CO1,CO5
	B	Using RSA algorithm encrypts a text data and decrypts the same.			CO1,CO5,CO6
	C	Open Ended Project			CO1,CO5,CO6
	Mode of examination	Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	Tanenbaum, A.S." Computer Networks", 4th Edition, PHI			
	Other References	1. Forouzan, B.., "Communication Networks", TMH, Latest Edition 2. W. Stallings, "Data and Computer Communication" Macmillan Press			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Explain the basic concepts of computer network.	PO2,PO11,PO12,PSO2
2.	CO2: Illustrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model	PO1,PO3,PO4,PO5,PO11PO12,PSO2
3.	CO3: Analyze fundamental issues driving network design including error control, IP addressing, access control, flow and congestion control	PO1,PO2,PO4,PO6,PSO1,PSO3
4.	CO4: Compare working of various routing algorithms	PO2,PO3,PSO2,PSO3
5.	CO5: Test various network security algorithms	PO1, PO2,PO3, PO4, PSO2
6.	CO6: Examine various cryptographic Algorithms	PO1, PO2, PO4,PO8 PO11, PSO2

PO and PSO mapping with level of strength for Course Name Computer Networks Lab (Course Code CSP252)

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Computer Networks Lab (Course Code CSP252)	CO1		2	-	-	-	-	-	-	-	-	2	3	-	3	-
	CO2	2	-	2	2	3	-	-	-	-	-	2	3		3	-
	CO3	3	2	-	2	-	2	-	-	-	-	-	-	2	-	2
	CO4	-	2	2	-	-	-	-	-	-	-	-	-	-	2	2
	CO5	2	2	2	2	-	-	-	-	-	-	-	-	-	2	-
	CO6	2	-	-	2	-	-	-	2	-	-	2	-	-	2	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code/ Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
Computer Networks (CSP 252)	1.5	1.33	1	1.33	0.5	0.33	-	0.33	-	-	1	1	0.33	2	0.67

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School: SET			
Program: B.tech			
Branch: CSE / IT		**Semester: 4th**	
1	Course Code	**CSP297** Course Name: Project Based Learning -2	
2	Course Title	Project Based Learning -2	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course Objective	10. To align student's skill and interests with a realistic problem or project 11. To understand the significance of problem and its scope 12. Students will make decisions within a framework	
6	Course Outcomes	Students will be able to: CO1: Identify and formulate problem statement with systematic approach. CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others. CO3: Design the problem solution as per the problem statement framed. CO4: Explain the characteristics, architecture of database approach, describe the components of the project. CO5: Fabricate and implement the solution by using different object oriented concepts like encapsulation, polymorphism etc. CO6: Develop a glory of the need to engage in life-long learning.	
7	Course Description	In PBL-1, the students will learn how to define the problem for developing projects, identifying the skills required for developing the project based on given a set of specifications and all subjects of that Semester.	
8	Outline syllabus		CO Mapping
	Unit 1	Problem Definition, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any.	CO1, CO2
	Unit 2	Develop a work flow or block diagram for the proposed system / software.	CO2,CO3
	Unit 3	Design algorithms for the proposed problem.	CO3
	Unit 4	Implementation of work under the guidance of a faculty member and obtain the appropriate results.	CO3, CO4
	Unit 5	Demonstrate and execute Project with the team. Validate and verify the project modules.	CO4, CO5, CO6
		Report should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, Implementation Detail. Validation Reports. References if any.	

		The presentation, report, work done during the term supported by the documentation, forms the basis of assessment.			
	Mode of examination	Practical /Viva			
	Weight age Distribution	CA	MTE	ETE	
		60%	NA	40%	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1: Identify and formulate problem statement with systematic approach.	PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
2.	CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others.	PO1, PO2, PO4, PO7, PO9, PO10, PO11, PO12 ,PSO3
3.	CO3: Design the problem solution as per the problem statement framed.	PO1, PO2, PO5, PO9, PO10, PO11, PO12, PSO1,PSO2
4.	CO4: Explain the characteristics, architecture of database approach, describe the components of the project.	PO1, PO2, PO6, PO9, PO10, PO11, PO12,PSO2
5.	CO5: Fabricate and implement the solution by using different object oriented concepts like encapsulation, polymorphism etc.	PO1, PO2, PO3, PO4,PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12 PSO1,PSO2, PSO3
6.	CO6: Develop a glory of the need to engage in life-long learning.	PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO3

PO and PSO mapping with level of strength for Course Name Project Based Learning -1 (Course Code CSP297)

CO/PO Mapping

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

Cos	Programme Outcomes(POs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	3	-	-	-	-	3	3	2	3	2	2	1
CO2	3	2	-	3	-	-	2	-	3	3	2	3			1
CO3	3	2	-	-	2	-	-	-	3	3	2	3	2	2	
CO4	3	3	-	-	-	2	-	-	3	3	2	3		2	
CO5	3	3	2	2	2	2	3	3	3	3	2	3	2	2	
CO6	3	3	-	3	-	-	-	-	3	3	2	3			1
Avg PO attainted	3	2.7	0.3	1.8	0.7	0.7	0.8	0.5	3	3	2	3	1	1.3	0.5

TERM-V

School: SET		**Batch :** 2021-2022	
Program:		**Academic Year:** 2021-2022	
Branch: CSE		**Semester:** V	
1	Course Code	**ARP 305**	Course Name : **Personality Development and Decision making Skills**
2	Course Title	**Personality Development and Decision making Skills**	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
	Course Status	Active	
5	Course Objective	To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 3rd phase of employability enhancement and skill building activity exercise.	
6	Course Outcomes	After completion of this course, students will be able to: CO1: Apply skills of personality development which will help a student groom to meet the needed social strata for establishing themselves in the society CO2: Build a positive behavioural attitude and attributes developing interpersonal skills for building positive and meaningful social and professional relationships CO3: Review and revise development plans to adapt to changing aspirations, circumstances and working environments CO4: Acquire higher level competency in use of numbers and digits, logical and analytical reasoning CO5: Develop higher level strategic thinking and diverse mathematical concepts through building cubes and cuboids. CO6: Demonstrate higher level quantitative aptitude such as analytical and statistical tools for making business decisions.	
7	Course Description	This bundles Training approach attempts to explore the personality, character, and the natural style of the student. This helps to develop character, personality, confidence and interpersonal abilities within the student along with level 3 readiness in quant, aptitude and reasoning skills	
8	Outline syllabus – ARP305		
	Unit 1	**Impress to Impact**	**CO**

			MAPPING
	A	What is Personality?| Creating a positive impression – The 3 V's of Impression | Individual Differences and Personalities	CO1
	B	Personality Development and Transformation | Building Self Confidence | Behavioural and Interpersonal Skills	CO2
	C	Avoiding Arguments | The Art of Assertiveness | Constructive Criticism | The Personal Effectiveness Grid | Assessing our Strengths & Limitations and Creating an Action Plan for Learning with the 4M Model | Verbal Abilities-3	CO3
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	
	A	Numbers & Digits , Mathematical Operations | Analytical Reasoning	CO4
	B	Cubes & Cuboids | Statement & Assumptions	CO5
	C	Strong & Weak Argument	CO5
	Unit 3	**Quantitative Aptitude**	
	A	Work & Time ,Pipes & Cistern	CO6
	B	Time ,Speed & Distance, Quadratic & Linear Equations, Logs & Inequalities	CO6
	C	Sequence & Series, Logarithms, Data Interpretation | Data sufficiency - Level 1	CO6
	Weightage Distribution	*(CA)Class Assignment/Free Speech Exercises / JAM – 60% | (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand | **Quantum CAT – Arihant Publications | Quicker Maths- M. Tyra** | Power of Positive Action (English, Paperback, Napoleon Hill) | Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon | Goal Setting (English, Paperback, Wilson Dobson*	

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PS O1	PSO 2	PSO 3
ARP305.1	-	-	-	-	-	1	-	-	1	2	1	2	-	-	-
ARP305.2	-	-	-	-	-	1	-	-	1	2	1	2	-	-	-
ARP305.3	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP305.4	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP305.5	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP305.6	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-

2.1 Template A1: Syllabus for Theory Courses (SAMPLE)

School:		**School of Engineering and technology**		
Department		**Department of Computer Science and Engineering**		
Program:		**B. Tech.**		
Branch:		**Computer Science and Enginering**		
1	Course Code	CSE021		
2	Course Title	Introduction to Cloud Computing		
3	Credits	3		
4	Contact Hours (L-T-P)	3	0	0
	Course Status	Core		
5	Course Objective	This introductory course on Cloud computing will teach both the fundamental concepts of how and why Cloud systems works, as well as Cloud technologies that manifest these concepts.		
6	Course Outcomes	At the end of the course, students will have achieved the following learning objectives. CO1. Define the basics of cloud and recall the computer Science concepts which are helpful in understanding on demand service architecture. CO2. Classify and describe the architecture and taxonomy of parallel and distributed computing, including shared and distributed memory, and data and task parallel computing. CO3. Apply the PAAS and SAAS to manage the workflow and use of cloud in scientific application. CO4. Categorize and Characterize between Infrastructure services, deployment models, and governance in cloud computing. Examine the design of task and data parallel distributed algorithms for Clouds and use them to construct Cloud applications. CO5. Evaluate the importance of cloud using monitoring and		

		management of services for performance improvement of HPC and to follow the Governance and Compliances. CO6. Elaborate the design concept and formulate to build the solution using cloud service providers as AWS, MS Azure, Google Cloud.Demonstrate the use of Map-Reduce, Vertex-Centric and Continuous Dataflow programming models.	
7	Course Description	This course is an introductory course for cloud computing concepts and helps in understanding the core functionalities, algorithms, models and workflows in cloud environment. In this course Students will get demonstrations of real-time cloud services for better exposure and research understanding.	
8	Outline syllabus		CO Mapping
	Unit 1	**FOUNDATIONS**	
	A	**Introduction to compute** Types of Computing, Grid computing, distributed computing, Client-server computing, Three Tier Architecture, use of Sockets and Remote Procedure Call, working of RMI and CORBA, Web services, Web Sockets, Message Queues and Message Brokers.	CO1
	B	**Introduction to Cloud Computing** Cloud Computing definition, Roots of Cloud Computing, Layers and Types of Clouds, Desired Features of a Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks	CO1
	C	**Migrating and Integrating into Cloud** Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration into a Cloud, Enriching the 'Integration as a Service' Paradigm for the Cloud Era, Evolution and Challenges of SaaS Paradigm, Integration Scenarios, The Integration Methodologies	CO1
	Unit 2	**ENTERPRISE CLOUD COMPUTING AND IAAS**	
	A	**The Enterprise Cloud Computing Paradigm** Issues for Enterprise Applications on the Cloud, Transition	CO1,CO2

		Challenges, Enterprise Cloud Technology and Market Evolution, Business Drivers Toward a Marketplace for Enterprise Cloud Computing, The Cloud Supply Chain	
	B	**Virtual Machines Provisioning and Migration Services** Introduction to Virtual Machines,The Anatomy of Cloud Infrastructures, VM Provisioning and Manageability, Virtual Machine Migration Services, Management of Virtual Machines for Cloud Infrastructures,, Distributed Management of Virtual Infrastructures, Scheduling Techniques	CO1,CO2
	C	**Enhancing Cloud Computing Environments Using a Cluster as a Service** Introduction and Related Work, RVWS Design, Cluster as a Service: The Logical Design, Secure Distributed Data Storage in Cloud Computing, Cloud Storage, Technologies for Data Security in Cloud Computing	CO1,CO2
	Unit 3	**PLATFORM AND SOFTWARE AS A SERVICE**	
	A	**Aneka and CometCloud** Aneka—Integration of Private and Public Clouds, Technologies and Tools for Cloud Computing, Aneka Cloud Platform, CometCloud: An Autonomic Cloud Engine, Introduction of CometCloud (Architecture, Autonomic Behavior, Applications overview)	CO1,CO3
	B	**Business Solutions and WorkFlow** Cloud-Based Solutions for Business Applications (Introduction of Enterprises Demand and Cloud Computing, Dynamic ICT Services), Workflow Engine for Clouds, Workflow Management Systems, Architecture of Workflow Management Systems	CO1,CO3, CO6
	C	**Scientific Applications and MapReduce Model** Scientific Application for Cloud Environments, Classification of Scientific Applications and Services in the Cloud, SAGA-based Scientific Applications, MapReduce Programming Model, MapReduce Impacts and Research Directions	CO1,CO3, CO6
	Unit 4	**MONITORING, MANAGEMENT & GOVERNANCE**	
	A	**SLA Management in Cloud Computing** Introduction of typical Use Cases, Model for Federated Cloud Computing, Security Considerations, SLA Management in Cloud Computing: A Service Provider's Perspective, Types of SLA, Life Cycle of SLA, Automated	CO1,CO4

		Policy-based Management	
	B	**Performance Predictions for HPC on Clouds** Introduction and Background of Grid and Cloud, HPC in the Cloud: Performance-related Issues, Game Hosting on Cloud Resources, Building Content Delivery Networks Using Clouds, Resource Cloud Mashups	CO1,CO4
	C	**Security and Governance** Basic Concept of Organizational Readiness, Drivers for Changes: Common Change Management Models, Security and Risk in the Cloud, Cloud Computing and Identity, Content Level Security—Pros and Cons, Legal Issues in Cloud Computing(PCI DSS), Data Privacy and Security Issues	CO1,CO4
	Unit 5	**AWS, MS AZURE AND GOOGLE CLOUD**	
	A	AWS Services:EC2, IAM, S3, Lambda, EBS, CDN, CloudWatch,	CO1, CO5,CO6
	B	MS Azure Services:Azure VM , SQL Server on Virtual Machines, Azure SQL Database,Azure Active Directory, Azure Backup	CO1,CO5, Co6
	C	Google Cloud: Compute Engine,Migrate for Compute Engine, Cloud Functions, Gsuite Admin,Cloud Lab Balancing ,Cloud Storage	CO1,CO5, CO6
	Mode of examination	Theory/Jury/Practical/Viva	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	CLOUD COMPUTING Principles and Paradigms, Edited by Rajkumar Buyya, Jam Cloud Computing: A Practical Approach, Anthony T. Velte, Toby J. Velte, Robert Elsenpeter	
	Other References		

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	Define the basics of cloud and recall the computer Science concepts which are helpful in understanding on demand service architecture. Classify and describe the architecture and taxonomy of parallel and distributed computing, including shared and distributed memory, and data and task parallel computing.	PO1,PO2,PO3,PO4
2.	Define the basics of cloud and recall the computer	PO1,PO2,PO3,PO4
3.	Apply the PAAS and SAAS to manage the workflow and use of cloud in scientific application.	PO1,PO2,PO3,PO4,PSO2 ,PSO3
4.	Categorize and Characterize between Infrastructure services, deployment models, and governance in cloud computing. Examine the design of task and data parallel distributed algorithms for Clouds and use them to construct Cloud applications.	PO1,PO2,PO3,PO4,PSO2 ,PSO3
5.	Evaluate the importance of cloud using monitoring and management of services for performance improvement of HPC and to follow the Governance and Compliances	PO1,PO2,PO3,PO4,PSO2 ,PSO3
6.	Elaborate the design concept and formulate to build the solution using cloud service providers as AWS, MS Azure, Google Cloud.Demonstrate the use of Map-Reduce, Vertex-Centric and Continuous Dataflow programming models.	PO1,PO2,PO3,PO4,PSO1 ,PSO2,PSO3

PO and PSO mapping with level of strength for Course Name xxxx (Course Code yyyy)

Course Code_ Course Name	CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Yyyy_xxxx	CO1	2	3	1	2											

	CO2	2	2	2	3											
	CO3	1	3	1	2										2	3
	CO4	3	1	2	2										3	2
	CO5	2	2	3	1										2	2
	CO6	1	3	1	2									2	3	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	**Course Name**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
		1.83	2.33	1.66	2									.33	1.66	1.67

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

2.1 Template A1: Syllabus for Theory Courses

School:		**School of Engineering and technology**	
Department		**Department of Computer Science and Engineering**	
Program:		**B-Tech**	
Branch:		**Computer Science and Engineering**	
1	Course Code	CSE 024	
2	Course Title	Web Technologies	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Status	Core /Elective/Open Elective	
5	Course Objective	The objective of this course is to provide a foundation of technologies and technical skills in web development. Based upon the development of a web, this course provides an insight of computer and networking technologies, and hands on experience in web programming.	
6	Course Outcomes	CO1: Define the basic concept of HTML CO2: Illustrate the basics of PHP CO3:Develop interactive web pages using HTML5 and CSS3 CO4:Design web pages/site having validation on user data access. CO5:Compare relationship of HTML,Javascript and PHP CO6:Develop web site for business and organization or for individual	
7	Course Description	The purpose of this course is to give students the basic understanding of Web pages and technologies to be used for designing web sites.	
8	Outline syllabus		CO Mapping
	Unit 1	**HTML & HTML 5**	
	A	HTML basic tags, various links implementation, image ,image map, table formatting, Lists, form design.	CO1
	B	Page layout design using frame, div and span tag, iframe	CO1
	C	HTML5: New elements, canvas, offline webpage, HTML Media: video, audio	CO1,CO3
	Unit 2	**CSS &CSS3**	
	A	Introduction, syntax, selector: class and id, text formatting, margin, align, pseudo-class, pseudo-element	CO3
	B	Positioning, background formatting, Navigation bar, and image gallery.	CO3
	C	CSS3: Introduction, colors, text formatting, fonts formatting, Background formatting, 2D transform, animation	CO3
	Unit 3	**Java script**	
	A	Introduction, syntax, comment, statement, variable, operators	CO4,CO5

	B	Conditional statements, looping statements, Functions			CO4,CO5
	C	Object, events, Accessing form elements, validating form elements,popup windows.			CO4,CO5
	Unit 4	**PHP Basics**			
	A	Introduction to PHP, syntax, variables, operators			CO2,CO5
	B	Conditional statement, iterative statements,Functions			CO2,CO5
	C	Array: single, multi dimensional, numeric array, associative array			CO2,CO5
	Unit 5	**File Handling in PHP**			
	A	File Operation: Reading & writing data on web page from file, deleting file, renaming file			CO5,CO6
	B	Session Management: introduction, creation, destroying and login session management			CO5,CO6
	C	PHP Database Connectivity, Retrieving records, retrieving fields from record			CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Ivan Bayross,"HTML,DHTML, JavaScript, Perl & CGI", BPB Publication 2. Schildt H, "The Complete Reference JAVA2", TMH 3. Schildt H, "The Complete Reference J2EE", TMH			
	Other References	1. Rick Delorme," Programming in HTML5 with JavaScript and CSS3", Microsoft			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	Define the basic concept of HTML	PO5,PSO2
2.	Illustrate the basics of Extensible markup language.	PO5,PSO2,PO12
3.	Develop interactive web pages using HTML5 and CSS3	PO2,PO3,PO5,PO6,PO9, PSO1,PSO2,PSO3
4.	Design web pages/site having validation on user data access.	PO2,PO3,PO5,PO6,PO9, PSO1,PSO2,PSO3
5.	Compare relationship of HTML,Javascript and PHP	PO5,PSO2
6.	Develop web site for business and organization or for individual	PO1, PO2,PO3,PO4,PO5,PO6, PO7,PO9,PO11,PO12,PSO1,PSO2,PSO3

PO and PSO mapping with level of strength for Course Name Web Technologies **(Course Code CSE352)**

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO3
CSE 352_ Web Technologies	CO1					1									1	
	CO2					3							1		1	
	CO3		1	3		2	1			2				1	2	2
	CO4		1	3		1	1			2				1	2	2
	CO5					2									1	
	CO6	2	3	3	1	3	3	1		3		2	2	1	2	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
Cse 352	Web Technologies	2	1.6	2.3	1	2	1.6	1	0	2.2	0	2.3	1.5	1	1.5	2.2

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

School: SET			
Program:B.Tech			
Branch:CSE		**Semester:V**	
1	Course Code	CSE354 | Course Name: Design and Analysis of Algorithms	
2	Course Title	Design and Analysis of Algorithms	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	UG	
5	Course Objective	Objective of this course is to 1. Reinforce basic design concepts (e.g., pseudocode, specifications, top-down design) 2. Knowledge of algorithm design strategies 3. Familiarity with an assortment of important algorithms. 4. Enable students to analyze time and space complexity	
6	Course Outcomes	Students will be able to: **CO1: Analyze** the asymptotic performance of algorithms **CO2**: **Describe** the dynamic-programming and Greedy paradigm and explain when an algorithmic design situation calls for it. **CO3: Demonstrate** a familiarity with major algorithms and data structures **CO4: Apply** important algorithmic design paradigms and methods of analysis **CO5: Discuss** NP-complete problems and develop algorithms to solve the problems. **CO6: Choose** appropriate algorithm design techniques for solving problems.	
7	Course Description	This course introduces concepts related to the design and analysis of algorithms. Specifically, it discusses recurrence relations, and illustrates their role in asymptotic and probabilistic analysis of algorithms. It covers in detail greedy strategies divide and conquer techniques, dynamic programming and max flow - min cut theory for designing algorithms, and illustrates them using a number of well-known problems and applications.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction**	
	A	Introduction : Algorithms, Analyzing algorithms, Complexity of algorithms, Growth of functions, Performance measurements	CO1, CO3
	B	Asymptotic Notations and their properties – Mathematical analysis for Recursive and Non-recursive algorithms, Recurrences relations, Master Method	CO1, CO2, CO3
	C	Divide-and-conquer: Analysis and Structure of divide-and-conquer algorithms, Divide-	CO1, CO2, CO4

		and-conquer examples-Quick sort, Merge sort, Sorting in Linear Time, Heap Sort	
	Unit 2	**Dynamic Programming**	
	A	Overview, Difference between dynamic programming and divide and conquer, All pair shortest path problems: Floyd-Warshall Algorithm	CO1,CO2,CO3, CO4
	B	Applications and analysis: Matrix Chain Multiplication, 0/1 Knapsack Problem	CO1, CO2, CO3, CO4
	C	Applications and analysis: Longest Common sub-sequence, Optimal Binary Search tree	
	Unit 3	**Greedy Method**	CO1,CO2,CO3
	A	Overview of the Greedy paradigm, Analysis and example: task scheduling,	CO1,CO2,CO3
	B	Fractional Knapsack problem, Single source shortest paths problem: Dijkastra's Algorithm, Bellman-ford Algorithm,	CO1,CO2,CO3
	C	Overview and analysis of Backtracking & Branch and Bound: N-Queens problem and Sum of subsets	
	Unit 4	**Selected Topics**	CO1,CO2,CO3,
	A	Introduction to NP Complete and NP Hard Problems, Examples, Amortized Analysis	CO1,CO2,CO3,
	B	Approximation Algorithms – Travelling Sales Person Problem and Vertex Cover Problem, Randomized Algorithms, Randomized Quick Sort Algorithm	CO1,CO2,CO3
	C	String Matching Algorithms – Naive String Matching Algorithm, Rabin Karp Algorithm.	CO1,CO2,CO3, CO4
	Unit 5	**Advanced Data Structures**	
	A	Red-Black Trees - Definition, Applications, Insertion and deletion of elements in RB-Tree	CO1, CO2, CO3, CO4
	B	B-Trees - Definitions, Applications, Insertion and Deletion in B-Trees	CO1, CO2, CO4
	C	Data Structure for Disjoint Sets – Definition, Binomial Heaps, Fibonacci Heaps.	CO1, CO2, CO3, CO4
	Mode of examination	Theory	
	Weightage Distribution	CA: 30% / MTE: 20% / ETE: 50%	
	Text book/s*	3. Cormen et al., "Introduction of Computer Algorithms", Prentice Hall India	
	Other References	4. Sahni et al., "Fundamentals of Computer Algorithms", Galgotia Publications. 5. Hopcroft A, The Design And Analysis	

		Computer Algorithms, Addison Wesley	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**CO1: Analyze** the asymptotic performance of algorithms	PO1, PO2, PO3, PO4, PO9, PSO1, PSO2, PSO3
2.	**CO2**: **Describe** the dynamic-programming and Greedy paradigm and explain when an algorithmic design situation calls for it.	PO1, PO2, PO3, PO4, PO9, PSO1, PSO2, PSO3
3.	**CO3: Demonstrate** a familiarity with major algorithms and data structures	PO1, PO2, PO3, PO9, PSO1, PSO2
4.	**CO4: Apply** important algorithmic design paradigms and methods of analysis	PO1, PO2, PO3, PO4, PO9, PSO1, PSO2, PSO3
5.	**CO5: Discuss** NP-complete problems and develop algorithms to solve the problems.	PO1, PO2, PO3, PO4, PO9, PSO1, PSO2, PSO3
6.	**CO6: Choose** appropriate algorithm design techniques for solving problems.	PO1, PO2, PO3, PO4, PO5, PO9, PSO1, PSO2

PO and PSO mapping with level of strength for Course Name Design and Analysis of Algorithms Course Code CSE 354)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	1	2	-	--	--	-	2	-	-	-	3	2	2
CO2	2	2	2	2	-	--	--	-	3	-	-	-	2	3	2
CO3	2	1	2	-	-	--	--	-	1	-	-	-	3	2	-
CO4	1	2	2	3	-	--	--	-	2	-	-	-	2	2	2
CO5	3	3	1	3	-	-	-	-	3	-	-	-	2	1	3
CO6	2	2	3	2	2	-	-	--	2	-	-	-	3	2	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3

CSP 354	**Design and Analysis of Algorithms Lab**	2	2.17	1.83	2.4	2	-	-	-	2.2	-	-	-	2.5	2	2.3

Syllabus: Design and Analysis of Algorithm lab

School:		**Batch:**
Program:		**Current Academic Year:**
Branch:		**Semester:**
1	Course Code	CSP 350
2	Course Title	**Design and Analysis of Algorithm lab**
3	Credits	
4	Contact Hours (L-T-P)	0-0-2
	Course Status	Compulsory/Elective
5	Course Objective	Objective of this course is to 1. Reinforce basic design concepts (e.g., pseudocode, specifications, top-down design) 2. Knowledge of algorithm design strategies 3. Familiarity with an assortment of important algorithms. • Enable students to analyze time and space complexity
6	Course Outcomes (same as theory course)	Students will be able to: **CO1: calculate** time complexity of searching algorithm **CO2**: **Write** program based on dynamic programming. **CO3: apply** greedy algorithm to any problem **CO4: develop** program based on advanced data structure CO5: **design** a program based on different string matching algorithm CO6**: implement** real world problem based on greedy and dynamic algorithm
7	Course Description	This course introduces concepts related to the design and analysis of algorithms. Specifically, it discusses recurrence relations, and illustrates their role in asymptotic and probabilistic analysis of algorithms. It covers in detail greedy strategies divide and conquer techniques, dynamic programming and max flow - min cut theory for designing algorithms, and illustrates them using a number of well-known problems and applications.
8	Outline syllabus	CO Mapping
	Unit 1	**Practical based on Searching and sorting**
		1. WAP to demonstrate the concept of Linear and Binary Search 2. WAP to implement Merge sort 3. WAP to implement Quick Sort — CO1
	Unit 2	**Practical based on Dynamic Programming**
		1. WAP to implement Matrix Chain Multiplication problem — CO2, CO6

		2. WAP to demonstrate the concept of Longest Common Subsequence(LCS) 3. WAP to demonstrate concept of 0 – 1 Knapsack Problem	
	Unit 3	**Practical based on Greedy Programming**	
		1. WAP to demonstrate concept of Minimum Spanning Tree(Prim's Algorithm) 2. WAP to demonstrate concept of Fractional Knapsack Problem 3. WAP to implement single source shortest problem using Dijkstra's Algorithm	CO3, CO6
	Unit 4	**Practical based on Advance concepts**	
		WAP to demonstrate concept of Red Black Tree insertion and Deletion	CO4
	Unit 5	**Practical based on String Matching**	
		1. WAP to demonstrate the concept of Naïve String matching algorithm. 2. WAP to demonstrate the concept of Robin Karp Algorithm.	CO5
	Mode of examination	Jury/Practical/Viva	
	Weightage Distribution	CA / MTE / ETE 60% / 0% / 40%	
	Text book/s*	-	
	Other References		

PO and PSO mapping with level of strength for Course Name Design and Analysis of Algorithms Lab. Course Code CSP 350)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3	1	--	--	-	2	-	-	-	2	3	3
CO2	2	3	3	2	2	--	--	-	2	-	-	-	3	2	2
CO3	3	2	2	-	3	--	--	-	1	-	-	-	2	1	-
CO4	2	3	3	3	1	--	--	-	3	-	-	-	3	3	1
CO5	3	2	2	3	2	-	-	-	2	-	-	-	2	3	2

CO6	2	3	3	1	3	-	-	--	1	-	-	-	3	2	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CSP 350	**Design and Analysis of Algorithms Lab**	2.5	2.7	2.5	2.4	2	-	-	-	1.8	-	-	-	2.5	2.3	2.2

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

Branch: CSE / IT		Semester: 5th	
1	Course Code	**CSP354** Course Name: Project Based Learning -3	
2	Course Title	Project Based Learning -3	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course Objective	13. To align student's skill and interests with a realistic problem or project. 14. To understand the significance of problem and its scope. 15. Students will make decisions within a framework.	
6	Course Outcomes	Students will be able to: CO1: Identify and formulate problem statement. CO2: Design relational database schema. CO3: Develop the solution by using different aspects of programming language. CO4: Classify and understand various test techniques for verification and validation of project. CO5: Analyze and make use of modern for solving real word problems. CO6: Develop teamwork and need to engage in life-long learning, along with the ability to communicate effectively with others.	
7	Course Description	In PBL-3, the students will learn how to define the problem for developing projects, and Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.	
8	Outline syllabus		CO Mapping
	Unit 1	Problem Definition and identification, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any.	CO1,CO4
	Unit 2	Use of the relational algebra operations from mathematical set theory (union, intersection, difference, and Cartesian product) and the relational algebra operations developed specifically for relational databases (select (restrict), project, join, and division)..	CO2,CO6
	Unit 3	Design; implement project work in any programming language.	CO3
	Unit 4	Use of various test tools and techniques for software verification and validation of project	CO4,CO5
	Unit 5	Demonstrate and execute Project with the team.	CO6
		Report should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, ER diagrams, Use Case Diagrams, State Diagrams, Sequence Diagrams, Communication	

		Diagrams, and Activity Diagrams, Implementation Detail. Validation Reports. References, Test cases if any. The presentation, report, work done during the term supported by the documentation, forms the basis of assessment.			
	Mode of examination	Practical /Viva			
	Weight age Distribution	CA			MTE
		60%	NA	ETE	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1: Identify and formulate problem statement.	PO1, PO2, PO4,PO6, PO8,PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
2.	CO2: Design relational database schema.	PO1, PO2, PO3,PO4,PO5, PO7, PO8, PO9, PO11, PO12 , PSO1,PSO2,PSO3
3.	CO3: Develop the solution by using different aspects of programming language.	PO1, PO2, PO3,PO4,PO5, PO6, PO8, PO9, PO11, PO12, PSO1,PSO2
4.	CO4: Classify and understand various test techniques for verification and validation of project.	PO1, PO2, PO3,PO4,PO5, PO8,PO9, PO10, PO11, PO12 ,PSO1,PSO2,PSO3
5.	CO5: Analyze and make use of modern for solving real word problems.	PO1, PO2, PO5, PO6, PO7, PO8, PO9, PO12 PSO1,PSO2
6.	CO6: Develop teamwork and need to engage in life-long learning, along with the ability to communicate effectively with others.	PO2, PO4, PO8,PO9, PO10, PO11, PO12,PSO1,PSO3

PO and PSO mapping with level of strength for Course Name Project Based Learning -3 (Course Code CSP354)

CO/PO Mapping

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

Cos	Programme Outcomes(POs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	2	-	1	-	1	2	-	2	1	2	2	3
CO2	3	2	2	2	2	-	-	1	2	-	2	1	2	1	1
CO3	3	2	2	2	2	3	-	1	2	-	2	1	2	2	-
CO4	3	3	2	2	3	-	-	1	2	-	-	1	2	2	2
CO5	3	2	-	-	3	-	-	1	2	-	-	1	2	2	-
CO6		1	-	1	-	-	-	2	2	3	3	3	1	-	1

Avg PO attained	3	2.2	1	1.5	1.7	0.7	0	1.2	2	1	2	1	2	1.5		1.2

Syllabus: CSP 391, Summer Internship-II

School: SET		**Batch: 2018-2022**	
Program:B.Tech		**Current Academic Year: 2019-20**	
Branch: CSE		**Semester**	
1	Course Code	CSP391	Course Name: **Summer Internship-II**
2	Course Title	**Summer Internship-II**	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	UG	
5	Course Objective	1. Experience the activities and functions of business professionals. 2. Develop and refine oral and written communication skills. 3. Identify areas for future knowledge and skill development.	
6	Course Outcomes	Students will be able to: CO1. Integrate the concepts and strategies of academic study in a real time environment. CO2. Identify, formulate and model problems and find engineering solution based on a systems approach. CO3. Develop teamwork and apply prior acquired knowledge in problem solving. CO4. Develop communication, interpersonal and other critical skills required for career growth. CO5. Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards. CO6. Explore career alternatives prior to graduation.	
7	Course Description	An internship experience provides the student with an opportunity to explore career interests while applying knowledge and skills learned in the classroom in a work setting. The experience also helps students gain a clearer sense of what they still need to learn and provides an opportunity to build professional networks.	
8	Outline syllabus		CO Mapping
	Unit 1	Define objectives and conditions for the internship, ensuring students that it is related to the study path carried out at the University	**CO1,CO2**
	Unit 2	Problem Definition and identification, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any.	**CO2**
	Unit 3	The internship work plan is drawn up by developing team work and applies prior acquired knowledge in problem solving.	**CO3**
	Unit 4	Demonstrate and execute Project with the team. Submission of evaluation form and final report completed by the intern.	**CO4**
	Unit 5	Final evaluation form completed by the supervisor at the Host Organization and final presentation before departmental committee.	**CO5,CO6**
	Mode of examination	Practical	

	Weightage Distribution	CA	MTE	ETE	
		60%	NIL	40%	
	Text book/s*	NA			
	Other References	NA			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1. Integrate the concepts and strategies of academic study in a real time environment.	PO1,PO2,PO4,PO5 ,PO7,PO8,PO9,PS O1,PSO2,PSO3
2.	CO2. Identify, formulate and model problems and find engineering solution based on a systems approach.	PO1,PO2,PO3,PO4 ,PO5,PO7,PO8,PO 9, PSO1,PSO2
3.	CO3. Develop teamwork and apply prior acquired knowledge in problem solving.	PO1,PO3,PO4,PO5 , PO8,PO9,PO11,PO 12, PSO1,PSO2,PSO3
4.	CO4. Develop communication, interpersonal and other critical skills required for career growth.	PO8,PO10
5.	CO5. Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards.	PO6,PO8
6.	CO6. Explore career alternatives prior to graduation.	PO12,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Summer Internship-II (CSP391)

CO/PO Mapping (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low															
Cos	Programme Outcomes(POs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	2	2	-	3	2	-	1	1	1	-	-	-	1	2	2
CO2	1	2	1	2	2	-	1	1	1	-	-	-	1	2	-
CO3	2	-	2	2	2	-	-	1	3	-	1	1	1	2	2
CO4	-	-	-	-	-	-	-	1	-	3	-	-	-	-	-
CO5	-	-	-	-	-	2	-	3	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-
Avg PO attained	1	0.7	0.5	1.2	1	0.3	0.3	1.2	1	1	0	1	1	1.3	0.7

Technical Skill Enhancement Course-1 (Simulation Lab)

School: SET		**Batch: 2019-2023**	
Program: B.TECH		**Current Academic Year: 2019-2020**	
Branch:CSE		**Semester: V**	
1	Course Code	CSP 395	Technical Skill Enhancement Course-1 (Simulation Lab)
2	Course Title	Simulation Lab	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Lab	
5	Course Objective	The objective of this course is to provide the basic programming conceptsof MATLAB such as – functions, arrays, loops, conditional statements, procedures.It alsoexpose students with visual representations of a model and its results.	
6	Course Outcomes	Students will be able to: **CO1:**Use basic fundamentals to write simple Matlab programs. **CO2:** Plot graphs in Matlab and use procedural functions. **CO3**: Writing Matlab programs with logic and flow control. **CO4:**Manipulate and work with text files. **CO5**:Make use of graphical user interfaces in MATLAB. **CO6**: Apply MATLAB Programming to solve real life problem	
7	Course Description	This course introduces the concepts of MATLAB programming, Modelling and simulation to identify the problems, and choose the relevant models and algorithms to apply. Matlab is used for scientific applications involving images, sound, and other signals.	
8	Outline syllabus		CO Mapping
	UNIT-1	**Introduction to MATLAB**	CO1,CO6
	A	Programming Environment: MATLAB Windows, A First Program	
	B	Expressions, Constants, Variables and assignment statement	
	C	Arrays	
	UNIT-2	**Graph Plots&Procedures and Functions**	CO2,CO6
	A	Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save	
	B	Procedures and Functions: Arguments and return values, M-files	
	C	Formatted console input-output, String handling	
	UNIT-3	**Control Statements**	CO3,CO6
	A	Conditional statements: If, Else, Else-if	
	B	Repetition statements: While	
	C	Repetition statements: for loop	
	UNIT-4	**Manipulating Text**	CO4,CO6

	A	Writing to a text file, Reading from a text file			
	B	Randomising and sorting a list			
	C	Searching a list			
	UNIT-5	**GUI Interface**			CO5,CO6
	A	Attaching buttons to actions			
	B	Getting Input, Setting Output			
	C	Develop MATALB Application			
	Mode of examination				
	Weightage Distribution	Project on Simulation based	ETE		
		60 %	40%		
	Text book/s*				
	Other References	1.			

CO and PO Mapping

Mapping between Cos and Pos, PSO's		
Sl. No.	**Course Outcomes (COs)**	**Mapped Program Outcomes and PSO's**
1	**CO1:**Use basic fundamentals to write simple Matlab programs.	**PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3**
2	**CO2:** Plot graphs in Matlab and use procedural functions.	**PO1,PO3,PO5,PO10,PO12,PSO1,PSO2,PSO3**
3	**CO3**: Writing Matlab programs with logic and flow control.	**PO1,PO2,PO3,PO5,PO12,PSO1,PSO2,PSO3**
4	**CO4:**Manipulate and work with text files.	**PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3**
5	**CO5**:Make use of graphical user interfaces in MATLAB.	**PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3**
6	**CO6**: Apply MATLAB Programming to solve real life problem	**PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO11,PO12,PSO1,PSO2,PSO3**

PO and PSO mapping with level of strength for Course Name: Technical Skill Enhancement Course-1 CSP 395)

1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)

COs	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO 10	PO1 1	PO 12	PSO 1	PSO2	PSO3
CO1	1	-	1	-	2	-	-	-	-	-	-	1	1	2	1
CO2	1	-	1	-	2	-	-	-	-	2	-	1	1	2	1
CO3	1	2	1	-	2	-	-	-	-	-	-	1	1	2	1
CO4	1	-	1	-	2	-	-	-	-	-	-	1	1	2	1
CO5	1	-	1	-	2	-	-	-	-	-	-	1	1	2	1
CO6	2	2	3	3	2	2	1	-	2	3	2	2	2	3	1
Avg PO attained	1	0.7	1.3	0.5	2	0.3	0.2	0	0	1	0	1	1	2.2	1

2.1 Template A1: Syllabus for Theory Courses (SAMPLE)

School:		**School of Engineering and technology**		
Department		**Department of Computer Science and Engineering**		
Program:		**B.Tech**		
Branch:		**Cyber Security and Forensics**		
1	Course Code	INT021		
2	Course Title	Ethical Hacking		
3	Credits	3		
4	Contact Hours (L-T-P)	3-0-0		
	Course Status	core		
5	Course Objective	To provide students about the Ethical hacking Concepts, importance of ethical hacking in IT and Working structure of hacking		
6	Course Outcomes	On successful completion of this module students will be able to: CO1: Define the description of ethical Hacking CO2: Illustrate Types of Ethical Hacking. CO3: Explain about web and network hacking CO4: Demonstrate report writing and Mitigation CO5: Formulate the use of safe techniques on the World Wide Web CO6: Analyze various digital forensic problems		
7	Course Description	This course introduces ethical hacking concept and application of ethical hacking in network security.		
8	Outline syllabus			Outline syllabus
	Unit 1	Introduction to Ethical Hacking		
	A	Security Fundamental, Security testing, Hacker and Cracker, Descriptions		CO1
	B	Test Plans-keeping It legal, Ethical and Legality		CO1, CO2
	C	The Attacker's Process, The Ethical Hacker's Process, Security and the Stack		CO1, CO2,CO4
	Unit 2	Footprinting and Scanning		
	A	Information Gathering, Determining the Network Range, Identifying Active Machines		CO1, CO2
	B	Finding Open Ports and Access Points, OS Fingerprinting Services, Mapping the Network Attack Surface		CO1, CO2
	C	Enumeration, System Hacking		CO1, CO2,CO5,CO6
	Unit 3	Malware Threats		
	A	Viruses and Worms, Trojans, Covert Communication		CO1,CO2,CO3

	B	Keystroke Logging and Spyware, Malware Counter measures			CO1,CO2,CO3
	C	Sniffers, Session Hijacking, Denial of Service and Distributed, Denial of Service			CO1,CO2,CO3
	Unit 4	Web Server Hacking			
	A	Web Server Hacking, Web Application Hacking			CO2,CO3,CO4
	B	Database Hacking			CO3,CO4
	C	Wireless Technologies, Mobile Device Operation and Security, Wireless LANs			CO2, CO4,CO5
	Unit 5	IDS, Firewalls and Honeypots			
	A	Intrusion Detection Systems, Firewalls, Honeypots			CO2,CO5,
	B	Physical Security, Social Engineering			CO3,CO5,CO6
	C	Case Studies			CO4,CO5,CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1.Ec-Council, "Ethical Hacking and Countermeasures: Attack Phases", Delmar Cengage Learning, 2009. 2. Michael T. Simpson, Kent Backman, James E. Corley, "Hands-On Ethical Hacking and Network Defense", Cengage Learning, 2012			
	Other References	3. Patrick Engebretson, "The Basics of Hacking and Penetration Testing – Ethical Hacking and Penetration Testing Made Easy", Syngress Media, Second Revised Edition, 2013. 4. Jon Erickson, "Hacking: The Art of Exploitation", No Starch Press, Second Edition, 2008.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Define the description of ethical Hacking	PO1,PO2, PO5, PO8,PO12,PSO3
2.	CO2: Illustrate Types of Ethical Hacking.	PO1, PO2, PO3, PSO3
3.	CO3: Explain about web and network hacking	PO1, PO2, PO3, PO5, PO9, PO12, PSO1
4.	CO4: Demonstrate report writing and Mitigation	PO1, PO2, PO4, PO5, PO6, PO8, PSO2

5.	CO5: Formulate the use of safe techniques on the World Wide Web	PO1, PO2, PO3,PO8,PO9,PSO2,
6.	CO6: Analyze various digital forensic problems	PO1, PO2, PO4, PO5, PO6,PO7,PO10,PO11,PSO1

PO and PSO mapping with level of strength for Course Name Ethical Hacking (Course Code INT 021)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PS O2	PS O3
Ethical Hacking (Course Code INT 021)	CO1	3	3	-	-	2	-	-	3	-	-	-	3	-	-	3
	CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	3
	CO3	3	3	2	-	2	-	-	-	2	-	-	2	3	-	-
	CO4	3	3	-	3	2	3	-	2	-	-	-	-	-	3	-
	CO5	3	2	3	-	-	-	-	3	3	-	-	-	-	3	-
	CO6	3	3	-	3	3	3	3	-	-	3	3	-	3	-	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	P O 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PSO 3
INT 021	Ethical Hacking	3	2.7	2.3	3	2. 25	3	3	2.6	2.5	3	3	2.5	3	3	3

Strength of Correlation

1. Addressed to***Slight (Low=1)extent2.*** Addressed to***Moderate (Medium=2) extent***
3. Addressed to***Substantial (High=3) extent***

TERM-VI

School: SET		Batch : 2021-2022	
Program:		Current Academic Year: 2021-2022	
Branch: CSE		Semester: VI	
1	Course Code	ARP 306	Course Name : Campus to Corporate
2	Course Title	Campus to Corporate	
3	Credits	2	
4	Contact Hours (L-T-P)	1-0-2	
	Course Status	Active	
5	Course Objective	To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 4th phase of employability enhancement and skill building activity exercise.	
6	Course Outcomes	After completion of this course, students will be able to: CO1: Develop a creative resumes, cover letters, interpret job descriptions and interpret KRA and KPI statements and art of conflict management. CO2: Build negotiation skills to get maximum benefits from deals in practical life scenarios. CO3: to Develop skills of personal branding to create a brand image and self-branding CO4: Acquire higher level competency in use of logical and analytical reasoning such as direction sense, strong and weak arguments CO5: Develop higher level strategic thinking and diverse mathematical concepts through building analogies, odd one out CO6: Demonstrate higher level quantitative aptitude such as average, ratio & proportions, mixtures & allegation for making business decisions.	
7	Course Description	This penultimate stage introduces the student to the basics of Human Resources. Allows the student to understand and interpret KRA | KPI and understand Job descriptions. A student also understands how to manage conflicts, brand himself/herself, understand relations and empathise others with level-4 of quant, aptitude and logical reasoning	

8	Outline syllabus – ARP 306		
	Unit 1	**Ace the Interview**	**CO MAPPING**
	A	HR Sensitization (Role Clarity | KRA | KPI | Understanding JD) | Conflict Management	CO1
	B	Negotiation Skills | Personal Branding	CO3, CO4
	C	Uploading & Curating Resumes in Job Portals, getting Your Resumes Noticed | Writing Cover Letters | Relationship Management | Verbal Abilities-4	CO1, CO3
	Unit 2	**Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical**	
	A	Sitting Arrangement & Venn Diagrams | Puzzles | Distribution | Selection	CO4
	B	Direction Sense | Statement & Conclusion | Strong & Weak Arguments	CO4
	C	Analogies, Odd One out | Cause & Effect	CO5
	Unit 3	**Quantitative Aptitude**	
	A	Average , Ratio & Proportions, Mixtures & Allegation	CO6
	B	Geometry-Lines, Angles & Triangles	CO6
	C	Problem of Ages | Data Sufficiency - L2	CO6
	Weightage Distribution	*(CA)Class Assignment/Free Speech Exercises / JAM – 60% | (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%*	
	Text book/s*	*Wiley's Quantitative Aptitude-P Anand* | ***Quantum CAT – Arihant Publications*** | ***Quicker Maths- M. Tyra*** | *Power of Positive Action (English, Paperback, Napoleon Hill) | Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon | Goal Setting (English, Paperback, Wilson Dobson*	

COs	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PS O1	PSO 2	PSO 3
ARP306.1	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP306.2	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP306.3	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP306.4	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP306.5	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-
ARP306.6	1	-	-	-	-	-	-	-	1	2	1	2	-	-	-

School: SET		**Batch : 2019-2023**	
Program: B-TECH		**Current Academic Year: 2019-20**	
Branch: CSE		**Semester: VI**	
1	**Course Code**	**CSA031**	**Course Name: Digital Image Processing**
2	**Course Title**	**Digital Image Processing**	
3	**Credits**	**3**	
4	**Contact Hours (L-T-P)**	**3-0-0**	
	Course Status	**Program Elective 3**	
5	**Course Objective**	The objective of this course is to introduce the students to the fundamental techniques and algorithms used for acquiring, processing and extracting useful information from digital images. Particular emphasis will be placed on covering methods used for image sampling and quantization, image transforms, image enhancement and restoration, image encoding, image analysis and pattern recognition. In addition, the students will learn how to apply the methods to solve real-world problems in several areas including medical, remote sensing and surveillance and develop the insight necessary to use the tools of digital image processing (DIP) to solve any new problem	
6	**Course Outcomes (CO's)**	The Successful Completion of the Course Enables the Students to achieve the following learning Objectives: CO-7. Define the fundamental concepts of a digital image processing system. CO-8. Classify images in the frequency domain using various transformations. CO-9. Apply various operations for image enhancement and image restoration. CO-10. Analyse image segmentation and various representation techniques. CO-11. Choose various morphological operations for Digital Image processing. CO-12. Discuss and Build various image processing techniques for real life applications.	
7	**Course Description**	Images and Visual information are integral parts of our daily lives. Digital image processing plays an important role in various practical applications including television, medical imaging modalities such as X-ray or ultrasound, photography, security, astronomy and remote sensing. This subject will introduce the fundamentals of image processing and manipulation, while image applications will be used for illustrations etc. The subject emphasizes general principles of image processing rather than specific applications and also to know and understand how computers can process digital images and some of the fundamental operations in image processing.	
8	**Syllabus Outline**		**CO Mapping**
	Unit 1	**Introduction**	
	A	Fundamental of digital image processing, Elements of Visual Perception system, Applications of Digital Image Progressing	CO1
	B	Image Sampling and Quantization, Relationships between pixels , Image Sensing and Acquisition	CO1
	C	Color image fundamentals – RGB, HSI models, Two-dimensional mathematical preliminaries, 2D transforms – DFT, DCT, DWT.	CO1
	Unit 2	**Image Enhancement in Spatial and Frequency Domain**	
	A	Spatial Domain: Gray level Transformations, Histogram Processing , Basics of Spatial Filtering, Smoothing and Sharpening Spatial Filtering	CO2
	B	Frequency Domain: Introduction to Fourier	CO2

		Transform– Low-pass filter in frequency domain	
	C	High-pass filters in frequency domain	CO2
	Unit 3	**Image Restoration and Compression**	
	A	Restoration Process model, Noise models , Mean Filters, Order Statistics, Adaptive filters	CO3
	B	Frequency Domain Filtering: Band reject Filters, Band pass Filters , Notch Filters, Optimum Notch Filtering, Inverse Filtering, Wiener filtering	CO3
	C	Encoder-Decoder model, Types of redundancies, Brief Overview of Lossy and Lossless Compression Techniques	CO3
	Unit 4	**Image Segmentation**	
	A	Boundary detection based techniques, Point, line detection, Edge detection, Edge linking, local processing, regional processing, Hough transform	CO4,CO6
	B	Thresholding, Global Threshloding, adaptive thresholding, Iterative thresholding, Otsu's method, Moving averages, Multivariable thresholding	CO4,CO6
	C	Region based segmentation, Watershed algorithm, Use of motion in segmentation	CO4,CO6
	Unit 5	**Morphological Image Processing**	
	A	Basics, Erosion, Dilation, Opening, Closing, Hit-or-Miss Transform	CO5 ,CO6
	B	Morphological Algorithms: Boundary Detection, Hole filling, Connected components, convex hull, thinning, thickening, skeletons, pruning	CO5,CO6
	C	Geodesic Dilation, Erosion, Reconstruction by dilation and erosion. Applications of Morphological Image Processing	CO5,CO6
	Mode of examination	Theory	
	Weightage Distribution	***CA*** / ***MTE*** / ***ETE***	
		30% / 20% / 50%	
	Text Books	1. Digital Image Processing 2nd Edition, Rafael C. Gonzalvez and Richard E. Woods. Published by: Pearson Education.	
	Reference Books	1. Digital Image Processing and Computer Vision, R.J. Schalkoff. Published by: John Wiley and Sons, NY. 2. Fundamentals of Digital Image Processing, A.K. Jain. Published by Prentice Hall, Upper Saddle River, NJ. 3. Image Processing, Analysis and Machine Vision , by Milan Sonka ,Vaclav Hlavac , Roger Boyle Cengage Learning 3rd Edition 4. Digital Image Processing, by S Jayaraman, S Esakkirajan, T Veerakumar TMH Publication	
	Online Materials	1. https://nptel.ac.in/courses/106105032/ 2. http://users.rowan.edu/~polikar/WTtutorial.html	

CO and PO Mapping

S. No.	Course Outcome (CO)	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1	Define the fundamental concepts of a digital image processing system.	PO1,PO2,PO3,PO5,PO8,PSO1,PSO2
2	Classify images in the frequency domain using various transformations.	PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PSO1,PSO2
3	Apply various operations for image enhancement and image restoration.	PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PO12,PSO1,PSO2
4	Analyse image segmentation and various representation techniques.	PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PO12,PSO1,PSO2
5	Choose various morphological operations for Digital Image processing.	PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PO12,PSO1,PSO2
6	Discuss and Build various image processing techniques for real life applications.	PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PO12,PSO1,PSO2

CO-PO and PSO Mappings of Digital Image Processing CSE031

Subject	PO's / PSO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
Digital Image Processing CSE031	CO1	3	3	3	3	1	1	1	1	1	2	1	3	2	3	1
	CO2	3	3	3	3	2	1	1	1	1	2	1	3	2	3	2
	CO3	3	3	3	3	2	1	1	1	1	2	1	3	3	3	2
	CO4	3	3	3	3	2	2	1	1	1	2	1	3	3	3	2
	CO5	3	3	3	3	2	2	1	1	1	2	1	3	3	3	2
	CO6	3	3	3	3	2	3	3	1	3	2	1	3	3	3	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSA031	Digital Image Processing	3.00	3.00	3.00	3.00	1.83	1.67	1.33	1.00	1.33	2.00	1.00	3.00	2.67	3.00	2.00

Total- 32.83

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

School:		**School of Engineering and technology**			
Department		**Department of Computer Science and Engineering**			
Program:		**B. Tech**			
Branch:					
1	Course Code	CSE032			
2	Course Title	Cryptography and Network Security			
3	Credits	3			
4	Contact Hours (L-T-P)	3-0-0			
	Course Status	Core			
5	Course Objective	The objective of this course is to provide an intention to explain basic concepts and algorithms of symmetric &asymmetric key cryptography, including encryption/decryption and key exchange with the application of cryptography and technique.			
6	Course Outcomes	On successful completion of this module students will be able to: CO1: Identify the basic concepts of computer security, algorithms of symmetric Key cryptography, including encryption/decryption. CO2: Apply the tools and methodologies used to perform mathematic concepts behind the cryptographic algorithms.. CO3: Explain the tools and methodologies used to perform Security analysis. CO4: Interpret use of cryptographic data integrity algorithms and user authentication protocols CO5: Examine security at application layer, transport layer and network layer. CO6: Compare various algorithm of cryptography used for Network Security.			
7	Course Description	This course will provide a deterministic approach of both the principles and practice of cryptography & network security. It covers the basic issues to be addressed by a network security capability, and explored by providing a tutorial and survey of cryptography and network security technology.			
8	Outline syllabus				CO Mapping
	Unit 1	**Introduction& symmetric Key Cryptography**			
	A	Computer Security Concepts- OSI security Architecture, Security attacks, Services, mechanism, model of network security			CO1

	B	Classical encryption techniques- Substitution Cipher(Mono-alphabetic, Poly-alphabetic), Transposition cipher, Stegnography	CO1
	C	Block Cipher- Encryption Principles, DES and its variants, strength of DES	CO1
	Unit 2	**Mathematics of Cryptography**	
	A	Eucledian, Extended Eucledian Algorithm, EuilersTotient Function , Ferment little Theorem, Eulers theorem	CO2
	B	Primality Testing-Miller Rabin test, Chinese Remainder Theorem	CO2, CO6
	C	Exponential- square and multiply method, Discrete Logarithm	CO2, CO6
	Unit 3	**Asymmetric Cryptography & Key Exchange**	
	A	Public Key cryptography-RSA, Cryptanalysis of RSA	CO3
	B	Elgamal cryptography, Elliptic Curve cryptography	CO3, CO6
	C	Key Management and distribution : KDC, Diffie Hellman Key Exchange	CO3, CO6
	Unit 4	**Digital signatures**	
	A	User Authentication protocol- Kerberos	CO4
	B	Digital Signature –RSA, Elgamal, DSS	CO4
	C	Data integrity algorithms-Hash Functions, MD5, SHA-512	CO4
	Unit 5	**Security**	
	A	Security at Application layer-Email Architecture, S/MIME, PGP-Scenarios, key rings	CO5
	B	Security at Transport layer-SSL(Services, Protocols)	CO5
	C	Security at Network layer-IPSec(Modes, Security Protocols-AH, ESP, Services provided by IPSEC)	CO6
	Mode of examination	Theory/Jury/Practical/Viva	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	1. Atul Kahate , "Network Security ", Wiley India Pvt Ltd, 2010. 2. Michael T. Simpson, "Hands-on Cryptography & Network Security & Network Defense", Course Technology, 2010. 3. Rajat Khare, "Network Seuciryt and Cryptography & Network Security ", Luniver Press, 2006.	
	Other References	1. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc, 2001. 2. Behrouz A. Forouzan, “Cryptography And Network Security”- McGraw Hill 1. Internet as a resource for reference.	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Identifybasic concepts of computer security, algorithms of symmetric Key cryptography, including encryption/decryption.	PO1, PO2, PSO1. PSO2
2.	CO2: Apply the tools and methodologies used to perform mathematic concepts behind the cryptographic algorithms..	PO1,PO2,PO3, PO4, PSO1,PSO2
3.	CO3: Explain the tools and methodologies used to perform Security analysis.	PO1, PO3, PO5, PSO1, PSO2
4.	CO4: Analyze and use cryptographic data integrity algorithms and user authentication protocols	PO1, PO4, PO6, PO7, PSO1,PSO2
5.	CO5. Examine security at application layer, transport layer and network layer.	PO5,PO7, PO8, PO9, PSO1,PSO2
6.	CO6: Compare various algorithm of cryptography used for Network Security.	PO10,PO11,PO12,PSO1,PSO3

PO and PSO mapping with level of strength for Course Name Cryptography and Network Security **(Course Code CSE032)**

Code_ Course Name	CO's	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CSE032_Cryptography and Network Security	CO1	3	2		-	-	-	-	-	-	-	-	-	3	1	-
	CO2	2	3	2	1	-	-	-	-	-	-	-	-	2	3	-
	CO3	2	-	2	-	3	-	-	-	-	-	-	-	2	2	1
	CO4	2	-	-	2	-	2	2	-	-	-	-	-	2	2	
	CO5	-	-	-	-	2	-	2	2	2		-	-	1	-	-
	CO6	-	-	-	-	-	-	-	-	-	2	2	2	2	-	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO 3	PO 4	PO 5	P O6	P O 7	PO 8	PO 9	PO 10	P O 11	PO 12	PS O1	PS O2	PS O3
CSE032	Cryptography and Network Security y and Network Security	2.5	2.5	2	1.5	2.5	2	2	2	2	2	2	2	2	2	1.5

Strength of Correlation

1. Addressed to***Slight (Low=1) extent*** ***2.*** Addressed to***Moderate (Medium=2) extent***
3. Addressed to***Substantial (High=3) extent***

Syllabus: CSE041 SOFTWARE PROJECT MANAGEMENT

School:		**School of Engineering and technology**			
Department		**Department of Computer Science and Engineering**			
Program:		**B.Tech**			
Branch:		**Computer Science and Engineering**			
1	Course Code	CSE041			
2	Course Title	SOFTWARE PROJECT MANAGEMENT			
3	Credits	3			
4	Contact Hours (L-T-P)	3	0	0	
	Course Status	Core /Elective/Open Elective			
5	Course Objective	To provide fundamental skills of software Project management emphasizing on issues & hurdles associated with delivering successful projects. Apply project management concepts through working in a group as team leader or active team member on an IT project.			
6	Course Outcomes (6)	After successful completion of this course students should be able to: CO1: Define the Project Management principles while developing software. CO2: Explain different project scheduling techniques. CO3: Apply various project monitoring,control and review techniques CO4: Categorize various activities and estimate the risks involved in various project activities. CO5: Assess project quality and issues related to contract management. CO6: Discuss the impact of project planning on the performance of the organizations			
7	Course Description	This course is aimed at introducing the primary important concepts of project management related to managing software development projects. Students will also get familiar with the different activities involved in Software Project Management. Further, they will also come to know how to successfully plan and implement a software project management activity, and to complete a specific project in time with the available budget.			
8	Outline syllabus				CO Mapping
	Unit 1	**Introduction to Software Project Planning**			
	A	Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope Document, Project Management Cycle, SPM Objectives			CO1
	B	SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of Project Plan, Structure of a Software Project Management Plan			CO1
	C	Software Project Estimation, Estimation Methods, Estimation Models, Decision Process			CO1
	Unit 2	**Project Organization and Scheduling Project Elements**			
	A	Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle			CO2
	B	Ways to Organize Personnel, Project Schedule, Scheduling Objectives, Building the Project Schedule, Scheduling Terminology and Techniques			CO2
	C	Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts			CO2

	Unit 3	**Project Monitoring and Control**			
	A	Dimensions of Project Monitoring & Control, Earned Value Analysis			CO3, CO6
	B	Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI)			CO3
	C	Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews			CO3
	Unit 4	**Project Management Tools**			
	A	Software Configuration Items and Tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control			CO4
	B	Risk Management: Risks and Risk Types, Risk Breakdown Structure (RBS), Risk Management Process: Risk Identification, Risk Analysis, Risk Planning, Risk Monitoring			CO4, CO6
	C	Cost Benefit Analysis, Software Project Management Tools: CASE Tools, MS-Project			CO4, CO6
	Unit 5	**Software Quality and Staffing in Project Management**			
	A	Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model (CMM)			CO5, CO6
	B	SQA Activities, Formal SQA Approaches: Proof of Correctness, Statistical Quality Assurance, Product versus process quality management,			CO5
	C	Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance			CO5, CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Cottrell M. and Hughes B., "Software Project Management", 5th Edition, The McGraw-Hill Companies. 2. Walker Royce: —Software Project Management- Addison-Wesley, 1998			
	Other References	1. Pankaj Jalote, "Software Project Management in practice", 1st Edition, Pearson Education, 2005. 2. Kathy Schwalbe, "Information Technology Project Management" International Student Ed. THOMSON Course Technology			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Define the Project Management principles while developing software.	PO1,PO3,PO5,PO9,PO10, PO11,PO12,PSO3
2.	CO2: Explain different project scheduling techniques.	PO1,PO3,PO5,PO9,PO10, PO11,PO12,PSO3
3.	CO3: Apply various project monitoring, control and review techniques	PO1,PO3,PO5,PO8,PO9, PO10,PO11,PO12,PSO3
4.	CO4: Categorize various activities and estimate the risks involved in various project activities.	PO1,PO3,PO5,PO8,PO9, PO10,PO11,PO12,PSO3
5.	CO5: Assess project quality and issues related to contract management.	PO1,PO3,PO5,PO6,PO8,PO9, PO10,PO11,PO12,PSO3
6.	CO6: Discuss the impact of project planning on the	PO1,PO3,PO4,PO5,PO6,PO8,PO9,

	performance of the organizations	PO10,PO11,PO12,PSO3

PO and PSO mapping with level of strength for Software Project management (Course code CSE 041)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE041_ Software Project Management	CO1	3	-	1	-	1	-	-	-	3	2	3	2	-	-	2
	CO2	2	-	2	-	2	-	-	-	3	3	3	3	-	-	2
	CO3	2	-	3	-	2	-	-	1	3	2	3	3	-	-	3
	CO4	2	-	2	-	2	-	-	1	3	2	3	3	-	-	3
	CO5	1	-	3	-	2	3	-	1	3	3	3	3	-	-	3
	CO6	2	-	3	3	2	2	-	1	3	3	3	2	-	-	2

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE041	Software Project Management	2	-	2.3	3	1.8	2.5	-	1	3	2.5	3	2.6	-	-	2.5

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

CSE042 SOFTWARE TESTING

School:		**SET**			
Program:		**B.Tech**			
Branch:		**CSE**			
1	Course Code	CSE042			
2	Course Title	SOFTWARE TESTING			
3	Credits	3			
4	Contact Hours (L-T-P)	3	0	0	
	Course Status	Core /Elective/Open Elective (Drop Down)			
5	Course Objective	The primary objective of this course is to introduce and instruct software testing and Quality assurance concepts, strategies, and techniques in order to develop a total understanding of the testing process and how it impacts the software project.			
6	Course Outcomes (5-6)	On successful completion of this module students will be able to CO1: Define Basic concepts of Testing and Debugging CO2: Make use of Control flow graph to perform white box testing CO3: Apply Data flow and integration testing to develop feasible software CO4: Classify techniques of Functional testing and design test cases CO5: Evaluate the software quality using Reviews, maturity models and ISO standards. CO6: Adapt software testing methods and modern software testing tools for their testing projects.			
7	Course Description	This course will examine fundamental software testing and related program analysis techniques. In particular, the important phases of testing will be reviewed, emphasizing the significance of each phase when testing different types of software. The course will also include concepts such as test generation, test oracles, test coverage, regression testing, mutation testing, program analysis (e.g., program-flow and data-flow analysis), and test prioritization.			
8	Outline syllabus				CO Mapping
	Unit 1	Introduction			
	A	Human and errors, Testing Objectives, Principles of Testing, Behaviour and Correctness, verification and validation, Debugging and its techniques			CO1
	B	Software metrics, Software Testing Life Cycle, Testing activities , Test Levels,			CO1
	C	Testing exit criteria, Bug defect life cycle, White Box and Black Box Testing, test planning and design			CO1
	Unit 2	Unit and Control Flow Testing			
	A	Concept of Unit Testing, Static Unit Testing, Defect Prevention, Dynamic Unit Testing, Mutation Testing			CO2,CO6
	B	Control Flow Testing: Overview of Control Flow Testing, Control Flow Graph, Paths in a Control Flow Graph			CO2,CO6
	C	Cyclomatic complexity, Path Selection Criteria, Generating			CO2,CO6

		test input			
	Unit 3	Data Flow & Performance testing			
	A	Data Flow Anomaly, Overview of Dynamic Data Flow Testing, Data Flow Graph, Data Flow Terms			CO3,CO6
	B	Data Flow Testing Criteria, Comparison of Data Flow Test Selection Criteria, Feasible Paths and Test Selection Criteria			CO3,CO6
	C	Integration Testing: Introduction, Integration Techniques, Regression testing, Performance testing: Stress, Load, Volume, Soak and Spike, Overview of performance tools: Jmeter, Loadrunner, WebLoad			CO3,CO6
	Unit 4	Functional Testing			
	A	Equivalence Class Partitioning, Boundary Value Analysis, Decision Tables, Random Testing: Monkeys & Gorillas, Error Guessing			CO4,CO6
	B	Test case designing – Test cases, Test case format, Test case designing, Acceptance testing and criteria			CO4,CO6
	C	Automation testing**:** Need for automation, categorization of Testing tools, Selection of testing tools, Guidelines for automated testing, Overview of commercial testing tools			CO4,CO6
	Unit 5	**Reviews and Quality Control**			
	A	Testing maturity model, Test metrics and measurements – project, progress and productivity metrics – Status Meetings – Reports and Control Issues – Criteria for Test Completion			CO5,CO6
	B	Types of reviews – Developing a review program – Components of Review Plans– Reporting Review Results			CO5,CO6
	C	Five Views of Software Quality, McCall's Quality Factors and Criteria, ISO 9000:2000 Software Quality Standard, evaluating software quality			CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Sagar Naik & Piyu Tripathy, "Software Testing and Quality Assurance: Theory and Practice", Wiley.			
	Other References	1. Naresh Chauhan, "Software Testing : Principles and practices", Oxford university press 2. Boris Beizer, "Software Testing Techniques", Dreamtech Press 3. K.K. Aggrawal and Yogesh Singh, " Software Engineering" New Age International Publication			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Define Basic concepts of Testing and Debugging	PO1,PO2,PO10,PO12,PSO3
2.	CO2: Make use of Control flow graph to perform white box testing	PO1,PO2,PO3,PO4,PO5,PO6, PO8,PO9,PO10,PO12,PSO1,PSO3
3.	CO3: Apply Data flow and integration testing to develop feasible software	PO1,PO2,PO3,PO4,PO5,PO6, PO8,PO9,PO10,PO12,PSO1,PSO3
4.	CO4: Classify techniques of Functional testing and design test cases	PO1,PO2,PO3,PO4,PO5,PO6, PO8,PO9,PO10,PO12,PSO1,PSO3
5.	CO5: Evaluate the software quality using Reviews, maturity models and ISO standards.	PO1,PO2,PO3,PO4,PO5,PO6, PO8,PO9,PO10,PO12,PSO1,PSO3
	CO6: Adapt software testing methods and modern software testing tools for their testing projects.	PO1,PO2,PO3,PO4,PO5,PO6,PO7, PO8,PO9,PO10,PO11,PO12,PSO1,PSO3

PO and PSO mapping with level of strength for Software Testing (CSE 042)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO 3
CSE042_ Software Testing	CO1	2	1	-	-	-	-	-	-	-	3	-	2	-	-	3
	CO2	3	3	3	2	3	1	-	1	2	3	-	2	2	-	3
	CO3	3	3	3	2	2	2	-	1	2	3	-	2	2	-	3
	CO4	3	3	3	2	3	1	-	1	2	3	-	2	2	-	3
	CO5	3	3	2	2	2	2	-	1	2	3	-	2	2	-	3
	CO6	3	3	3	2	3	2	3	2	3	3	3	3	2	-	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE042	Software Testing	2.8	2.6	2.8	2	2.6	1.6	3	1.2	2.2	3	3	2.1	2	-	3

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

1	Course Code	**CSE051**	
2	Course Title	**Wireless Networks**	
3	Credits	3	
4	Contact Hours	**3-0-0**	
5	Course Objective	The objective of this course is to provide fundamental knowledge about Wireless networks, protocol stack and standards, understand and analyze the network layer solutions for Wireless networks, and make student aware of 4G Services.	
6	Course Outcomes	After successful completion of this course students should be able to: CO1. Enumerate, identify the foundation, and describe properties and capabilities of commonly used wireless technologies CO2. Identify and describe the infrastructure and requirements of Mobile IP and Mobile IPv6 CO3.Illustrate the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer CO4. Demonstrate the typical mobile networking infrastructure through a popular GSM protocol CO5. Identify and describe the structure of current 4G cellular networks. CO6.Compare applications of 4G technologies.	
7	**Course Description**	The course will describe concepts, technology and applications of wireless networking as used in current and next-generation wireless networks. In addition, the course addresses the fundamentals of wireless communications and provides an overview of existing and emerging wireless communication networks.	
8	**Course Contents**		
8.01	Unit A	**WIRELESS LAN**	**CO Mapping**
8.02	Unit A Topic 1	Introduction-WLAN technologies: Infrared, UHF narrowband, spread spectrum -IEEE802.11: System architecture, protocol architecture,	CO1
8.03	Unit A Topic 2	Physical layer, MAC layer, 802.11b, 802.11a – Hiper LAN: WATM, BRAN, HiperLAN2	CO1
8.04	Unit A Topic 3	Bluetooth: Architecture, Radio Layer, Baseband layer, Link manager Protocol, security - IEEE802.16-WIMAX: Physical layer, MAC, Spectrum allocation for WIMAX	CO1
8.05	Unit B	**MOBILE NETWORK LAYER**	
8.06	Unit B Topic 1	Introduction - Mobile IP: IP packet delivery, Agent discovery, tunneling and encapsulation,	CO1, CO2
8.07	Unit B Topic 2	IPV6-Network layer in the internet Mobile IP session initiation protocol	CO1, CO2
8.08	Unit B Topic 3	Mobile ad-hoc network: Routing Destination Sequence distance vector, Dynamic source routing.	CO1, CO2
8.09	Unit C	**MOBILE TRANSPORT LAYER**	
8.10	Unit C Topic 1	TCP enhancements for wireless protocols - Traditional TCP: Congestion control, fast retransmit/fast recovery, Implications of mobility	CO3
8.11	Unit C Topic 2	Classical TCP improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing	CO3
8.12	Unit C Topic 3	Selective retransmission, Transaction oriented TCP - TCP over 3G wireless networks.	CO3
8.13	Unit D	**WIRELESS WIDE AREA NETWORK**	

8.14	Unit D Topic 1	Overview of UTMS Terrestrial Radio access network-UMTS Core network Architecture	CO3, CO4
8.15	Unit D Topic 2	3G-MSC, 3G-SGSN, 3G-GGSN, SMS-GMSC/SMS-IWMSC, Firewall,	CO3, CO4
8.16	Unit D Topic 3	DNS/DHCP-High speed Downlink packet access (HSDPA)- LTE network architecture and protocol.	CO3, CO4
8.17	Unit E	**4G NETWORKS**	
8.18	Unit E Topic 1	Introduction – 4G vision – 4G features and challenges - Applications of 4G – 4G Technologies	CO5, CO6
8.19	Unit E Topic 2	Multicarrier Modulation, Smart antenna techniques, OFDM-MIMO systems,	CO5, CO6
8.20	Unit E Topic 3	Adaptive Modulation and coding with time slot scheduler, Cognitive Radio.	CO5, CO6
10	**Reading Content**		
9.1	Text book*	1. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education 2012.(Unit I,II,III)	
9.2	other references	1. Erik Dahlman, Stefan Parkvall, Johan Skold and Per Beming, "3G Evolution HSPA and LTE for Mobile Broadband", Second Edition, Academic Press, 2008. 2.Anurag Kumar, D.Manjunath, Joy kuri, "Wireless Networking", First Edition, Elsevier 2011. 3.Simon Haykin , Michael Moher, David Koilpillai, "Modern Wireless Communications", First Edition, Pearson Education 2013	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Enumerate, identify the foundation, and describe properties and capabilities of commonly used wireless technologies	PO1,PO3,PO8 PSO3
2.	CO2. Identify and describe the infrastructure and requirements of Mobile IP and Mobile IPv6	PO1,PO2,PO3,PO8 PSO3
3.	CO3.Illustrate the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer	PO1,PO2,PO3,PO8 PSO3
4.	CO4. Demonstrate the typical mobile networking infrastructure through a popular GSM protocol	PO1,PO2,PO3,PO8 PSO3
5	CO5. Identify and describe the structure of current 4G cellular networks.	PO1,PO2,PO3,PO4,PO5,PO8 PSO3
6.	CO6.Compare applications of 4G technologies.	PO1,PO2,PO3,PO4,PO5,PO8 PSO3

PO and PSO mapping with level of strength for Course Name Wireless Networks (CSE051)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	3	-	3	-	-	-	-	1	-	-	-	-	-	-	2
CO2	3	2	3	-	-	-	-	1	-	-	-	-	-	-	2
CO3	3	2	3	-	-	-	-	1	-	-	-	-	-	-	2

	CO4	3	2	3	-	-	-	-	1	-	-	-	-	-	-	2
	CO5	3	2	3	2	2	-	-	1	-	-	-	-	-	-	3
	CO6	3	2	3	2	2	-	-	1	-	-	-	-	-	-	3
	Avg.	3	1.6	3	0.6	0.6	-	-	1	-	-	-	-	-	-	2.3

School:		**School of Engineering and technology**		
Department		**Department of Computer Science and Engineering**		
Program:		**B. tech**		
Branch: CSE		**Semester:**		
1	Course Code	CSE052		
2	Course Title	**Risk Management**		
3	Credits	3		
4	Contact Hours (L-T-P)	3-0-0		
	Course Status	Core /Elective/Open Elective		
5	Course Objective	The objective of this course is to provide an insight to fundamentals of risk management in which business and society make an assessment of, control, regulation of risk management and transfer risk.		
6	Course Outcomes	On successful completion of this module students will be able to: CO1: define the basic concept of risk, types, uncertainty, managing, evaluation and prediction of risk. CO2: illustrate the key stages, component, framework, standards, architecture, strategy policies, and protocols process of the risk management. CO3: identify various risk, score them, control and opportunity risk CO4: apply approach/technique of risk assessment for strategy, projects and operations, and make use of risk matrix CO5: analyze uncertainty and risk in projects and apply measurement CO6: Explain, compare and apply risk management concept and techniques in projects to the success of the organization.		
7	Course Description	This course is to provide students with the concepts and fundamentals of risk management, a study of risk assessment and management techniques, methods, and models used in industry to minimize, control and communicate risks.		
8	Outline syllabus			CO Mapping
	Unit 1	**Introduction**		
	A	The Concept of Risk, Risk and Uncertainty: Distinction, Classification of Risks		CO1, CO6
	B	Managing Risk, Sources and Measurement of Risk		CO1, CO6
	C	Risk Evaluation and Prediction, Types of Risk		CO1, CO6
	Unit 2	**Principles and aims of risk management**		
	A	Principles of risk management, Importance of risk management, Risk management activities, Perspectives of risk management		CO2, CO6
	B	Scope of risk management standards:- Risk management process, Risk management framework		CO2, CO6
	C	Risk architecture, strategy Policies and protocols		CO2, CO6

	Unit 3	**Risk classification Systems**			
	A	Shor, Medium and long term Risk			CO3, CO6
	B	FIRM risk scorecard, PESTLE risk classification system			CO3, CO6
	C	Hazard, control and opportunity risk			CO3, CO6
	Unit 4	**Risk Assessment**			
	A	Importance of risk assessment, Approaches to risk assessment, risk assessment techniques			CO4, CO6
	B	Risk Matrix, Risk Perception, Risk appetite			CO4, CO6
	C	Application of risk matrix, inherent and current level of risk, 4T's of risk response			CO4, CO6
	Unit 5	**Risk Management**			
	A	Importance of risk appetite – Risk tolerance, treatment, termination			CO5, CO6
	B	Introduction to Project Risk Management, uncertainty in projects , project lifecycle, Project risk analysis and management			CO5, CO6
	C	Operational risk management- definition, measurement, difficulties of measurement			CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Paul Hopkin,"Fundamental of Risk Management- Understanding evaluating and implementing effective risk management", KoganPage London Philadelphia New Delhi.			
	Other References	1. Internet			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: define the basic concept of risk, types, uncertainty, managing, evaluation and prediction of risk.	PO1, PO2, PO7, P12, PSO1
2.	CO2: illustrate the key stages, component, framework, standards, architecture, strategy policies, and protocols process of the risk management.	PO1, PO4, PO5, PO8, PO9, PO10, PO11, PO12 PSO3
3.	CO3: identify various risk, score them, control and	PO1, PO2, PO4, PO9,

	opportunity risk	P12, PSO1
4.	CO4: apply approach/technique of risk assessment for strategy, projects and operations, and make use of risk matrix	PO1, PO3, PO5, PO6, PO9, P11, PSO3
5.	CO5: analyze uncertainty and risk in projects and apply measurement	PO1, PO2, PO4, PO5, PO7, PO9, PSO3
6.	CO6: explain, compare and apply risk management concept and techniques in projects to the success of the organization.	PO1, PO3, PO5, PO7, PO9, P11, P12, PSO2

PO and PSO mapping with level of strength for Course Name Risk Management (Course Code CSE052)

	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CSE052 _ Risk Management	CO1	3	-	-	-	-	-	1	-	-	-	-	1	2	-	-
	CO2	2	2	-	3	2	-	-	1	2	1	1	1	-	-	2
	CO3	2	-	-	-	-	-	-	-	2	-	-	1	1	-	-
	CO4	1	-	2	-	3	-	-	-	2	2	2	-	-	-	1
	CO5	2	2	-	2	1	-	1	-	2	1	1	-	-	-	1
	CO6	2	2	2	-	-	-	1	-	2	1	1	1	-	1	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE052	Risk Management	2	2	2	2.5	2	-	1	1	2	1.25	1.25	1	1.5	1	1.33

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

2.1 Template A1: Syllabus for Theory Courses (SAMPLE)

School:		**School of Engineering and technology**		
Department		**Department of Computer Science and Engineering**		
Program:				
Branch:				
1	Course Code	CSE022		
2	Course Title	Android Application Development		
3	Credits	3		
4	Contact Hours (L-T-P)	3-0-0		
	Course Status	Core /Elective/Open Elective		
5	Course Objective	1. Basics of Android OS 2. Develop Basic and advance Android Apps 3. Publishing and Monetizing the app		
6	Course Outcomes	CO1: Demonstrate and understanding anatomy of an android application. CO2: Develop various android applications related to layouts and rich uses interactive interfaces. CO3:Apply essential android programming concept CO4: Distinguish and compare different components of Android CO5: Access and work with databases under an android operating system. CO6: Develop Basic and advance android app development for android devices.		
7	Course Description	This android development course will help students to Understand the basis of Android Platform and its lifecycle. This will help them to implement simple GUI applications, use built-in components and work with database to store the data.		
8	Outline syllabus			CO Mapping
	Unit 1	**Introduction and Architecture of Android**		
	A	History of Android, Features of Android, Android Devices, Open Handset Alliance (OHA) , Advantages of Android, Comparing Android with other platform		CO1
	B	Android Directory Structure, Android Development Tools, Architecture of Android.		CO1
	C	Structure of Manifest files, Activities, Activity life cycle		CO1
	Unit 2	**User Interfaces**		
	A	Layouts-Linear layout, Relative layout, Constraint layout		CO1,CO2
	B	Input Controls – Text input, Checkboxes, Radio buttons, Spinner, Toggle buttons and switches		CO1,CO2
	C	Menus- Popup, Dialog, Context, date picker, style		CO1,CO2

	Unit 3	**Components of Android**			
	A	Intents, types of intents, Intent Filter			CO3
	B	Starting a new activity, Sending and Receiving of data, Notifications			CO3
	C	Services, service life cycle, Broadcast receivers			CO3
	Unit 4	**Working with SQL Lite**			
	A	Introduction to SQLite database, Steps for connecting application with database.			CO4,CO5
	B	Fetch and update data in database from application,			CO4,CO5
	C	Cursor and content value, opening and closing database			CO4,CO5
	Unit 5	**Sensors and Animation**			
	A	Sensor Manager, Sensor Framework, Types of Sensors Accelerometer, Gyroscope, Proximity Sensor, Orientation, Light Sensor			CO6
	B	Detect availability of sensor, Fetch data from sensors on frequent basis, Development of compass application with help of gyroscope sensor			CO6
	C	SMS , Graphics and Animation			CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Anubhav Pradhan and Anil V. Deshpande , Composing Mobile Apps: Learn, Explore, Apply Using Android , 1st Edition,Wiley India.			
	Other References	1. Wei-Meng Lee , Beginning Android 4 Application Development. 2. Neil Smyth ,Android Studio Development essentials-Android 6			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Demonstrate and understanding anatomy of an android application.	PO5,PO9,PO12,PSO3
2.	CO2: Develop various android applications related to layouts and rich uses interactive interfaces.	PO5,PO9,PO12,PSO3
3.	CO3:Apply essential android programming concept	PO3,PO5,PO9,PO12,PSO1,PSO3
4.	CO4: Distinguish and compare	PO5,PO9,PO11,PO12,PSO3

	different components of Android	
5.	CO5: Access and work with databases under an android operating system.	PO3,PO4,PO5,PO7,PO9,PO11,PO12,PSO3
6.	CO6: Develop Basic and advance android app development for android devices	PO1,PO2,PO3,PO4,PO5,PO7,PO9,PO11,PO12,PSO1,PSO2,PSO3

PO and PSO mapping with level of strength for Course Name Android Application Development **(Course Code** CSE022**)**

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE 022_ Android Application Development	CO1					3				2			1			2
	CO2					3				2			1			2
	CO3			2		3				2			1	2		2
	CO4					3				2		2	1			2
	CO5			2	3	3		2		2		2	1			2
	CO6	1	2	3	3	3	3	3		3		3	1	3	3	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSE022	Android Application Development	1	2	2.3	3	3	3	2.5	0	2.2	0	2.3	1	2.5	3	2.2

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

2.1 Template A1: Syllabus for Theory Courses (SAMPLE)

School:		**School of Engineering and technology**			
Department		**Department of Computer Science and Engineering**			
Program:					
Branch:					
1	Course Code	CS022			
2	Course Title	Android Application Development			
3	Credits	1			
4	Contact Hours (L-T-P)	0-0-2			
	Course Status	Core /Elective/Open Elective			
5	Course Objective	4. Basics of Android OS 5. Develop Basic and advance Android Apps 6. Publishing and Monetizing the app			
6	Course Outcomes	CO1: Demonstrate and understanding anatomy of an android application. CO2: Develop various android applications related to layouts and rich uses interactive interfaces. CO3:Apply essential android programming concept CO4: Distinguish and compare different components of Android CO5: Access and work with databases under an android operating system. CO6: Develop Basic and advance android app development for android devices.			
7	Course Description	This android development course will help students to Understand the basis of Android Platform and its lifecycle. This will help them to implement simple GUI applications, use built-in components and work with database to store the data.			
8	Outline syllabus				CO Mapping
	Unit 1	**Introduction and Architecture of Android**			
	A	Basic program to study the directory structure of android			CO1
	Unit 2	**User Interfaces**			
	A	Programs to develop UI for android app			CO1,CO2
	Unit 3	**Components of Android**			
	A	Program using different component of android			CO3
	Unit 4	**Working with SQL Lite**			
	A	Program used to store and retrieve data from database			CO4,CO5
	Unit 5	**Sensors and Animation**			
	A	Program based on sensor and animation			CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage	CA	MTE	ETE	

	Distribution	60%	0%	40%	
	Text book/s*	1. Anubhav Pradhan and Anil V. Deshpande , Composing Mobile Apps: Learn, Explore, Apply Using Android , 1st Edition,Wiley India.			
	Other References	1. Wei-Meng Lee , Beginning Android 4 Application Development. 2. Neil Smyth ,Android Studio Development essentials-Android 6			

PO and PSO mapping with level of strength for Course Name Android Application Development **(Course Code** CSP022**)**

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSP 022_ Android Application Development	CO1					3				2			1			2
	CO2					3				2			1			2
	CO3			2		3				2			1	2		2
	CO4					3				2		2	1			2
	CO5			2	3	3		2		2		2	1			2
	CO6	1	2	3	3	3	3	3		3		3	1	3	3	3

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSP022	Android Application Development	1	2	2.3	3	3	3	2.5	0	2.2	0	2.3	1	2.5	3	2.2

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

Syllabus: CSP 396, Technical Skill Enhancement Course-2(Application Development Lab)

School: SET		**Batch: 2019-2023**	
Program: BTech		**Current Academic Year: 2019-2020**	
Branch:		**Semester:6**	
1	Course Code	CSP396	
2	Course Title	Technical Skill Enhancement Course-2(Application Development Lab)	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory/Elective	
5	Course Objective	Describe the components and structure of a mobile development frameworks (Android SDK and Eclipse Android Development Tools (ADT)) and learn how and when to apply the different components to develop a working system.	
6	Course Outcomes	On successful completion of the course, the student will be able to: **CO1:**Explainthe fundamentals of Android App Development. **CO2:**Make use of UI components to create Android applications. **CO3:**Examine the services and notifications in android to perform event driven programming. **CO4:**Develop database SQLite based Android applications. **CO5:**Analyze the usage of commonly available device sensors while building Android App. **CO6:**Develop application using Android software development tools.	
7	Course Description	The course will introduce concepts of the Android platform, Android application components, Activities and their lifecycle, UI design. It will also help students to build applications according to their problem statements.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to Android**	
		Configuration of android SDK and test run of application on device, Create “Hello World” application, develop an Android Application to implement Activity life cycle.	CO1,CO6
	Unit 2	**Android UI Components**	
		Create a layout of Calculator using Grid layout, develop an Android Application to implement event listener on above layout, develop an Android Application to implement implicit intent.	CO1,CO2, ,CO6
	Unit 3	**Services and Notification**	
		Develop an Android Application to implement Service life cycle, Develop an Android Application to implement status bar notification, Create a menu with 5 options and selected option should appear in text box	CO3, ,CO6
	Unit 4	**Working with SQL Lite**	
		Create and Login applicationfor above mentioned problems, Create an application to implement Create, Insert and update operation on the database, Create an application to perform Delete and retrieve operation on the database.	CO4, ,CO6

	Unit 5	**Sensor Device**			
		Develop an Android Application to detect availability of all sensors, Develop an Android Application to Fetch data from sensors, Develop an Android Application for development of compass application with help of Orientation sensor			CO5, ,CO6
	Mode of examination	Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	1. AnubhavPradhan and Anil V. Deshpande , Composing Mobile Apps: Learn, Explore, Apply Using Android , 1st Edition, Wiley India.			
	Other References	1. Wei-MengLee , Beginning Android 4 Application Development. 2. Neil Smyth ,Android Studio Development essentials-Android 6			

CO and PO Mapping

Mapping between Cos and Pos, PSO's		
Sl. No.	**Course Outcomes (COs)**	**Mapped Program Outcomes and PSO's**
1	**CO1:** Explain the fundamentals of Android App Development.	**PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3**
2	**CO2:** Make use of UI components to create Android applications.	**PO1,PO3,PO5,PO10,PO12,PSO1,PSO2,PSO3**
3	**CO3:** Examine the services and notifications in android to perform event driven programming.	**PO1,PO2,PO3,PO5,PO12,PSO1,PSO2,PSO3**
4	**CO4:** Develop database SQLite based Android applications.	**PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3**
5	**CO5:** Analyze the usage of commonly available device sensors while building Android App.	**PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3**
6	**CO6:** Develop application using Android software development tools.	**PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO9,PO10,PO11,PO12,PSO1,PSO2,PSO3**

PO and PSO mapping with level of strength for Course Name Technical Skill Enhancement Course-2 (Course Code CSP 396)

COs	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO 10	PO1 1	PO 12	PSO 1	PSO2	PSO3
CO1	1	-	1	-	2	-	-	-	-	-	-	1	1	2	1
CO2	1	-	1	-	2	-	-	-	-	2	-	1	1	2	1
CO3	1	2	1	-	2	-	-	-	-	-	-	1	1	2	1
CO4	1	-	2	-	2	-	-	-	-	-	-	1	1	2	1
CO5	2	-	1	-	2	-	-	-	-	-	-	1	1	2	1
CO6	2	2	3	2	2	2	1	-	2	3	2	2	2	3	1
Avg PO attained	1	0.7	1.5	0.3	2	0.3	0.2	0	0	1	0	1	1	2.2	1

Branch: CSE / IT		Semester: 6th	
1	Course Code	**CSP398** Course Name: Project Based Learning -4	
2	Course Title	Project Based Learning -4	
3	Credits	2	
4	Contact Hours (L-T-P)	0-0-4	
	Course Status	Compulsory	
5	Course Objective	16. To align student's skill and interests with a realistic problem or project. 17. To understand the significance of problem and its scope. 18. Students will make decisions within a framework.	
6	Course Outcomes	Students will be able to: CO1: Identify and formulate problem statement. CO2: Design relational database schema. CO3: Develop the solution by using different aspects of programming language. CO4: Classify and understand various test techniques for verification and validation of project. CO5: Analyze and make use of modern for solving real word problems. CO6: Develop teamwork and need to engage in life-long learning, along with the ability to communicate effectively with others.	
7	Course Description	In PBL-4, the students will learn how to define the problem for developing projects, and Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.	
8	Outline syllabus		CO Mapping
	Unit 1	Problem Definition and identification, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any.	CO1,CO4
	Unit 2	Use of the relational algebra operations from mathematical set theory (union, intersection, difference, and Cartesian product) and the relational algebra operations developed specifically for relational databases (select (restrict), project, join, and division)..	CO2,CO6
	Unit 3	Design; implement project work in any programming language.	CO3
	Unit 4	Use of various test tools and techniques for software verification and validation of project	CO4,CO5
	Unit 5	Demonstrate and execute Project with the team.	CO6
		Report should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, ER diagrams, Use Case Diagrams, State Diagrams, Sequence Diagrams, Communication Diagrams, and Activity Diagrams, Implementation Detail. Validation Reports.	

		References, Test cases if any. The presentation, report, work done during the term supported by the documentation, forms the basis of assessment.			
	Mode of examination	Practical /Viva			
	Weight age Distribution	CA			MTE
		60%	NA	ETE	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1: Identify and formulate problem statement.	PO1, PO2, PO4,PO6, PO8,PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
2.	CO2: Design relational database schema.	PO1, PO2, PO3,PO4,PO5, PO7, PO8, PO9, PO11, PO12 , PSO1,PSO2,PSO3
3.	CO3: Develop the solution by using different aspects of programming language.	PO1, PO2, PO3,PO4,PO5, PO6, PO8, PO9, PO11, PO12, PSO1,PSO2
4.	CO4: Classify and understand various test techniques for verification and validation of project.	PO1, PO2, PO3,PO4,PO5, PO8,PO9, PO10, PO11, PO12 ,PSO1,PSO2,PSO3
5.	CO5: Analyze and make use of modern for solving real word problems.	PO1, PO2, PO5, PO6, PO7, PO8, PO9, PO12 PSO1,PSO2
6.	CO6: Develop teamwork and need to engage in life-long learning, along with the ability to communicate effectively with others.	PO2, PO4, PO8,PO9, PO10, PO11, PO12,PSO1,PSO3

PO and PSO mapping with level of strength for Course Name Project Based Learning – 4 (Course Code CSP398)

CO/PO Mapping (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low															
Cos	Programme Outcomes(POs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	-	2	-	1	-	1	2	-	2	1	2	2	3
CO2	3	2	2	2	2	-	-	1	2	-	2	1	2	1	1
CO3	3	2	2	2	2	3	-	1	2	-	2	1	2	2	-
CO4	3	3	2	2	3	-	-	1	2	-	-	1	2	2	2
CO5	3	2	-	-	3	-	-	1	2	-	-	1	2	2	-
CO6	-	1	-	1	-	-	-	2	2	3	3	3	1	-	1
Avg PO attained	3	2.2	1	1.5	1.7	0.7	0	1.2	2	1	2	1	2	1.5	1.2

2.1 Template A1: Syllabus for Theory Subjects

School: SET		**Batch : 2016-2020**	
Program: B.Tech		**Current Academic Year: 2019**	
Branch: Mechanical Engineering		**Semester: III**	
1	Course Code	HMM305	
2	Course Title	Management for Engineers	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Compulsory	
5	Course Objective	The objective of this course is to expose the students to understand the basics of Management Foundations. The students will be given a detailed grounding for the theories and cases related to the general management. The aim of the course is to orient the students in theories and practices of Management so as to apply the acquired knowledge in actual business practices. This is a gateway to the real world of management and decision-making.	
6	Course Outcomes	CO1: Define basic principles and concepts related to management in an organization including the functions, different theories of management and roles they play in an organization. CO2: Explain the primary function Planning with its process. Also, how forecasting is done in organizations with various techniques are used. CO3: Use of organizing by studying different types of organization and also using decentralization and span of control in organizations. CO4: Analyse jobs, recruitment process, manpower planning, job rotation, trainings and rewards in various organizations. CO5: Measure motivation and management control concepts to obtain effective controlling in management system in organizations. CO6: Develop proper system in an organization by using all the functions of management.	
7	Course Description	This course gives an overview of engineering management and help to understand the various functions of management used in an organization. The focus of the course is the development of individual skills and team work.	
8	Outline syllabus		CO Mapping
	Unit 1	Introduction of Management & Organisation	CO1,CO6
	A	Management-Definition of Management & Organisation	CO1,CO6
	B	Concept, Nature, Scope and Functions of Management, Levels of Management, Management Theories - Taylors principle, Fayol's Principles, Hawthorne Studies, Systems Approach and Contingency Approach to Management.	CO1,CO6
	C	Mintzberg's Managerial Roles, Skills of Manager, Functions of management	CO1,CO6
	Unit 2	Management Planning Process	CO2,CO6
	A	Planning objectives and characteristics.	CO2,CO6

	B	Hierarchies of planning.			CO2, CO6
	C	The concept and techniques of forecasting.			CO2,CO6
	Unit 3	Organizing			C03,C06
	A	Meaning, Importance and Principles			C03,C06
	B	Departmentalization, Span of Control			CO3,CO6
	C	Types of Organization, Authority, Delegation of Authority			CO3,CO6
	Unit 4	Staffing			CO4,C06
	A	Meaning, Job analysis			CO4,C06
	B	Manpower planning, Recruitment, Transfers and Promotions			CO4, CO6
	C	Appraisals, Management Development, Job Rotation, Training, Rewards and Recognition,			CO4, CO6
	Unit 5	Directing & Controlling			CO5,CO6
	A	Motivation, Co-ordination, Communication,			CO5,CO6
	B	Directing and Management Control, Decision Making,			CO5,CO6
	C	Management by objectives (MBO) the concept and relevance. Objectives and Process of Management Control			CO5,CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. Principles & practice of Mgmt., L.M. Prasad			
	Other References	1. Management Today, Burton & Thakur 2. Principles & Practices of Mgmt., C.B. Gupta 3. Understanding Management, Richard L.Daft 4. Management, Stoner, Freemand & Gilbert 5. Essential of Management, Koontz O' Donnel			

1.3.5 Program Outcome Vs Courses Mapping Table:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO305.1	2	1	2	2	2	2	-	2	1	3	-	-	1	1	2
CO305.2	1	1	2	2	1	2	1	-	-	2	2	1	1	1	2
CO305.3	3	1	1	2	3	2	-	2	-	-	1	2	1	2	2
CO305.4	-	2	2	1	-	1	-	1	-	2	1	-	1	1	2
CO305.5	-	1	2	2	-	2	3	1	2	-	-	1	2	2	1
CO305.6	**1**	2	1	1	2	2	2	-	1	-	-	1	2	2	2
CO305															

1-Slight (Low)
2-Moderate (Medium)
3-Substantial (High)

Syllabus: CSE 053, Advanced Operating System

School: SET		**Batch : 2018-2022**	
Program: B.Tech		**Current Academic Year: 2018-19**	
Branch: CSE		**Semester: IV**	
1	Course Code	**CSE 053**	Course Name: Advanced Operating System
2	Course Title	Principles of Operating System	
3	Credits	3	
4	Contact Hours (L-T-P)	3-0-0	
	Course Status	Core	
5	Course Objective	5. This course introduces the challenges for designing the operating systems. 6. Includes different design principles and algorithms. 7. Evaluation of algorithms proposed. 8. Implementation of algorithms and utilities.	
6	Course Outcomes	Students will be able : **CO1** Discuss the various synchronization, scheduling and memory management issues **CO2** Demonstrate the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system **CO3** Discuss the various resource management techniques for distributed systems **CO4** Identify the different features of real time and mobile operating systems **CO5** Install and use available open source kernel **CO6** Modify existing open source kernels in terms of functionality or features used	
7	Course Description	This course covers general issues of design and implementation of advanced modern operating systems. The focus is on issues that are critical to the applications of distributed systems and computer networks, which include inter process communication, distributed processing, sharing and replication of data and files.	
8	Outline syllabus		CO Mapping
	Unit 1	**FUNDAMENTALS OF OPERATING SYSTEMS**	
	A	Overview – Synchronization Mechanisms – Processes and Threads - Process Scheduling	CO1
	B	Deadlocks: Detection, Prevention and Recovery	CO1
	C	Models of Resources – Memory Management Techniques.	CO1

	Unit 2	**DISTRIBUTED OPERATING SYSTEMS**	
	A	Issues in Distributed Operating System – Architecture – Communication Primitives –	CO1, CO2
	B	Lamport's Logical clocks – Causal Ordering of Messages	CO1, CO2
	C	Distributed Mutual Exclusion Algorithms – Centralized and Distributed Deadlock Detection Algorithms – Agreement Protocols.	CO1, CO2
	Unit 3	**DISTRIBUTED RESOURCE MANAGEMENT**	
	A	Distributed File Systems – Design Issues - Distributed Shared Memory – Algorithms for – Implementing Distributed Shared memory	CO1,CO2
	B	Issues in Load Distributing – Scheduling Algorithms – Synchronous and Asynchronous Check Pointing and Recovery	CO1,CO2,CO3,CO4
	C	Fault Tolerance – Two-Phase Commit Protocol – Non-blocking Commit Protocol – Security and Protection.	CO1,CO2,CO3,CO4
	Unit 4	**REAL TIME AND MOBILE OPERATING SYSTEMS**	
	A	Basic Model of Real Time Systems - Characteristics- Applications of Real Time Systems	CO1,CO2,CO3,CO5
	B	Real Time Task Scheduling - Handling Resource Sharing	CO1,CO2,CO3,CO5
	C	Mobile Operating Systems –Micro Kernel Design - Client Server Resource Access – Processes and Threads - Memory Management - File system.	CO1,CO2,CO3,CO5
	Unit 5	**CASE STUDIES**	
	A	linux System: Design Principles - Kernel Modules - Process Management Scheduling -	CO1,CO2,CO3,CO6
	B	Memory Management - Input-Output Management - File System	CO1,CO2,CO3,CO4,CO6
	C	Inter-process Communication. iOS and Android: Architecture and SDK Framework - Media Layer - Services Layer - Core OS Layer - File System.	CO1,CO2,CO3,CO6
	Mode of examination	Theory	
	Weightage Distribution	CA / MTE / ETE	
		30% / 20% / 50%	
	Text book/s*	Abraham Silberschatz; Peter Baer Galvin; Greg Gagne, "Operating System Concepts", Seventh Edition, John Wiley & Sons, 2004.	
	Other References	4. Mukesh Singhal and Niranjan G. Shivaratri, "Advanced Concepts in Operating Systems – Distributed, Database, and Multiprocessor Operating Systems", Tata McGraw-Hill, 2001. 5. Daniel P Bovet and Marco Cesati,	

		"Understanding the Linux kernel", 3rd edition, O'Reilly, 2005. 6. Rajib Mall, "Real-Time Systems: Theory and Practice", Pearson Education India, 2006.	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	**CO1** Discuss the various synchronization, scheduling and memory management issues	PO1,PO2,PO3,PO4,PSO1
2.	**CO2** Demonstrate the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system	PO1, PO3, PO4, PSO2
3.	**CO3** Discuss the various resource management techniques for distributed systems	PO1,PO2,PO3,PO4
4.	**CO4** Identify the different features of real time and mobile operating systems	PO9, PO10,PO11, PSO3
5.	**CO5** Install and use available open source kernel	PO1,PO2,PO8,PO9,PO10,PSO1
6.	**CO6** Modify existing open source kernels in terms of functionality or features used	PO1,PO2,PO10,PO11,PSO1,PSO2

PO and PSO mapping with level of strength for Course Name Principles of Operating System (Course Code CSE 053)

CSE053	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
	CO1	3	3	3	3	--	--	--	2	2	1	2	1	3	2	2
	CO2	3	2	3	3	--	--	--	2	2	2	1	1	2	3	2
	CO3	3	3	3	3	--	--	--	1	1	1	3	2	3	2	1
	CO4	2	2	2	2	1	--	--	2	3	3	3	1	2	2	2
	Co5	2	2	3	-	-	-	-	3	3	1	2	-	3	-	-
	CO6	3	2	-	-	-	-	-	-	-	2	3	-	2	2	-

TERM-VII

Syllabus: CSE062 MOBILE COMPUTING

School:		**SET**			
Program:		**B.Tech**			
Branch:		**CSE**			
1	Course Code	CSE062			
2	Course Title	MOBILE COMPUTING			
3	Credits	3			
4	Contact Hours (L-T-P)	3	0	0	
	Course Status	Core /Elective			
5	Course Objective	The objective of the course is to impart knowledge of mobile and wireless computing systems and techniques			
6	Course Outcomes (5-6)	On successful completion of this module students will be able to CO1: synthesize the basic concepts and principles in mobile computing. CO2: analyze the concept of wireless& telecommunication networks. CO3: synthesize the concepts of IEEE802.11, Bluetooth and HYPERLAN. CO4: Understand the concept of mobile IP & various Routing Protocols CO5: synthesize the concepts of Mobile Transport Layer & WAP CO6: Comparison of all the protocols			
7	Course Description	This course will cover various topics of mobile computing, networking, and systems, including but not limited to: applications of smart phones, cellular networks, embedded sensor systems, localization systems, energy efficiency of mobile devices, wearable and vehicular mobile systems, mobile security etc.			
8	Outline syllabus				CO Mapping
	Unit 1	**INTRODUCTION**			
	A	Wireless transmission , Frequencies for radio transmission			CO1
	B	Signals , Antennas , Signal Propagation , Multiplexing, Modulations			CO1
	C	Spread spectrum, MAC, SDMA , FDMA , TDMA , CDMA , Cellular Wireless Networks			CO1
	Unit 2	**TELECOMMUNICATION NETWORKS**			
	A	GSM: Mobile services, System architecture, Radio interface, Protocols			CO2
	B	Localization and calling, Handover, Security			CO2
	C	General Packet Radio Service (GPRS): GPRS Architecture, GPRS network nodes,			CO2
	Unit 3	**WIRELESS LANS**			
	A	Introduction to IEEE 802.11b/g/n			CO3
	B	Bluetooth technologies and architecture.			CO3
	C	HIPERLAN, WML programming			CO3
	Unit 4	**MOBILE NETWORK LAYER**			
	A	Mobile IP Goals, Entities, IP packet Delivery Agent Advertisement and Discovery, Registration.			CO4
	B	Hidden and exposed terminal problems ,Routing protocols classification,			CO4

	C	DSDV, DSR, AODV ,Security			CO4
	Unit 5	**Mobile Transport Layer & Wireless Application Protocol**			
	A	Traditional TCP, Indirect TCP,			CO5
	B	Snooping TCP, Mobile TCP			CO5,CO6
	C	WAP: Protocols, Architecture			CO5,CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	2. JochenSchiller : Mobile Communication, Pearson Education. 3. U. Hansman and L. Merck : Principles of Mobile Computing", 2nd Ed., Springer			
	Other References	4. A. S. Tanenbaum. : Computer Networks, 4th Ed., Pearson Education. 5. D. Milojicic, F. Douglis. : Mobility Processes, Computers and Agents",Addison Wesley 6. D.B. Lange and M. Oshima : Programming and Deploying Java Mobile Agents with Aglets, Addison Wesley.			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: synthesize the basic concepts and principles in mobile computing.	PO1, PO2, PO4, PO5, PO10, PSO1, PSO2
2.	CO2: analyze the concept of wireless& telecommunication networks.	PO1, PO2, PO4, PO5, PO10, PSO1, PSO2
3.	CO3: synthesize the concepts of IEEE802.11, Bluetooth and HYPERLAN.	PO1, PO2, PO4, PO5, PO10, PSO1, PSO2
4.	CO4: Understand the concept of mobile IP & various Routing Protocols	PO1, PO2, PO4, PO5, PO10, PSO1, PSO2
5.	CO5: synthesize the concepts of Mobile Transport Layer & WAP	PO1, PO2, PO4, PO5, PO10, PSO1, PSO2
6.	CO6: Comparison of all the protocols	PO1, PO2, PO4, PO5, PO10, PSO1, PSO2

PO and PSO mapping with level of strength for Mobile Computing (CSE 062)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO 3
CSE062_ MOBILE COMPUTING	CO1	3	3	-	2	3	-	-	-	-	2	-	-	3	2	-
	CO2	3	3	-	2	3	-	-	-	-	2	-	-	3	2	-
	CO3	3	3	-	2	3	-	-	-	-	2	-	-	2	3	-
	CO4	3	3	-	2	3	-	-	-	-	2	-	-	3	2	-
	CO5	3	3	-	2	3	-	-	-	-	2	-	-	2	2	-
	CO6	3	3	-	2	3	-	-	-	-	2	-	-	2	2	-
Avg.		3	3	-	2	3	-	-	-	-	2	-	-	2	2	-

School:		School of Engineering and technology		
Department		Department of Computer Science and Engineering		
Program:		B.Tech		
Branch:				
1	Course Code	CSE063		
2	Course Title	Quantum Computing		
3	Credits	3		
4	Contact Hours (L-T-P)	3	0	2
	Course Status	Core /Elective/Open Elective		
5	Course Objective	Fundamentals of quantum information processing, including quantum computation, quantum cryptography, and quantum information theory. Topics include: the quantum circuit model, qubits, unitary operators, measurement, entanglement, quantum algorithms for factoring and search, quantum cryptographic key distribution, error-correction and fault-tolerance, information capacity of quantum channels, complexity of quantum computation.		
6	Course Outcomes (must be 6 COs, following verbs given in Bloom's Taxonomy)	CO1: Analyze the behavior of basic quantum algorithms CO2: Demonstrate simple quantum algorithms CO3: Simulate a simple quantum error-correcting code CO4: Prove basic facts about quantum information channels CO5: Explain quantum computing and quantum protocols CO6: Illustrate information channels in the quantum circuit model.		
7	Course Description	This course teaches the fundamentals of quantum information processing, including quantum computation, quantum cryptography, and quantum information theory.		
8	Outline syllabus			CO Mapping
	Unit 1	Introduction		
	A	Computers and the Strong Church–Turing Thesis, Circuit Model of Computation		
	B	A Linear Algebra Formulation of the Circuit Model, Reversible Computation		CO1
	C	Quantum Physics and Computation		CO1, CO2
	Unit 2	LINEAR ALGEBRA AND THE DIRAC NOTATION		CO1, CO2,CO4
	A	The Dirac Notation and Hilbert Spaces, Dual Vectors, Operators		
	B	The Spectral Theorem, Functions of Operators		
	C	Tensor Products, The Schmidt Decomposition Theorem		CO1, CO2
	Unit 3	A QUANTUM MODEL OF COMPUTATION		CO1, CO2
	A	The Quantum Circuit Model, Quantum Gates		CO1, CO2,CO5,CO6
	B	Universal Sets of Quantum Gates, Efficiency of Approximating Unitary Transformations		
	C	Implementing Measurements with Quantum Circuits		
	Unit 4	INTRODUCTORY QUANTUM ALGORITHMS		CO1,CO2,CO3
	A	Probabilistic Versus Quantum Algorithms, Phase Kick-Back		CO1,CO2,CO3
	B	The Deutsch Algorithm, The Deutsch–Jozsa Algorithm		CO1,CO2,CO3
	C	Simon's Algorithm		
	Unit 5			
	A	Tools for Analysing Probabilistic Algorithms		CO2,CO3,CO4
	B	Solving the Discrete Logarithm Problem When the Order of a Is Composite		CO3,CO4

	C	Computing Schmidt Decompositions			CO2, CO4,CO5
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	"An Introduction to Quantum Computing", Phillip Kaye Raymond Laflamme, Michele Mosca			
	Other References				

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Analyze the behavior of basic quantum algorithms	
2.	CO2: Demonstrate simple quantum algorithms	PO1, PO2, PO5, PO8, PO12, PSO3
3.	CO3: Simulate a simple quantum error-correcting code	PO1, PO2, PO3, PSO3
4.	CO4: Prove basic facts about quantum information channels	PO1, PO2, PO3, PO5, PO9, PO12, PSO1
5.	CO5: Explain quantum computing and quantum protocols	PO1, PO2, PO4, PO5, PO6, PO8, PSO2
6.	CO6: Illustrate information channels in the quantum circuit model	PO1, PO2, PO3, PO8, PO9, PSO2,

PO and PSO mapping with level of strength for Course Name Quantum Computing (Course Code CSE063)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
Quantum Computing	CO1	3	3	-	-	2	-	-	3	-	-	-	3	-	-	3
	CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	3
	CO3	3	3	2	-	2	-	-	-	2	-	-	2	3	-	-
	CO4	3	3	-	3	2	3	-	2	-	-	-	-	-	3	-
	CO5	3	2	3	-	-	-	-	3	3	-	-	-	-	3	-
	CO6	3	3	-	3	3	3	3	-	-	3	3	-	3	-	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
	Quantum Computing	3	2.7	1.1	1	1.5	1	.5	1.3	.8	.5	.5	.8	1	1	1

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School:		**School of Engineering and Technology**	
Department		**Department of Computer Science and Engineering**	
Program:		**B.Tech**	
Branch:		**CSE with Specialization in Internet of Things & Applications**	
1	Course Code	CSE071	
2	Course Title	Introduction to Internet of Things	
3	Credits	2	
4	Contact Hours (L-T-P)	2-0-0	
	Course Status	Elective	
5	Course Objective	In this course, student will explore various concepts of Internet of things such as things, enabling technologies, M2M to IoT and IoT architecture. This course also discusses the security challenges and then provides answers on how to successfully manage IoT security and build a safe infrastructure for smart devices. In the end they will also be able to identify the challenges in IoT and its various areas of application.	
6	Course Outcomes	CO1: Define the general concepts of Internet of Things. CO2: Recognize the basic M2M Ecosystem and change from M2M to IoT. CO3: Outline the concepts of IoT platform. CO4: Explain IoT security and vulnerability threats. CO5: Examine the challenges in IoT specific application. CO6: Discuss the various domains where IOT can be applied successfully.	
7	Course Description	This course introduces the concepts for internet of things and how we can embed it into our daily lives for the development of life style. It will also help students to understand the applications according to their problem statements.	
8	Outline syllabus		CO Mapping
	Unit 1	**Introduction to IoT**	
	A	Defining IoT, History of IoT, Importance of IoT , IoT Basic Characteristics, Enabling Technologies of IoT	CO1
	B	About the Internet in IoT, IoT Advantages and Disadvantages, M2M Overview, M2M Features	CO1
	C	M2M Ecosystem, Comparison of the Main Characteristics of M2M and IoT, M2M Applications	CO1
	Unit 2	**IoT Architecture**	
	A	Basic Building blocks of IoT system: Sensors, Processors, gateways, Applications	CO1, CO2
	B	Physical design of IoT: Things in IOT, IoT Protocols, Logical design of IoT: IoT Functional Blocks, IoT Communication Models. IoT Communication API's	CO1, CO2
	C	IoT Service Oriented Architecture (SOA), API Oriented Architecture.	CO1, CO2
	Unit 3	**Introduction to IoT Platform**	
	A	IoT Working, Introduction to Arduino and Raspberry Pi	CO1, CO3
	B	The SENSEnut Platform, Peripheral Hardware Specific	CO1, CO3

		Calls: DIO Functions, I^2C Functions			
	C	MAC functions: General Functions, Coordinator Functions, genMac Functions			CO1, CO3
	Unit 4	**Vulnerabilities, Attacks, and Countermeasures**			
	A	Cyber security versus IoT security and cyber-physical systems, Need to secure IoT			CO1, CO4, CO5
	B	Primer on threats, vulnerability, and risks (TVR)			CO1, CO4, CO5
	C	Common IoT attacks, Today's IoT attacks , Threat modeling for an IoT system			CO1, CO4, CO5
	Unit 5	**Domain specific applications of IoT**			
	A	Home automation concept and case study			CO1, CO3, CO6
	B	Industry applications concept and case study			CO1, CO3, CO6
	C	Surveillance applications concept and case study, Other IoT applications			CO1, CO3, CO6
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	1. The Internet of Things: Connecting Objects to the Web edited by Hakima Chaouchi, Reference for Unit-1. 2. Introduction to Internet of Things, Prof. Sudip Misra, NPTEL Lectures Notes, Department of Computer Science and Engineering, Indian Institute of Technology Kharagpur, Reference for Unit 2, 3 (c), 4. 3. Internet of Things, Rajkumar Buyya, Reference for Unit 3 (c) 4. Arshdeep Bahga and Vijay Madisetti, “Internet of Things – A Hand-on Approach”, Universities press, 2015, Reference for Unit 3 (B) 5. API REFERENCE GUIDE: SENSEnuts WSN sensation 6. Practical Internet of Things Security, Brian Russell, Drew Van DurenCopyright © 2016 Packt Publishing			
	Other References	1. Charalampos Doukas , "Building Internet of Things with the Arduino", Create space, April 2002 2. Dr. Ovidiu Vermesan and Dr. Peter Friess, “Internet of Things: From research and innovation to market deployment”, River Publishers 2014. 3. Contiki : The open source for IOT, www.contiki-os.org			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Define the general concepts of Internet of Things.	PO1, PO2, PO3, PO6, PO7, PO12, PSO1
2.	CO2: Recognize the basic M2M Ecosystem and change from M2M to IoT.	PO1, PO2, PO3, PO6, PO7, PO12, PSO1
3.	CO3: Outline the concepts of IoT platform.	PO1, PO2, PO3, PO4, PO6, PO7, PO12, PSO1
4.	CO4: Explain IoT security and vulnerability threats.	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, P011, PO12, PSO1, PSO2, PSO3
5.	CO5: Examine the challenges in IoT specific application.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO12, PSO1
6.	CO6: Discuss the various domains where IOT can be applied successfully.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO12, PSO1

PO and PSO mapping with level of strength for Course Name Introduction to Internet of Things (Course Code)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	PSO 3
_ Introduction to Internet of Things	CO1	3	1	1	-	-	2	1	-	-	-	-	3	3	-	-
	CO2	2	2	1	-	-	1	3	-	-	-	-	3	3	-	-
	CO3	3	1	1	2	-	2	1	-	-	-	-	3	3	-	-
	CO4	**3**	**3**	**3**	**3**	**2**	**2**	**-**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**
	CO5	3	3	3	3	3	2	3	-	-	-	-	3	3	-	-
	CO6	2	2	2	2	3	2	3	-	-	-	-	3	3	-	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 2
	Introduction to Internet of Things	2.7	2.0	1.8	2.5	2.7	1.8	2.2	3.0	3.0	3.0	3.0	3.0	2.8	2.0	3.0

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

School:		School of Engineering and technology		
Department		Department of Computer Science and Engineering		
Program:		B.Tech		
Branch:				
1	Course Code	CSE072		
2	Course Title	Parallel Computing Algorithms		
3	Credits	2		
4	Contact Hours (L-T-P)	2	0	2
	Course Status	Core /Elective/Open Elective		
5	Course Objective	Design and analysis of parallel algorithms on various parallel network model, with emphasis on time complexities after implementation, a comparative study of various architecture with respect to time complexity. Understanding the fundamental of parallel algorithms.		
6	Course Outcomes (must be 6 COs, following verbs given in Bloom's Taxonomy)	CO1: Acquire the skill to design and develop parallel algorithms with efficient time complexity. CO2: Explain various terminology of parallel processing which is required to design and understand the future processor architectures. CO3: Demonstrate the skill to choose the technology to use, based on the requirements and functionality of multi-processor architecture based on the design parameters of the parallel architectures. CO4: Explain how large-scale parallel systems are architecture and how massive parallelism are implemented in accelerator architectures CO5: Design efficient parallel algorithms and applications CO6: Analyse performance and modeling of parallel programs		
7	Course Description	This course introduces critical methods and techniques related to parallel computing. Particularly, the course focuses on hardware, algorithm, and programming of parallel systems, providing students a complete picture to understand pervasive parallel computing.		
8	Outline syllabus			CO Mapping
	Unit 1	Introduction		
	A	Introduction to Parallel Processing Approach		
	B	Difference between Parallel Processing and Serial Processing, Background, Flynn's Taxonomy for serial and parallel computer architecture		CO1
	C	Parallel Algorithms, Performance of Parallel Algorithm.		CO1, CO2
	Unit 2	Basic Techniques and Different Network Architecture		CO1, CO2,CO4
	A	Criteria to evaluate processor organization		
	B	Mesh Networks, Binary Tree Networks, Hypertree Networks, Pyramid Networks, Butterfly Networks, Hypercube (Cube-Connected) Networks,		
	C	Cube-Connected Cycle Networks, Shuffle-Exchange Networks, Case Studies Based on the Parallel Network Architecture.		CO1, CO2
	Unit 3	Parallel Architectures		CO1, CO2
	A	Multiprocessors, Uniform Memory Access (UMA) Multiprocessors and Non-Uniform Memory Access, Mesh of Trees Architecture,		CO1, CO2,CO5,CO6
	B	Applications based on MoT, Advantages/Disadvantages of MoT based on parallel parameters, Multi-Mesh Architecture,		
	C	Applications based on MM, Advantages/Disadvantages of MM based on parallel parameters Multi-Mesh of Trees Architecture, Advantages of MMT over MM and MoT		
	Unit 4	Parallel Algorithms on Different Architectures		CO1,CO2,CO3
	A	One to One Communication Algorithm on Multi-Mesh Architecture and Multi-Mesh of Trees Architecture,		CO1,CO2,CO3

	B	All-to-All Algorithm Communication Algorithm on Multi-Mesh Architecture and Multi-Mesh of Trees Architecture,			CO1,CO2,CO3
	C	Sorting Algorithms on MMT, Case Studies based on MMT Architecture			
	Unit 5	Parallel computing Application			
	A	Performance measurement and analysis of parallel programs			CO2,CO3,CO4
	B	Problem solving on clusters using MapReduce			CO3,CO4
	C	Warehouse-scale computing			CO2, CO4,CO5
	Mode of examination	Theory/Jury/Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	"Introduction to Parallel Computing", 2nd Ed, Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar			
	Other References	• "Using MPI: Portable Parallel Programming with the Message-Passing Interface", 3rd Ed - William Gropp, Ewing Lusk, Anthony Skjellum • "Programming Massively Parallel Processors: A Hands-on Approach", 3rd Ed. - David B. Kirk, Wen-mei W. Hwu			

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO) & Program Specific Outcomes (PSO)
1.	CO1: Acquire the skill to design and develop parallel algorithms with efficient time complexity.	
2.	CO2: Explain various terminology of parallel processing which is required to design and understand the future processor architectures.	PO1, PO2, PO5, PO8, PO12, PSO3
3.	CO3: Demonstrate the skill to choose the technology to use, based on the requirements and functionality of multi-processor architecture based on the design parameters of the parallel architectures.	PO1, PO2, PO3, PSO3
4.	CO4: Explain how large-scale parallel systems are architecture and how massive parallelism are implemented in accelerator architectures	PO1, PO2, PO3, PO5, PO9, PO12, PSO1
5.	CO5: Design efficient parallel algorithms and applications	PO1, PO2, PO4, PO5, PO6, PO8, PSO2
6.	CO6: Analyse performance and modeling of parallel programs	PO1, PO2, PO3, PO8, PO9, PSO2,

PO and PSO mapping with level of strength for Course Name Parallel Computing (Course Code CSE072)

Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
Parallel Computing	CO1	3	3	-	-	2	-	-	3	-	-	-	3	-	-	3
	CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	3
	CO3	3	3	2	-	2	-	-	-	2	-	-	2	3	-	-
	CO4	3	3	-	3	2	3	-	2	-	-	-	-	-	3	-
	CO5	3	2	3	-	-	-	-	3	3	-	-	-	-	3	-
	CO6	3	3	-	3	3	3	3	-	-	3	3	-	3	-	-

Average of non-zeros entry in following table (should be auto calculated).

Course Code	Course Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
	Parallel Computing	3	2.7	1.1	1	1.5	1	.5	1.3	.8	.5	.5	.8	1	1	1

Strength of Correlation

1. Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
3. Addressed to *Substantial (High=3) extent*

School:		School of engineering and technology		
Department		Department of computer science and engineering		
Program:		B.tech		
Branch:				
1	Course code	CSE073		
2	Course title	3d printing and software tools		
3	Credits	2		
4	Contact hours (l-t-p)	2	0	0
	Course status	Core /elective/open elective		
5	Course objective	This course will help understand the technical principles and work flows of polymers, metals, and composites.		
6	Course outcomes (must be 6 cos, following verbs given in bloom's taxonomy)	Co1: apply the unique advantages of 3d printing to their designs. Co2: compare additive manufacturing to traditional technologies and choose the best technology for a given application. Co3: distinguish between various 3d printing technologies and materials and select appropriately for a given application. Co4: discuss the economic implications of 3d printing including its impact on startup businesses and supply chains Co5: evaluate real-life scenarios and recommend the appropriate use of 3d printing technology Co6: explain current and emerging 3d printing applications in a variety of industries		
7	Course description	In this course students will gain broad understanding of the advances that led to today's manufacturing environment. They will understand how humans, machines and code work together to make things.		
8	Outline syllabus			Co mapping
	Unit 1	Introduction to 3d printing		
	A	Cutting, subtractive manufacturing		
	B	Forming		Co1
	C	Additive manufacturing		Co1, co2
	Unit 2	Mesh		Co1, co2,co4
	A	Review of geometry terms		
	B	Things to consider when preparing a mesh file		
	C	Making process (a reminder), making by sharing		Co1, co2
	Unit 3	Introduction to computer numerical control (cnc)		Co1, co2
	A	Numerical control, functions of a machine tool, concept of numerical control, historical development, definition		Co1, co2,co5,co6

	B	Advantages of cnc machine tools, evolution of cnc, advantages of cnc, limitations of cnc, features of cnc			
	C	The machine control unit (mcu) for cnc, classification of cnc machine tools, cnc machining centers			
	Unit 4	Blue print reading			Co1,co2,co3
	A	Reading the machining sketches, different geometrical tolerance symbols,			Co1,co2,co3
	B	Reading dimensional tolerances, understanding the views,			Co1,co2,co3
	C	Concept of first angle & third angle projection			
	Unit 5	Cnc milling			
	A	Fundamentals of cnc milling, familiarization of control panel			Co2,co3,co4
	B	Fundamentals of cnc programming, part programming techniques			Co3,co4
	C	Machining practice on cnc milling, practice session at industry			Co2, co4,co5
	Mode of examination	Theory/jury/practical/viva			
	Weightage distribution	Ca	Mte	Ete	
		30%	20%	50%	
	Text book/s*	Liza Wallach Kloski, Nick Kloski – "Getting Started with 3D Printing_ A Hands-on Guide to the Hardware, Software, and Services Behind the New Manufacturing Revolution"-Maker Media, Inc (2016)			
	Other references				

Co and po mapping

S. No.	Course outcome	Program outcomes (po) & program specific outcomes (pso)
1.	Co1: apply the unique advantages of 3d printing to their designs.	
2.	Co2: compare additive manufacturing to traditional technologies and choose the best technology for a given application.	Po1, po2, po5, po8, po12, pso3
3.	Co3: distinguish between various 3d printing technologies and materials and select appropriately for a given application.	Po1, po2, po3, pso3
4.	Co4: discuss the economic implications of 3d printing including its impact on startup businesses and supply chains	Po1, po2, po3, po5, po9, po12, pso1
5.	Co5: evaluate real-life scenarios and recommend the appropriate use of 3d printing technology	Po1, po2, po4, po5, po6, po8, pso2
6.	Co6: explain current and emerging 3d printing applications in a variety of industries	Po1, po2, po3, po8, po9, pso2,

Po and pso mapping with level of strength for course name 3d printing and software tools (course code CSE073)

Course code_ course name	Co's	Po 1	Po 2	Po 3	Po 4	Po 5	Po 6	Po 7	Po 8	Po 9	Po 10	Po 11	Po 12	Pso 1	Pso 2	Pso 3
3d printing and software tools	Co1	3	3	-	-	2	-	-	3	-	-	-	3	-	-	3
	Co2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	3
	Co3	3	3	2	-	2	-	-	-	2	-	-	2	3	-	-
	Co4	3	3	-	3	2	3	-	2	-	-	-	-	-	3	-
	Co5	3	2	3	-	-	-	-	3	3	-	-	-	-	3	-
	Co6	3	3	-	3	3	3	3	-	-	3	3	-	3	-	-

Average of non-zeros entry in following table (should be auto calculated).

Course code	Course name	Po 1	Po 2	Po 3	Po 4	Po 5	Po 6	Po 7	Po 8	Po 9	Po 10	Po 11	Po 12	Pso 1	Pso 2	Pso 3
	3d printing and software tools	3	2.7	1.1	1	1.5	1	.5	1.3	.8	.5	.5	.8	1	1	1

Strength of correlation

1. Addressed to *slight (low=1) extent 2.* Addressed to *moderate (medium=2) extent*
3. Addressed to *substantial (high=3) extent*

CSE472**: Artificial Intelligence**

School: SET		**Batch : 2018-2022**	
Program: B.Tech			
Branch: ALL		**Semester: VII**	
1	**Course Code**	**CSE472**	**Course Name: Artificial Intelligence**
2	**Course Title**	**Artificial Intelligence**	
3	**Credits**	**3**	
4	**Contact Hours (L-T-P)**	**3-0-0**	
	Course Status	**CORE**	
5	Course Objective	The objective of the course is to introduce basic fundamental concepts in Artificial Intelligence (AI), with a practical approach in understanding them. To visualize the scope of AI and its role in futuristic development.	
6	Course Outcomes	After the completion of this course, students will be able to: CO-1. ***Relate*** the goals of Artificial Intelligence and AI and non-AI solution. CO-2. ***Analyze and*** various AI uninformed and informed search algorithms. CO-3. ***Extend*** knowledge representation, reasoning, and theorem proving techniques to real-world problems CO-4. ***Make use of:*** Machine learning algorithms in various application domains of AI. CO-5. ***Select*** Artificial Intelligent based applications. CO-6. ***Develop*** independent (or in a small group) research and communicate it effectively.	
7	Course Description	In this course students will learn basic introduction of Artificial Intelligence, problem solving agents, reasoning, learning and applications of artificial intelligence.	
8	Outline syllabus		CO Mapping
	Unit 1	**INTRODUCTION TO AI**	
	A	Foundation of AI, Goals of AI, History and AI course line	CO1
	B	Introduction to Intelligent Agents; Environment; Structure of Agent	CO1
	C	AI Solutions Vs Conventional Solutions; a philosophical approach; a practical approach	CO1, CO2
	Unit 2	**PROBLEM SOLVING AGENTS**	
	A	Problem solving using Search Techniques; Problems; Solutions; Optimality	CO1, CO2
	B	Informed Search Strategies; Greedy Best-First; A* Search; Heuristic Functions	CO1, CO2
	C	Uninformed Search Strategies; BFS; DFS; DLS; UCS; IDFS; BDS	CO1, CO2
	Unit 3	**KNOWLEDGE & REASONING**	
	A	Knowledge-Based Agents; Logic; First-Order Logic; Syntax-Semantics in FOL; Simple usage;	CO3
	B	Inference Procedure; Inference in FOL; Reduction; Inference Rules;	CO3
	C	Forward Chaining; Backward Chaining; Resolution	CO3
	Unit 4	**LEARNING**	
	A	Common Sense Vs Learning; Components; Representations; Feedback	CO1, CO2, CO3,CO4
	B	Learning Types: Supervised; Unsupervised;	CO1, CO2,

		Reinforcement Learnings			CO3,CO4
	C	Artificial Neural Networks: Introduction, types of networks; Single Layer and Multi-Layer n/w.			CO1, CO2, CO3,CO4
	Unit 5	**APPLICATIONS**			
	A	AI Present & Future; application case studies on NLP, Image Processing;			CO3, CO4, CO5, CO6
	B	Robotics – Hardware; Vision; Navigation based case studies;			CO3, CO4, CO5, CO6
	C	Ambient Intelligence case studies;			CO3, CO4, CO5, CO6
	Mode of examination	Theory			
	Weightage Distribution	CA	MTE	ETE	
		30%	20%	50%	
	Text book/s*	**1. Rich E**& Knight K, **Artificial Intelligence,** Tata McGraw Hill, Edition 3.			
	Reference Books	1. Russell S &Norvig P, *Artificial Intelligence: A Modern Approach*, Prentice Hall. 2. Dan W. Patterson, Artificial Intelligence & Expert Systems, Pearson Education with Prentice Hall India. Indian Edition.			

Course Outcomes:

Sl. No.	Course Outcome (CO)	
CO-1:	***Relate*** the goals of Artificial Intelligence and AI and non-AI solution.	PO3, PO4, PO5, PO10, PSO1, PSO2, PSO3
CO-2:	***Analyze and*** various AI uninformed and informed search algorithms.	PO1, PO2, PO3, PO4, PO5, PO10, PSO1, PSO2, PSO3
CO-3:	***Extend*** knowledge representation, reasoning, and theorem proving techniques to real-world problems	PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2, PSO3
CO-4:	***Make use of:*** Machine learning algorithms in various application domains of AI.	PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2, PSO3
CO-5:	***Select*** Artificial Intelligent based applications.	PO1, PO2, PO3, PO4, PO5, PO9, PO10 PO12, PSO1, PSO2, PSO3
CO-6:	***Develop*** independent (or in a small group) research and communicate it effectively.	PO1, PO2, PO3, PO4, PO5, PO9, PO10 PO12, PSO1, PSO2, PSO3

Mapping of POs & COs: CO-PO and CO-PSO Mapping with level of strength

Course Objectives	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	3	2	2					2		2	3	2	2
CO2	2	3	3	2	3					2		2	3	3	2
CO3	3	3	3	3	2	1	1			1	2	3	3	2	3
CO4	3	3	3	3	2	2	1			2	1	3	3	2	3
CO5	2	3	3	3	3	2	2	2	3	2	2	2	3	3	2
CO6	2	3	3	3	3	2	2	2	3	2	2	2	3	3	2

CSP472: Artificial Intelligence Lab

School:		**School of Engineering and technology**	
Department		**Department of Computer Science and Engineering**	
Program:		**B-TECH**	
Branch:		**Computer Science and Engineering**	
1	Course Code	CSP472	
2	Course Title	**Artificial Intelligence Lab**	
3	Credits	1	
4	Contact Hours (L-T-P)	0-0-2	
	Course Status	Compulsory	
5	Course Objective	The objective of the course is to introduce basic fundamental concepts in Artificial Intelligence (AI), with a practical approach in understanding them. To visualize the scope of AI and its role in futuristic development. • To develop a sense of appreciation for traditional AI Programming • To use classical AI problems to understand cognitive process. • To have an overview of the various processes involved in Machine Learning • To develop a working model of real life problem base on Artificial Agent.	
6	Course Outcomes	After the completion of this course, students will be able to: CO-1. ***Relate*** the goals of Artificial Intelligence and AI and non-AI solution. CO-2. ***Analyze and*** various AI uninformed and informed search algorithms. CO-3. ***Extend*** knowledge representation, reasoning, and theorem proving techniques to real-world problems CO-4. ***Make use of:*** Machine learning algorithms in various application domains of AI. CO-5. ***Select*** Artificial Intelligent based applications. CO-6. ***Develop*** independent (or in a small group) research and communicate it effectively.	
7	Course Description	In this course students will learn basic introduction of Artificial Intelligence, problem solving agents, reasoning, learning and applications of artificial intelligence.	
8	Outline syllabus		CO Mapping
	Unit 1	**Practical based on goal based problems**	
		Sub unit - a, b and c detailed in Instructional Plan	
	Unit 2	**Practical related to uninformed search algorithm.**	
		Sub unit - a, b and c detailed in Instructional Plan	
	Unit 3	**Practical related to informed search algorithm.**	
		Sub unit - a, b and c detailed in Instructional Plan	
	Unit 4	**Practical related to knowledge representations and logical reasoning**	
		Sub unit - a, b and c detailed in Instructional Plan	
	Unit 5	**Practical related to machine learning algorithms**	

		Sub unit - a, b and c detailed in Instructional Plan			
	Mode of examination	Practical/Viva			
	Weightage Distribution	CA	MTE	ETE	
		60%	0%	40%	
	Text book/s*	**2. Rich E**& Knight K, **Artificial Intelligence,** Tata McGraw Hill, Edition 3.			
	Other References	3. Russell S &Norvig P, *Artificial Intelligence: A Modern Approach*, Prentice Hall. 4. Dan W. Patterson, Artificial Intelligence & Expert Systems, Pearson Education with Prentice Hall India. Indian Edition.			

Course Outcomes:

Sl. No.	Course Outcome (CO)	
CO-7:	***Relate*** the goals of Artificial Intelligence and AI and non-AI solution.	PO3, PO4, PO5, PO10, PSO1, PSO2, PSO3
CO-8:	***Analyze and*** various AI uninformed and informed search algorithms.	PO1, PO2, PO3, PO4, PO5, PO10, PSO1, PSO2, PSO3
CO-9:	***Extend*** knowledge representation, reasoning, and theorem proving techniques to real-world problems	PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2, PSO3
CO-10:	***Make use of:*** Machine learning algorithms in various application domains of AI.	PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2, PSO3
CO-11:	***Select*** Artificial Intelligent based applications.	PO1, PO2, PO3, PO4, PO5, PO9, PO10 PO12, PSO1, PSO2, PSO3
CO-12:	***Develop*** independent (or in a small group) research and communicate it effectively.	PO1, PO2, PO3, PO4, PO5, PO9, PO10 PO12, PSO1, PSO2, PSO3

PO and PSO mapping with level of strength for Course Name Artificial Intelligence Lab (Course Code CSP472)

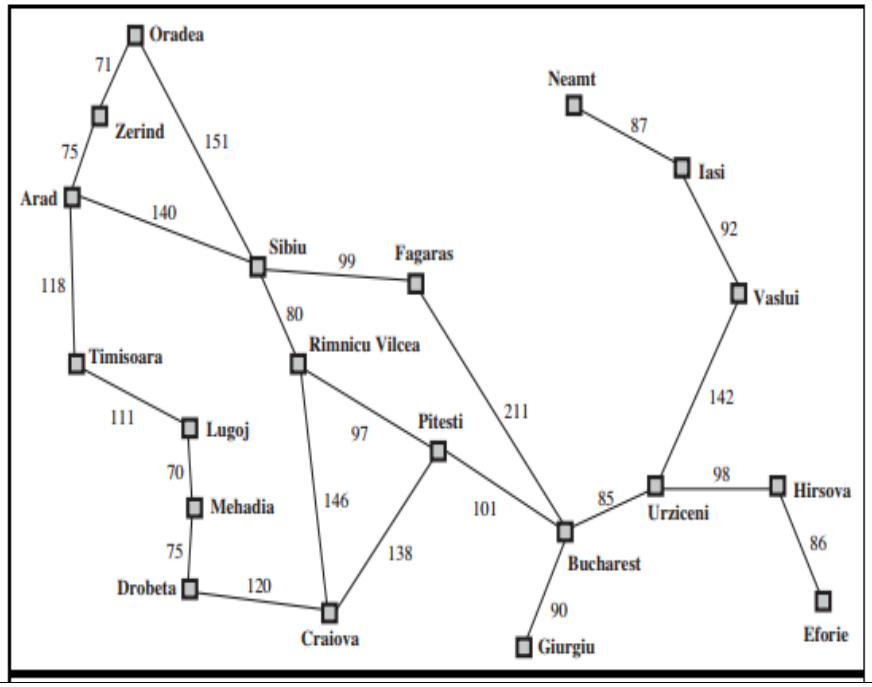
Course Code_ Course Name	CO's	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CSP 472: Artificial Intelligence Lab	CO1	1	2	3	2	2					2		2	3	2	2
	CO2	2	3	3	2	3					2		2	3	3	2
	CO3	3	3	3	3	2	1	1			1	2	3	3	2	3
	CO4	3	3	3	3	2	2	1			2	1	3	3	2	3
	CO5	2	3	3	3	3	2	2	2	3	2	2	2	3	3	2
	CO6	2	3	3	3	3	2	2	2	3	2	2	2	3	3	2

Strength of Correlation

1. Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
3. Addressed to ***Substantial (High=3) extent***

List of Practical's:

	Unit 1	Practical based on goal based problems	
Week 1	a	Lab expt.1	Implementation of Water Jug Problem.
Week 2, 3	b	Lab expt.2	Introduction to Lisp, and basic programming in Lisp like following: i. Write a LISP function to compute sum of squares. ii. Write a LISP function to compute difference of squares. (if x > y return $x^2 - y^2$, Otherwise $y^2 - x^2$). iii. Write a Recursive LISP function which takes one argument as a list and return last element of the list. (Do not use last predicate.) iv. Write a Recursive LISP function which takes one argument as a list and return list except last element of the list. (Do not use butlast.) v. Write a Recursive LISP function which takes one argument as a list and return reverse of the list. (Do not use reverse predicate). vi. Write a Recursive LISP function which takes two arguments first an atom second a list returns a list after removing first occurrence of that atom within the list. vii. Write a Recursive LISP function which appends two lists together. viii. Write a recursive LISP function which takes 2 lists as arguments and returns a list containing alternate elements from each list.
Week 4	c	Lab expt.3	Advance programming in Lisp like following: i. Write a function that compute the factorial of a number.(factorial of 0 is 1, and factorial of n is n*(n-1)*...1.Factorial is defined only for integers greater than or equal to 0.) ii. Write a function that evaluate a fully parenthesized infix arithmetic expression. For examples, (infix (1+ (2*3))) should return 7. iii. Write a function that performs a depth first traversal of binary tree. The function should return a list containing the tree nodes in the order they were visited. iv. Write a LISP program for water jug problem. v. Write a LISP program that determines whether an integer is prime.
	Unit 2	**Practical related to uninformed search algorithm.**	
Week 5	a, b,	Lab expt.4	Refer following figure as map with distance details, Write a program in your preferred language to generate path from ARAD to BUCHREST, analyze result obtained by a) Depth First Search b) Breadth First Search c) Uniform Cost Search

			
Week 6	c	Lab expt.5	Write a program in your preferred language to generate steps to solve Tower of Hanoi problem.
	Unit 3	**Practical related to informed search algorithm.**	
Week 7	Mid term		
Week 8	a,b,c	Lab expt.6	Write a program in your preferred language to solve the 8 puzzle Problem-using A* algorithm.
	Unit 4	**Practical related to knowledge representations and logical reasoning**	
Week 9	A	Lab expt.7	Write PROLOG program to Program to categorize animal characteristics.
Week 10	B	Lab expt.8	Write PROLOG program to solver for the linear equation A*X + B = 0. Let the predicate linear (A, B, X) return the root X of the equation.
Week 11	c	Lab expt.9	Write a PROLOG program that answers questions about family members and relationships includes predicates and rules which define sister, brother, father, mother, grandchild, grandfather and uncle. The program should be able to answer queries such as the following: father(x, Amit) grandson(x, y) uncle (sumit, puneet) mother (anita, x)
	Unit 5	**Practical related to machine learning algorithms**	
Week 12	a,	Project	Project Work Evaluation-0: Problem Statement
Week 13	b	Project	Project Work Evaluation-1: Design Specification
Week 14	c	Project	Project Work Evaluation-2: Development

Syllabus: CSP 497, Capstone - 1

School: SET		**Batch: 2019-2023**			
Program: B.tech		**Current Academic Year: 2019-2020**			
Branch: CSE		**Semester: 7th**			
1	Course Code	**CSP497**	Course Name: **Capstone - 1**		
2	Course Title	Major Project -1			
3	Credits	2			
4	Contact Hours (L-T-P)	0-0-0			
	Course Status	Compulsory			
5	Course Objective	Project being the student's last activity at the institution, it fulfills a purpose of synthesis of all the knowledge they have acquired throughout the different years. In addition, this knowledge must be used in a particular way, in order to solve a specific problem, which lets student demonstrate their aptitude by applying this knowledge.			
6	Course Outcomes	Students will be able to: CO1: Identify problem statement in engineering and technology in selected field of interest. CO2: Analyze the gathered information required to develop a project. CO3: Apply prior knowledge of mathematics, computer science and engineering. CO4: Participate in different teams and to focus on getting a working project done on time with each student being held accountable for their part of the project. CO5: Prepare the designs requirements, functional and conceptual design. CO6: Initiate the actual implementation of the project work to produce the deliverables and explain the work in written and oral forms.			
7	Course Description	The object of Major Project-I is to enable the student to take up investigative study in the broad field of Computer Science & Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on an individual basis or two/three students in a group, under the guidance of a Supervisor.			
8	Outline syllabus				CO Mapping
	Unit 1	Problem identification, Literature survey/Gather & analyze information from multiple sources			CO1, CO2,CO4,
	Unit 2	Formulate solution/ Problem Description: Project Planning, Time and Cost Estimation and budgeting, Risk Management, Project scheduling and Planning Tools: Work Breakdown structure/ LRC/ Gantt charts/CPM/PERT Networks. Creating System Requirement Specifications (Functional & Non Functional)			CO1, CO2, CO3
	Unit 3	Preparing Design: Data Flow Diagrams & Flow Charts, Use of appropriate tools and techniques for project design			CO3, CO4
	Unit 4	Identify and Implement Project Modules.			CO4, CO5
	Unit 5	Use of appropriate tools/technologies for coding the modules			CO2, CO5, CO6
		Report on final problem statement, specifications, project schedule, final concept design and project schedule Report and Presentation - Project Modules development			
	Mode of examination	Practical			
	Weightage Distribution	CA	MTE	ETE	
		60%	NA	40%	
	Text book/s*				
	Other References				

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1: Identify problem statement in engineering and technology in selected field of interest.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
2.	CO2: Analyze the gathered information required to develop a project.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
3.	CO3: Apply prior knowledge of mathematics, computer science and engineering.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
4.	CO4: Participate in different teams and to focus on getting a working project done on time with each student being held accountable for their part of the project.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
5.	CO5: Prepare the designs requirements, functional and conceptual design.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
6.	CO6: Initiate the actual implementation of the project work to produce the deliverables and explain the work in written and oral forms.	PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3

PO and PSO mapping with level of strength for Course Name Major Project -1 (Course Code CSP497)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	2	2	1	2	1	1	2	2	3	3
CO2	3	3	3	3	2	1	1	1	2	1	1	2	3	3	3
CO3	3	1	3	3	2	1	1	1	2	1	1	2	3	3	3
CO4	1	1	2	1	2	3	3	1	2	3	1	2	1	2	3
CO5	1	2	2	1	2	1	1	1	2	2	1	2	1	2	3
CO6	2	1	2	1	3	-	-	1	2	3	1	2	3	3	3

1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)

TERM-VIII

Syllabus: CSP498_Capstone - 2

School: SET		**Batch: 2019-2023**			
Program: B.tech		**Current Academic Year: 2019-2020**			
Branch: CSE / IT		**Semester: VIII**			
1	Course Code	**CSP498**	Course Name: Major Project -2		
2	Course Title	CSP498_Capstone - 2			
3	Credits	8			
4	Contact Hours (L-T-P)	0-0-16			
	Course Status	Compulsory			
5	Course Objective	1. To understand the concept of project design after the completion of project planning 2. Students making decisions within a framework 3. Continuous evaluation of the project 4. A final product to be evaluated for quality			
6	Course Outcomes	Students will be able to: CO1: Demonstrate the implementation of the project. CO2: Identify the test procedure for each implemented module. CO3: Deploy and evaluate the modules to verify the required need of the project. CO4: Use different tools for communication, testing and report writing. CO5: Develop the attitude and ethics of a professional engineer. CO6: Demonstrate an ability to present and defend their project work to a panel of experts.			
7	Course Description	The objective of Major Project-II is to enable the student to extend further the development of project till testing and deployment under the guidance of a Supervisor.			
8	Outline syllabus				CO Mapping
	Unit 1	Complete the implementation of the project. Testing of the modules, Use of appropriate tools/techniques for testing			CO1, CO2
	Unit 2	Deploy & demonstrate developed modules of the project			CO2, CO3
	Unit 3	Preparing a Project Report in the standard format for being evaluated by the Supervisor			CO4, CO5
	Unit 4	Submission of Project and Report to Departmental Committee			CO4, CO5, CO6
	Unit 5	Final Presentation before Departmental Committee			CO6
	Mode of examination	Practical			
	Weight age Distribution	CA			MTE
	Text book/s*	60%	NA	ETE	
				40%	

CO and PO Mapping

S. No.	Course Outcome	Program Outcomes (PO)
1.	CO1: Demonstrate the implementation of the project.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
2.	CO2: Identify the test procedure for each implemented module.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
3.	CO3: Deploy and evaluate the modules to verify the required need of the project.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
4.	CO4: Use different tools for communication, testing and report writing.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
5.	CO5: Develop the attitude and ethics of a professional engineer.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3
6.	CO6: Demonstrate an ability to present and defend their project work to a panel of experts.	PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3

PO and PSO mapping with level of strength for Course Name Major Project -2 (Course Code CSP498)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	2	3	2	2	2	2	2	2	2	3	3	3
CO2	2	2	3	2	3	2	2	2	2	2	2	2	11	3	3
CO3	3	3	3	3	3	2	2	2	2	2	2	1	1	3	3
CO4	2	2	2	2	3	2	2	2	2	3	2	1	1	2	2
CO5	1	2	2	1	3	2	2	2	2	3	2	1	1	2	2
CO6	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2

1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)