Course Details:

Course Name:	Data Structure & Algorithm
Course Code:	PCC-CS301
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	3rd Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To learn and apply the basics of abstract data types.
CO2	To learn and apply the principles of linear and nonlinear data structures.
CO3	To build an application using sorting and searching.
CO4	Design applications with the knowledge of computation and principles of data structures.

Data Structure & Algorithm		CO	Attainment
	CO1	To learn and apply the basics of abstract data types.	10%
	CO2	To learn and apply the principles of linear and nonlinear data structures.	15%
	CO3	To build an application using sorting and searching.	15%
	CO4	Design applications with the knowledge of computation and principles of data structures.	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2		√	√									
CO3			√		√							
CO4			√		√							

Course Details:

Course Name:	Data Structure & Algorithm Lab
Course Code:	PCC-CS391
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	3rd Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design and develop programs using data structure & algorithm concepts.
CO2	Develop simple applications using linear and non-linear data structures & algorithms concepts and understand the access mechanisms and other use and functionalities.
CO3	Implement searching and sorting concepts
CO4	Implement the concepts of graph and hashing

Data Structure & Algorithm Lab		CO	Attainment
	CO1	Design and develop programs using data structure & algorithm concepts.	15%
	CO2	Develop simple applications using linear and non-linear data structures & algorithms concepts and understand the access mechanisms and other use and functionalities.	10%
	CO3	Implement searching and sorting concepts.	10%
	CO4	Implement the concepts of graph and hashing	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√	√										
CO3		√			√							
CO4		√			√							

Course Details:

Course Name:	Computer Organization
Course Code:	PCC-CS302
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	3rd Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.
CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.
CO3	Perform different operations with sequential circuits.
CO4	Understand memory and I/O operations.

Computer Organization		CO	Attainment
	CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.	15%
	CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.	15%
	CO3	Perform different operations with sequential circuits.	25%
	CO4	Understand memory and I/O operations.	10%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2					√		√					
CO3									√			
CO4					√		√					

Course Details:

Course Name:	Computer Organization Lab
Course Code:	PCC-CS392
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	3rd Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.
CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.
CO3	Perform different operations with sequential circuits.
CO4	Understand memory and I/O operations.

Computer Organization Lab		CO		Attainment
	CO1	Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.		10%
	CO2	Understand basic structure of different combinational circuits- multiplexer, decoder, encoder etc.		15%
	CO3	Perform different operations with sequential circuits.		15%
	CO4	Understand memory and I/O operations.		10%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2					√		√					
CO3									√			
CO4					√		√					

Course Details:

Course Name:	Compiler Design

Course Code:	PCC-CS501
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	5th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To apply the basic concept of compilers and discuss on the components as well as the strengths and weaknesses of various phases of designing a compiler.
CO2	To understand the role of finite automata in compiler design.
CO3	To design and analyze algorithms for syntactic or parsing techniques and semantic analysis of the process of designing compilers.
CO4	Apply the knowledge of Type Checking andRun-Time Environments in designing a compiler.
CO5	Apply the knowledge of Intermediate Code Generation, Code Optimization and Code Generations in designing a compiler.

COAttainmentofSubjects

		CO	Attainment
Compiler Design PCC-CS501	CO1	To apply the basic concept of compilers and discuss on the components as well as the strengths and weaknesses of various phases of designing a compiler.	5%
	CO2	To understand the role of finite automata in compiler design.	10%
	CO3	To design and analyze algorithms for syntactic or parsing techniques and semantic analysis of the process of designing compilers.	10%
	CO4	Apply the knowledge of Type Checking and Run-Time Environments in designing a compiler.	15%
	CO5	Apply the knowledge of Intermediate Code Generation, Code Optimization and Code Generations in designing a compiler.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√	√					√	
CO2					√		√					
CO3		√	√	√						√		
CO4	√	√			√	√	√				√	
CO5	√	√			√	√	√				√	

Course Details:

Course Name:	Operating Systems
Course Code:	PCC-CS502
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	5th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand processes and threads.
CO2	Design algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time and Response Time.
CO3	For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system.

		CO	Attainment
Operating Systems	CO1	Understand processes and threads.	20%
	CO2	Design algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time and Response Time.	15%
	CO3	For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2			√	√						√		
CO3			√	√			√			√		

Course Details:

Course Name:	Operating System Lab
Course Code:	PCC-CS592
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	5th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To Analyze different aspects of Linux.
CO2	To Create or design different scripts using shell programming.
CO3	To Create or design different scripts using shell programming.
CO4	Create shared memory with the implementation of reading from, write into shared memory.

CO Attainment of Subjects

		CO	Attainment
Operating System Lab PCC-CS592	CO1	To Analyze different aspects of Linux.	10%
	CO2	To Create or design different scripts using shell programming.	15%
	CO3	To Create or design different scripts using shell programming.	15%
	CO4	Create shared memory with the implementation of reading from, write into shared memory.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2			√	√						√		
CO3			√	√						√		
CO4				√								

Course Details:

Course Name:	Object Oriented Programming
Course Code:	PCC-CS503
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	5th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Specify simple abstract data types and design implementations, using abstraction functions to document them.
CO2	Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity
CO3	Name and apply some common object-oriented design patterns and give examples of their use
CO4	Design applications with an event-driven graphical user interface.

COAttainmentofSubjects

		CO	Attainment
Object Oriented Programming	CO1	Specify simple abstract data types and design implementations, using abstraction functions to document them.	10%
	CO2	Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity	15%
	CO3	Name and apply some common object-oriented design patterns and give examples of their use	15%
	CO4	Design applications with an event-driven graphical user interface.	5%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2		√	√									
CO3			√		√							
CO4			√		√							

Course Details:

Course Name:	**Object Oriented Programming Lab**
Course Code:	**PCC-CS593**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**5th Semester**

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design and develop java programs using object oriented programming concepts
CO2	Develop simple applications using object oriented concepts such as package, exceptions
CO3	Implement multi-threading, and generics concepts
CO4	Create GUIs and event driven programming applications for real world problems

CO Attainment of Subjects

Object Oriented Programming Lab		CO	Attainment
	CO1	Design and develop java programs using object oriented programming concepts	15%
	CO2	Develop simple applications using object oriented concepts such as package, exceptions	15%
	CO3	Implement multi-threading, and generics concepts	15%
	CO4	Create GUIs and event driven programming applications for real world problems	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√	√										
CO3		√			√							
CO4		√			√							

Course Details:

Course Name:	Software Engineering
Course Code:	ESC 501
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	5th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Apply basic SW engineering methods and practices different models, and their appropriate application, SRS Document.
CO2	Determine the role of project management including planning, scheduling, risk management, etc.
CO3	An understanding of software testing approaches such as unit testing and integration testing.
CO4	An understanding of software evolution and related issues such as version management.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√	√					√	
CO2			√	√						√		
CO3					√		√					
CO4					√		√					

CO AttainmentofSubjects

	CO		Attainment
	CO1	Apply basic SW engineering methods and practices different models, and their appropriate application, SRS Document.	15%
Software Engineering	CO2	Design the role of project management including planning, scheduling, risk management, etc.	15%
	CO3	An understanding of software testing approaches such as unit testing and integration testing.	15%
	CO4	An understanding of software evolution and related issues such as version management.	10%
PaperCode (Name)	**CO Number**	**Course Outcomes(CO)**	**ATTAINED**

HSMC301 Economics for Engineers	**CO1**	Analyze the economic decisions making, engineering costs & estimation and classification of costs by applying the knowledge of estimating models. Student will develop an understanding of cash-flow, Rate of return analysis in different socio-environmental situations.	15 %
	CO2	Analyze the inflation and price change would be done to the students for the proper understanding of the price-indexes in economic analysis. Effect of inflation & deflation is analyzed to them to remember and if required to apply in real-life scenarios.	25 %
	CO3	Recognize the types of property, depreciation and expenses and its impact on business,for better understanding of the business environment and apply the knowledge of it.	16 %

Mapping of Course Outcomes and Program Outcomes for the subject Economics for Engineers(HSMC301)

CourseOutcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								
CO2		✓		✓								
CO3							✓					✓

PaperCode(Name)	CO Number	Course_Outcoms (CO)	ATTAINED
PEC-IT501B ArtificialInte lligence	CO1	Apply the goodprogramming skillsto formulate thesolutions forcomputationalpr oblems.	25%
	CO2	Design and developsolutions forinformed anduninformed searchproblemsinA I.	20%
	CO3	Understandandenric h knowledge toselect and apply AItools to synthesizeinformati on anddevelopmodelsw ithin constraints ofapplicationarea.	25%

Mapping of CourseOutcomes and ProgramOutcomesfor theArtificialIntelligence

CourseO utcomes	Program Outcome s											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓				✓	✓					✓	
CO2			✓	✓						✓		
CO3					✓		✓					

Paper Code(Name)	CO Number	CourseOutcomes(CO)	ATTAINED
HSMC501, Industrial Management	CO1	Analyze the concept of innovation andentrepreneurship,contributionsofentrepreneurstothe society,risk-opportunitiesperspectivebyapplyingtheknowledgeoffactorsaffectingthem.	25%
	CO2	Analyze the project management, issuesandproblemsinprojectmanagement, projectlife cycle-initiation/conceptualization phase, determination ofproject feasibility studies would be donetothestudents fortheirproper understandingofsocialcostbenefitanalysis.	20%
	CO3	Identification and illustration of thecritical path and its significance, types offloatsand slacksanditsimpactonbusiness, for better understanding of therecent trendsand applytheknowledge of it.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectIndustrialManagement(HSMC501)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								
CO2		✓		✓								
CO3		✓					✓					

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED
PEC-IT501B Introductionto Philosophicalthoughts	CO1	Identifytheevaluation ofthehistoryof philosophy.	10%
	CO2	Identifyreligious concepts,traditions, andhistoricalpractices overtimeand across cultures.	25%
	CO3	Analyzecourse-related materialtoevaluatethe historicaldevelopment ofcontemporaryissues.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectPhilosophicalthoughts(OEC-CS701B/C)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2		✓										
CO3		✓		✓								

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED

PEC-CS701B CloudComputing	CO1	Understand thefundamentalprinciplesofdistributedcomputing.	15%
	CO2	Understand theimportanc eof virtualizationin distributedcomputing andhowthishasenabled thedevelopmentofClou d Computing	20%
	CO3	Identifyanddefine technicalchallengesfor cloudapplicationsand assesstheirimportance.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectCloudComputing(PEC-CS701B)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							✓					
CO2							✓					
CO3		✓										

Course Details:

Course Name:	CyberSecurity
Course Code:	PEC-CS 702E
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	7th Semester

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED
PEC-CS702E CyberSecurity	CO1	Recognize andanalyzesoftware vulnerabilitiesandsecuritysolutions toreduce the risk ofexploitation.	25%
	CO2	Design operational andstrategic cyber securitystrategiesand policies.	25%
	CO3	Implement cyber securitysolutionsanduse ofcybersecurity,informationassurance,andcyber/computer forensicssoftware/tools.	10%

MappingofCourseOutcomesandProgramOutcomesforthesubjectCyberSecurity(PEC-CS702E)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								✓
CO2			✓	✓								
CO3				✓								

Paper Code(Name)	CO Number	CourseOutcomes(CO)	ATTAINED
	CO1	Analyzetheconceptofinnovationandentrepreneurship,contributionsofentrepreneursto thesociety,risk-opportunities perspective by applyingtheknowledgeoffactorsaffecting them.	10%

			15%
HSMC701,Project ManagementandEntrepreneurship	CO2	Analyzetheproject management,issuesandproblems in projectmanagement,projectlife cycle-initiation/conceptualization phase, determinationof project feasibility studies will bedone tothe studentsfortheirproper understandingofsocialcostbenefitan alysis.	15%
	CO3	Identify and recognize the critical pathand its significance, types of floats andslacks and its impact on business, forbetterunderstanding oftherecent trends and applythe knowledgeofit.	25%

MappingofCourseOutcomesandProgramOutcomesforthesubjectProjectManagement and Entrepreneurship(HSMC701)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓								
CO2		✓		✓								
CO3		✓										✓

Course Name:	Design and Analysis of Algorithms
Course Code:	PCC-CS404
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	4th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To analyze and identify the Complexity of a problem and compute the recurrence relation.
CO2	To analyze the several algorithms design techniques on some certain problems using divide & conquer method, dynamic programming approach and backtracking, greedy method.
CO3	To understand lower bound theory, graph traversal algorithm, network flow, disjoint set manipulation different method.
CO4	To design the algorithm of string matching problem, matrix manipulation algorithm.
CO5	To understand amortize analysis, approximation algorithm, notion of NP-completeness.

COAttainmentofSubjects

		CO	Attainment
Design and Analysis of Algorithms (PCC-CS404)	**CO1**	To analyze and identify the Complexity of a problem and compute the recurrence relation.	10%
	CO2	To analyze the several algorithms design techniques on some certain problems using divide & conquer method, dynamic programming approach and backtracking, greedy method.	15%
	CO3	To understand lower bound theory, graph traversal algorithm, network flow, disjoint set manipulation different method.	5%
	CO4	To design the algorithm of string matching problem, matrix manipulation algorithm.	15%
	CO5	To understand amortize analysis, approximation algorithm, notion of NP-completeness.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2		√	√	√						√		
CO3					√		√					
CO4			√	√						√		√
CO5					√		√					

Course Details

Course Name:	Design and Analysis of Algorithm Lab
Course Code:	PCC-CS494
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	4th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design algorithm and implement C program using divide and conquer approach in Computer Science and Engineering and related fields.
CO2	Design algorithm and implement C program using dynamic programming in Computer Science and Engineering and related fields.
CO3	Design algorithm and implement C program using branch and bound method in Computer Science and Engineering and related fields.
CO4	Design algorithm and implement C program using backtracking in Computer Science and Engineering and related fields.
CO5	Design algorithm and implement C program using greedy method in Computer Science and Engineering and related fields.
CO6	Design Graph Traversal Algorithm and implement C program in Computer Science and Engineering and related fields.

COAttainment

		CO	Attainment
Design and Analysis of Algorithm Lab (PCC-CS494)	CO1	Design algorithm and implement C program using divide and conquer approach in Computer Science and Engineering and related fields.	15%
	CO2	Design algorithm and implement C program using dynamic programming in Computer Science and Engineering and related fields.	5%
	CO3	Design algorithm and implement C program using branch and bound method in Computer Science and Engineering and related fields. App	5%
	CO4	Design algorithm and implement C program using backtracking in Computer Science and Engineering and related fields.	15%
	CO5	Design algorithm and implement C program using greedy method	10%

		in Computer Science and Engineering and related fields.	
	CO6	Design Graph Traversal Algorithm and implement C program in Computer Science and Engineering and related fields.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3			√	√						√		
CO4			√	√						√		
CO5			√	√						√		

Course Name:	Computer Architecture
Course Code:	PCC-CS402
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	4th Semester

COURSE OUTCOME:
On successful completion of this course, students should be able to:

CO1	Design pipelining concepts with a prior knowledge of stored program methods
CO2	Design about memory hierarchy and mapping techniques
CO3	Understand parallel architecture and interconnection network

CO Attainment

		CO	Attainment
Computer Architecture (PCC-CS402)	CO1	Design pipelining concepts with a prior knowledge of stored program methods	10%
	CO2	Design about memory hierarchy and mapping techniques	25%
	CO3	Understand parallel architecture and interconnection network	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3					√		√					

Course Details

Course Name:	Computer Architecture Lab
Course Code:	PCC-CS492
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	4th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Design pipelining concepts with a prior knowledge of stored program methods
CO2	Design about memory hierarchy and mapping techniques
CO3	Understand of parallel architecture and interconnection network

CO Attainment

		CO	Attainment
Computer Architecture Lab (PCC-CS492)	**CO1**	Design pipelining concepts with a prior knowledge of stored program methods	10%
	CO2	Design about memory hierarchy and mapping techniques	25%
	CO3	Understand of parallel architecture and interconnection network	25%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3					√		√					

Course Details

Course Name:	Formal Language & Automata
Course Code:	PCC-CS403
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	4th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Formulate a formal notation for strings, languages and machines.
CO2	Design finite automata to accept a set of strings of a language
CO3	For a given language understand whether the given language is regular or not.
CO4	Design context free grammars to generate strings of context free language.
CO5	Understand equivalence of languages accepted by Push Down Automata and languages generated by context free grammars
CO6	Analyze the hierarchy of formal languages, grammars and machines.
CO7	Recognize between computability and non-computability and Decidability and undecidability.

CO Attainment

		CO	Attainment
Formal Language & Automata PCC-CS403)	CO1	Formulate a formal notation for strings, languages and machines.	10%
	CO2	Design finite automata to accept a set of strings of a language	15%
	CO3	For a given language understand whether the given language is regular or not.	5%
	CO4	Design context free grammars to generate strings of context free language.	5%
	CO5	Understand equivalence of languages accepted by Push Down Automata and languages generated by context free grammars	10%
	CO6	Analyze the hierarchy of formal languages, grammars and machines.	10%
	CO7	Recognize between computability and non-computability and Decidability and undecidability.	5%

MappingofCourseOutcomesandProgramOutcomesforthesubject**Formal Language & Automata**

PCC-CS403

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2			✓	✓						✓		
CO3					✓		✓					
CO4			✓	✓						✓		
CO5					✓		✓					
CO6		✓										
CO7												✓

Course Details

Course Name:	DBMS
Course Code:	PCC-CS601
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	6th Semester

Course Outcome

On completion of the course students will be able to

1. Analyze a given query using relational algebra expressions and SQL for that query and optimize the developed expressions.

2. Design a given specification of the requirement design the databases using E R method and normalization.

3. Formulate a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.

4. Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.

CO Attainment

		CO	Attainment
DBMS	**CO1**	Analyze a given query using relational algebra expressions and SQL for that query and optimize the developed expressions.	20%
	CO2	Design a given specification of the requirement design the databases using E R method and normalization.	10%
	CO3	Formulate a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.	15%
	CO4	Implement the isolation property,	

		including locking, time stamping based on concurrency control and Serializability of scheduling.	14%

CO – PO Mapping

CourseOut comes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2			✓	✓						✓		
CO3		✓										
CO4				✓								

Course Details

Course Name:	DBMS LAB
Course Code:	PCC-CS691
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	6th Semester

COURSE OUTCOMES

1 Infer database language commands to create simple database.

2 Analyse the database using queries to retrieve records.

3 Applying PL/SQL for processing database.

4 Develop solutions using database concepts for real time requirements.

CO Attainment

		CO	Attainment
DBMS LAB	CO1	Understand HTML and Infer database language commands to create simple database.	10%
	CO2	Analyze the database using queries to retrieve records.	20%
	CO3	Applying PL/SQL for processing database.	15%
	CO4	Develop solutions using database concepts for real time requirements.	20%

CO – PO Mapping

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					✓		✓					
CO2		✓								✓		
CO3	✓				✓	✓					✓	
CO4							✓					

Course Details:

Course Name:	Computer Networks
Course Code:	PCC-CS602
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	6th Semester

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To develop an understanding of modern network s from a design and performance perspective.
CO2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)
CO3	To provide an opportunity to do network programming
CO4	To provide a WLAN measurement ideas.

CO Attainment

		CO	Attainment
Computer Networks (PCC-CS602)	CO1	To develop an understanding of modern network s from a design and performance perspective.	10%
	CO2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)	20%
	CO3	To provide an opportunity to do network programming	15%
	CO4	To provide a WLAN measurement ideas.	10%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√		√							
CO2	√	√			√							
CO3				√	√							
CO4				√	√							

Course Details:

Course Name:	
	ComputerNetworksLab
Course Code:	**PCC-CS692**
Name of the Program:	**B.Tech**
Department	**Computer Science Engineering**
Semester	**6th Semester**

COURSEOUTCOMES

Aftercompletionofcourse,studentswouldbeableto:

1. Identifyandusevariousnetworkingcomponents.
2. Analyzeperformance ofvariouscommunicationprotocols.
3. Understandthetransportlayerconceptsandprotocoldesignincludingconnectionorientedandconnection-less models.
4. Implementdevicesharingonnetwork.

COAttainmentofSubjects

Paper Code(Name)	CO Number	Course Outcomes(CO)	ATTAINED
ComputerNetworks Lab Code:PCC-CS692	CO1	Identify and understand of Various networking components.	10%
	CO2	Analyze the performance of Various communication protocols.	15%
	CO3	Understand the transport Layer concepts and Protocol design including Connection oriented and Connectionless models.	10%
	CO4	Implement device sharing On network.	20%

MappingofCourseOutcomesandProgramOutcomesforthesubjectComputerNetworkLab(PCC-CS692)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		1					1					
CO2		1		1								
CO3							1					
CO4				1								

perCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED
PROJ-CS601 Research Methodology	CO1	Identifyanddiscusstheissues andconcepts salienttotheresearch process.	15%
	CO2	Analysisofcomplex issuesinherentin selectingaresearch problem,selectingan appropriateresearch design,andimplementing aresearchproject.	20%
	CO3	Understand,compre hendand explainresearch articlesintheir academicdiscipline.	15%

MappingofCourseOutcomesandProgramOutcomesforthesubjectResearchMethodology(PROJ-CS601)

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓										
CO2		✓		✓								
CO3							✓					

COAttainment

		CO	Attainment
Design and Analysis of Algorithm Lab (PCC-CS494)	**CO1**	Design algorithm and implement C program using divide and conquer approach in Computer Science and Engineering and related fields.	15%
	CO2	Design algorithm and implement C program using dynamic programming in Computer Science and Engineering and related fields.	15%
	CO3	Design algorithm and implement C program using branch and bound method in Computer Science and Engineering and related fields. App	5%
	CO4	Design algorithm and implement C program using backtracking in Computer Science and Engineering and related fields.	5%
	CO5	Design algorithm and implement C program using greedy method in Computer Science and Engineering and related fields.	10%
	CO6	Design Graph Traversal Algorithm and implement C program in Computer Science and Engineering and related fields.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√						√		
CO2			√	√						√		
CO3			√	√						√		
CO4			√	√						√		
CO5			√	√						√		

Course Name:	Image Processing
Course Code:	PEC-IT601D
Name of the Program:	B.Tech
Department	Computer Science Engineering

Semester	6th Semester
Name of Faculty	Suman Halder

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Review the fundamental concepts of a digital image processing system.
CO2	Analyze images in the spatial and frequency domain using various transforms.
CO3	Evaluate the techniques for image enhancement and image restoration.
CO4	Interpret image segmentation and representation techniques.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√		√							
CO2	√	√			√							
CO3				√	√							
CO4				√	√							

Course Details

Course Name:	Pattern Recognition
Course Code:	PEC-IT602D
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	6th Semester
Name of Faculty	SD

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	Understand and compare a variety of pattern classification, structural pattern recognition and pattern classifier combination techniques.
CO2	Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.
CO3	Apply performance evaluation methods for pattern and critique comparisons of techniques made in the research literature.
CO4	Apply pattern recognition techniques to real-world problems such as document analysis and recognition.
CO5	Implement simple pattern classifiers, classifier combinations and structural pattern recognizers.
CO6	Able to manipulate Bayes' Classifier and implement Decision Trees.

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					√		√					
CO2		√		√								
CO3	√				√	√					√	
CO4	√				√	√					√	
CO5				√								

COAttainmentofSubjects

			CO	Attainment
Pattern Recognition PEC-IT602D	**CO1**		Understand and compare a variety of pattern classification, structural pattern recognition and pattern classifier combination techniques.	15%
	CO2		Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.	15%
	CO3		Apply performance evaluation methods for pattern and critique comparisons of techniques made in the research literature.	5%
	CO4		Apply pattern recognition techniques to real-world problems such as document analysis and recognition.	15%
	CO5		Implement simple pattern classifiers, classifier combinations and structural pattern recognizers.	10%
	CO6		Able to manipulate Bayes' Classifier and implement Decision Trees.	5%

CO Attainment of Human Resource Development and Organizational Behavior(OEC-IT601B)

Paper Code(Name)	CO Number	CourseOutcomes(CO)	ATTAINED
OEC-IT601B	CO1	Understand the organizational structures, the Features and principles of organization. Analysis of the theories of motivation ,and Applying the knowledge in the organizational Level and in different socio-environmental Legal situations.	15%

Human Resource Development and Organizational Behavior	CO2	Understand and recognize different leadership in different social situations. Analysis of concept of Group Dynamic be done to the Students for their proper understanding and to apply in real-life scenarios.	15%
	CO3	Recognize the factors of organizational Change and its impact on business, better Understanding of the business environment With respect to resistance to change and apply The knowledge of it in different problems.	25%

Mapping of CourseOutcomes and ProgramOutcomesfor thesubjectHumanResourceDevelopmentandOrganizationalBehavior(OEC-IT601B)

CourseOut comes	ProgramO utcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		✓		✓			✓					
CO2		✓		✓			✓					
CO3							✓					✓

Cryptography & Network Security (CS801D)

Course Outcomes:
CO1: To be able to identify common network security vulnerabilities/attacks; explain the foundations of Cryptography and network security.

CO2: To be able to analyze the risks and threats to networked computers.

CO3: To be able to demonstrate detailed knowledge of the role of encryption to protect data.

CO4: To be able to analyze security issues arising from the use of certain types of technologies.

CO5: To be able to identify the appropriate procedures required to secure networks, system security testing and procedures of Backup and Recovery.

Paper Code(Name)	CO Number	CourseOutcomes(CO)	ATTAINED
OEC-IT601B HumanResource Developmentand OrganizationalBehavior	CO1	To be able to identify common network security vulnerabilities/attacks; explain the foundations of Cryptography and network security.	25%
	CO2	To be able to analyze the risks and threats to networked computers.	25%
	CO3	To be able to demonstrate detailed knowledge of the role of encryption to protect data.	20%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2		√		√								
CO3	√	√				√	√					

CO4		√									

Course Details:

Course Name:	E-Commerce & ERP
Course Code:	OEC-CS802A
Name of the Program:	B.Tech
Department	Computer Science Engineering
Semester	8th Semester
Name of Faculty	SD

COURSE OUTCOME:

On successful completion of this course, students should be able to:

CO1	To identify and differentiate various types of Ecommerce.
CO2	To define and understand E-business and its Models.
CO3	To apply appropriate techniques and resources of Hardware and Software Technologies for Ecommerce.
CO4	To understand the basic concepts of ERP and identify different technologies used in ERP.
CO5	To apply different tools used in ER.

COAttainment

		CO	Attainment
E-Commerce & ERP OEC-CS802A	**CO1**	To identify and differentiate various types of Ecommerce.	10%
	CO2	To define and understand E-business and its Models.	15%
	CO3	To apply appropriate techniques and resources of Hardware and Software Technologies for Ecommerce.	10%
	CO4	To understand the basic concepts of ERP and identify different technologies used in ERP.	10%
	CO5	To apply different tools used in ER.	15%

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				√								
CO2					√		√					
CO3	√				√	√					√	
CO4					√		√					
CO5	√				√	√					√	

PaperCode (Name)	CO Number	Course Outcomes(CO)	ATTAINED
OEC-CS801E, Soft Skill &Interpersonal Communication	CO1	Understand the importance of Behavioral aspects in the workplace	10%
	CO2	Recognize the conflict resolution skills at work	17%
	CO3	Understand the importance of Communication skills in daily life And at work	25%

Mapping of Course Outcomes and Program Outcomes for the subject Soft Skill &Interpersonal Communication(OEC-CS801E)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							✓					
CO2												✓
CO3							✓					

PAPER NAME	CO No.	Course Outcomes	Attainment
BIOLOGY (BSC-401)	CO1	Describe how biological observations of 18th century lead to major discoveries and understand that the classification of organisms is based on morphological, biochemical or ecological	10%

		parameters.	
	CO2	Highlight the concepts of excessiveness and dominance during the passage of genetic material from parent to offspring.	24%
	CO3	Convey that all forms of life have the same building blocks and yet the manifestations are diverse.	5%
	CO4	Classify enzymes and distinguish between different mechanisms of enzyme action and identify DNA as a genetic material in the molecular basis of information transfer.	10%
	CO5	Analyze biological processes at the reductionist level and apply thermodynamic principals to the biological systems.	10%

Mapping of Course Outcomes and Program Outcomes for the subject BIOLOGY (BSC-401)

Course Outcomes	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1					✓		✓					
CO2				✓			✓					✓
CO3		✓										✓
CO4												✓
CO4		✓										

CO ATTAINMENT = 2020 ODD , 2021 EVEN

Paper Code (Name)	CO	COURSE OUTCOMES(COs)	ATTAINED (%)
		1ST SEMESTER	
BS-PH101 **Chemistry-I**	CO1	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces to solve different engineering problems.	83
	CO2	Rationalise bulk properties and processes using thermodynamic consideration for various engineering applications.	76
	CO3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	78
	CO4	Rationalise periodic properties (ionization potential, electro negativity, oxidation states) for various engineering applications.	79
	CO5	Apply the knowledge of structure, stability and reactivity of organic molecular species in order to gain a clear insight into the mechanism of chemical and biochemical reacting systems used in various engineering problems.	78
BS PH-101 **(Physics-I)**	CO1	Apply the knowledge of simple harmonic motion (ideal and real cases) and basic concepts of Mechanics for the solution of complex problems.	79
	CO2	Utilize the knowledge of vector calculus and different coordinate system for the solution of complex problems.	75
	CO3	Apply the knowledge of physical optics (interference, diffraction, polarization) and LASER to solve different complex problems	78
	CO4	Apply the knowledge of dielectric and magnetic properties of materials to interpret different complex systems.	77
	CO5	Utilize the knowledge of Quantum Physics to analyze a complex engineering problem.	78
	CO6	Apply the knowledge statistical mechanics to solve complex problems.	75
BS-M101/ BS-M102 **Mathematics –IA*/** **Mathematics –IB ***	CO1	Understand the properties of complex functions and their behavior. Know the techniques for evaluating complex integrals and series. Learn the theory of analytic functions, conformal mapping, the Cauchy-Riemann equations, concept of Taylor and Laurent series, complex integration, Liouville's theorem, residues and the Residue Theorem	75
	CO2	Understand the concept of a differential equation and its solution. Know the techniques for solving first-order and second-order differential equations,	87

		Cauchy-Euler differential equation, Bessel's equation, indicial equations, power-series solution.	
	CO3	Understand the concept of integration over two or three-dimensional regions/volumes. Know the techniques for evaluating double and triple integrals, including change of variables and polar, cylindrical, and spherical coordinates	89
	CO4	Understand the statement of Stokes' theorem, Green's theorem and how to apply it to compute line integrals. Understand the concept of a curve and its parameterization. Know the techniques for evaluating line integrals, including parametric and vector forms. Understand the concept of a surface and its parameterization. Know the techniques for evaluating surface integrals, including parametric and vector forms. Understand volume integrals and Gauss divergence theorem.	83
BS-PH191/ BS-CH191 Physics-I Laboratory (Gr-A)/ Chemistry-I Laboratory (Gr-B)	CO1	Organize/Design the experiment related to Chemical Science as applicable in various Engineering problems.	77
	CO2	Generate experimental Data related to Chemical Science as applicable in complex problems.	88
	CO3	Conduct actual experiment related to Chemical Science as applicable in different engineering application.	79
	CO4	Analyze data and draw conclusion related to Chemical Science as applicable in various engineering problems.	86
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to Chemical Science as applicable in different engineering fields.	87
BS PH-191 (Physics-Lab 1)	CO1	Organize/design the experiment related to various systems and interpret the physical properties of material.	85
	CO2	Generate experimental Data related to electrical and magnetic properties.	85
	CO3	Conduct actual experiment related to optical phenomena.	88
	CO4	Analyze data and draw conclusion related to quantum physics.	86
	CO5	Analyze with proper experimental data and graphs and communicate effectively.	87
ES-ME191/ ES-ME192 Engineering Graphics & Design (Gr-B)/ Workshop /Manufacturing Practices(Gr-A)	CO1	Introduction to engineering design and its place in society	84
	CO2	Exposure to the visual aspects of engineering design	86
	CO3	Exposure to engineering graphics standards	89
	CO4	Exposure to solid modelling	84

2ND SEMESTER

BS-CH201 Chemistry-I	**CO1**	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces to solve different engineering problems.	88
	CO2	Rationalise bulk properties and processes using thermodynamic consideration for various engineering applications.	86
	CO3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	88
	CO4	Rationalise periodic properties (ionization potential, electro negativity, oxidation states) for various engineering applications.	84
	CO5	Apply the knowledge of structure, stability and reactivity of organic molecular species in order to gain a clear insight into the mechanism of chemical and biochemical reacting systems used in various engineering problems.	82
BS PH-201 (Physics-I)	**CO1**	Apply the knowledge of simple harmonic motion (ideal and real cases) and basic concepts of Mechanics for the solution of complex problems.	85
	CO2	Utilize the knowledge of vector calculus and different coordinate system for the solution of complex problems.	88
	CO3	Apply the knowledge of physical optics (interference, diffraction, polarization) and LASER to solve different complex problems	73
	CO4	Apply the knowledge of dielectric and magnetic properties of materials to interpret different complex systems.	87
	CO5	Utilize the knowledge of Quantum Physics to analyze a complex engineering problem.	73
	CO6	Apply the knowledge statistical mechanics to solve complex problems.	79
BS-M201/ BS-M202 Mathematics –IIA# / Mathematics –IIB #	**CO1**	Understand the properties of complex functions and their behavior. Know the techniques for evaluating complex integrals and series. Learn the theory of analytic functions, conformal mapping, the Cauchy-Riemann equations, concept of Taylor and Laurent series, complex integration, Liouville's theorem, residues and the Residue Theorem.	83
	CO2	Understand the concept of a differential equation and its solution. Know the techniques for solving first-order and second-order differential equations, Cauchy-Euler differential equation, Bessel's equation, indicial equations, power-series solution.	90
	CO3	Understand the concept of integration over two or three-dimensional regions/volumes. Know the techniques for evaluating double and triple integrals, including change of variables and polar, cylindrical, and spherical coordinates	83

	CO4	Understand the statement of Stokes' theorem, Green's theorem and how to apply it to compute line integrals. Understand the concept of a curve and its parameterization. Know the techniques for evaluating line integrals, including parametric and vector forms. Understand the concept of a surface and its parameterization. Know the techniques for evaluating surface integrals, including parametric and vector forms. Understand volume integrals and Gauss divergence theorem.	80
HM-HU201 English	CO1	to be able to **use** the correct vocabulary in order to express oneself in English properly	82
	CO2	to be able to **identify** common errors in terms of grammar and choice of words in English	88
	CO3	to be able to **describe**, **discuss**, and **interpret** reading input in English	85
	CO4	to be able to **demonstrate** that one can express oneself in English through writing	84
BS-PH291/ BS-CH291 Physics-I Laboratory(Gr B)/ Chemistry-I Lab(GrA)	CO1	Organize/Design the experiment related to Chemical Science as applicable in various Engineering problems.	82
	CO2	Generate experimental Data related to Chemical Science as applicable in complex problems.	88
	CO3	Conduct actual experiment related to Chemical Science as applicable in different engineering application.	87
	CO4	Analyze data and draw conclusion related to Chemical Science as applicable in various engineering problems.	84
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to Chemical Science as applicable in different engineering fields.	84
BS PH-291 (Physics-Lab 1)	CO1	Organize/design the experiment related to various systems and interpret the physical properties of material.	86
	CO2	Generate experimental Data related to electrical and magnetic properties.	85
	CO3	Conduct actual experiment related to optical phenomena.	85
	CO4	Analyze data and draw conclusion related to quantum physics.	78
	CO5	Analyze with proper experimental data and graphs and communicate effectively.	79
ES-ME291/ ES-ME292 Engineering Graphics & Design(Gr-A)/ Workshop/Manufact uring Practices(GrB)	CO1	Introduction to engineering design and its place in society•	95
	CO2	Exposure to the visual aspects of engineering design	95
	CO3	Exposure to engineering graphics standards	95
	CO4	Exposure to solid modelling	95
HU291 Language	CO1	to be able to **describe, discuss**, and **interpret** the listening input in English	75

Laboratory	**CO2**	to be able to **demonstrate** that one can express oneself in English through speaking	84
	CO3	to be able to **describe, discuss,** and **interpret** reading input in English	87
	CO4	to be able to **demonstrate** that one can express oneself in English through writing	87

3RD SEMESTER

CE(ES)302 **Energy Science**	**CO1**	Understanding the various sources of energy and its interaction with the environment	77
	CO2	Designing energy efficient structures	87
CE(HS)302 – **INTRODUCTION TO CIVIL ENGINEERING**	**CO1**	= To acquire knowledge about basic civil engineering techniques and apply the acquired knowledge in basic civil engineering problems..	87
CE(ES)392 **Computer aided Civil Engineering Drawing**	**CO1**	To understand the concept of engineering drawings and apply the same using computer aided design technology	86

4TH SEMESTER

CE(ES)401 **Introduction to Fluid Mechanics**	**CO1**	To understand about the properties and characteristics of fluid	90.3
	CO2	To understand, analyze and evaluate the different characteristics, pattern and types of fluid flow and hydraulic machines.	90.2
CE(ES)40 Introduction to Solid Mechanics	**CO1**	Deterministic approaches for understanding interaction between material characteristic with load and time	83.9
	CO2	Knowledge about materials and structures and understand their deformation under load and Mathematical representation of the	86.6

		structure property	
CE(PC)401- **Soil Mechanics** – I	**CO1**	To understand, evaluate and gather knowledge about physical properties of soil and analyze the soil-water interaction system.	84.3
	CO2	To understand and analyze the stress distribution and shear strength characteristics of soils.	82.3
CE(PC)402- Environmental engineering -I	**CO1**	Analyzing the sources, requirements, quality and treatment of water and design of the patterns of conveyance and distribution	85.2
	CO2	Analyzing the characteristics of municipal solid waste and it's handling by engineering systems.	87.4
CE(PC)403- Surveying and Geomatics	**CO1**	To understand the basic principles of surveying and geomatics	86.4
	CO2	To evaluate the different techniques of surveying and geomatics in solving basic problems and also analyze different and advanced technique of surveying	82.2
CE(PC)404- **CONCRETE TECHNOLO GY**	**CO1**	Understanding the properties , raw materials required for designing fresh and hardened concrete	82
	CO2	Analysing the mix design of concrete	81
CE(HS)401- CE-SOCIETAL and global impact	**CO1**	Understanding the historical perspectives in the overall development of civil engineering	82.5
	CO2	Understanding the challenges of future civil engineering projects	72.8
CE(ES)491- FLUID LABORATORY	**CO1**	Apply the knowledge of fluid characteristics for determination of various parameters related to fluid flow through experimentation.	74.4
CE(ES)492-	**CO1**	Apply the knowledge of material characteristics to determine various	84

SOLID MECHANICS LABORATORY		strength parameters through experimentation.	
CE(ES)493- ENGGINEERING GEOLOGY LABORATORY	**CO1**	Apply the knowledge of Engineering Geology in determining the physical properties of rocks and minerals and to understand and delineate different geological structures by the interpretation of geological maps	85.4
CE(PC)493- SURVEYING AND GEOMATICS LABORATORY	**CO1**	Application of the knowledge of surveying and geomatics for determination of different methods of surveying for measurement	86.3
CE(PC)494-CONC LAB	**CO1**	Applying the knowledge of Concrete technology in determining the various parameters of Concrete and its design.	83.5

5TH SEMESTER

CE(PC)501- DESIGN OF RC STRUCTURES	**CO1**	To understand about the concept of limit state and working stress method of design.	75.4
	CO2	To understand, analyze and evaluate about the design of different types of RC structures by Limit State Method and Working Stress Method.	75.2
CE(PC)502 ENGINEERING HYDROLOGY	**CO1**	Understanding the basic concepts of Hydrology.	87.1
	CO2	Analysis of different hydrological parameters and mitigation methods of floods and flood management.	88.8
CE(PC)503-structURAL	**CO1**	Knowledge of static , determinate and indeterminate structures	85.1

ANALYSIS -I	**CO2**	Analysis of all type of structure of its stability and instability	86.8
CE(PC)504-SOIL MECHANICS - 2	**CO1**	To understand, evaluate and analyze about consolidation, compaction and earth pressures of soil.	75.
	CO2	To understand, analyze, evaluate the bearing capacity and settlement analysis of shallow foundation and slope stability analysis of any manmade or natural slope.	82.7
CE(PC)505-ENVIRONMENTAL ENGINEERING 2	**CO1**	**Define the basic concepts and terminologies of waste water engineering, hazardous waste management, Plumbing systems for water supply and waste water disposal**	80.3
	CO2	Apply the methods of quantifying sanitary sewage and storm sewage, solve mathematical problems and design different processes operations involved in waste water treatment.	80
CE(PC)506-TRANSPORTATION ENGINEERING	**CO1**	TO UNDERSTAND THE KNOWLEDGE OF PLANNING,DESIGN AND THE FUNDAMENTAL PROPERTIES OF HIGHWAY MATERIALS IN HIGHWAY ENGINEERING	84.2
	CO2	APPLY AND INTERPRET THE KNOWLEDGE OF GEOMETRIC DESIGN AND TRAFFIC STUDIES	83.4
CE(PC)591-RC DESIGN SESSIONAL	**CO1**	Apply the knowledge of RCC structure.	76.7
CE(PC)594-SOIL MECHANICS LABORATORY	**CO1**	Understand every aspect of soil investigation and prepare a lab report	94.8
CE(PC)595-ENVIRONMENTAL ENGINEERING LABORATORY	**CO1**	Organize/Design the experiment related to Digital Signal Processing Lab.	83.1

CE(PC)596-TRANSPORTATION LABORATORY	**CO1**	TO understand the application of different laboratory tests.	87.4
CE(PC)597-COMPUTER APPLICATION IN CIVIL ENGINEERING	**CO1**	Understanding Computer applications to apply in civil engineering field	92.06

6TH SEMESTER

CE(PC)601-CONSTRUCTION ENGINEERING AND MANAGEMENT	**CO1**	To Understand how structures are built.	89
	CO2	To evaluate the necessary steps for the completion of a project from the beginning to the end.	87
CE(PC)602-ENGINEERING ECONOMICS,ESTIMATION AND COSTING	**CO1**	To understand the principles of economics and it's application on value analysis of civil engineering projects	84.7
	CO2	To understand the technical specifications of rate analysis, Tender and valuation performed for a project and analyse the cost of a structure through these parameters.	82.4
CE(PC)603-WATER RESOURCE ENGINEERING	**CO1**	To apply the fundamentals of flow in open channel to design them accordingly	84.17
	CO2	To understand the different concepts of Irrigation in connection with the water requirement for different crops and obtain knowledge about various ground water resources	82.37

CE(PC)604- DESIGN OF STEEL STRUCTURES	**CO1**	Understanding the properties and its utility in civil engineering design	87
	CO2	Analysis of the use of steel in designing various structures	87
CE(PE)601B- FOUNDATION ENGINEERING	**CO1**	Gain basic knowledge about the bearing capacity of shallow and deep foundation at site and gain some knowledge about soil investigation and exploration	74.2
	CO2	Analyse the design of sheet pile structure on the basis of earth pressure theories and understand and apply various types of ground improvement methods for solving complex geotechnical problems	74
CE(PE)602A- BUILDING,CONSTRUCTION AND PRACTICE	**CO1**	Understand the knowledge of various structures that used in civil engineering construction	76
CE(PC)693-Water Resource Laboratory	**CO1**	To apply different techniques for proper use of water as an useful resource.	76
CE(PC)694-STEEL STRUCTURE DESIGN SESSIONAL	**CO1**	Apply the knowledge of steel structure in design	78
CE(PC)695-QUANTITY SURVEYESTIMATION AND VALUATION SESSIONAL	**CO1**	To evaluate about the specification and valuation of works and materials used in any civil engineering construction project	75

			7TH SEMESTER	
CE(OE)701A- METRO SYSTEM AND ENGINEERING	CO1	understand the overview of how the metro system works		76.9
	CO2	to apply the knowledge of different metro sysytem engineeirng works		78.5
CE(PE)701C- HYDRAULIC STRUCTURES	CO1	To understand and evaluate about the characteristics of various types and components of dams and their selection procedure.		78.8
	CO2	To analyze about the stability analysis of different hydraulic structures (dam) and estimate about different types of forces, seepage loss and discharge calculation acting on dams and their remedial measures .		84.1
CE(PE)702A- PRESTRESS CONCRETE	CO1	Understanding the purpose, parameters and application of Prestressed Concrete structure		84.3
	CO2	Design of Prestressed Concrete Structures		88.4
CE(PE)703A- AIR AND NOISE POLLUTION	CO1	Understanding the concepts of air and noise pollution, methods of their measurement.		83
	CO2	Analyze the concepts of air and noise pollution solving mathematical problems and design techniques for air and noise pollution control		82.6
CE(PE)704C-COASTAL HYDRAULICS AND SEDIMENT TRANSPORT	CO1	Understanding the various mechanisms involved in generation of tides, currents and waves and its implications on sediment transport.		85.6
	CO2	Applying the knowledge of wave current mechanics and sediment transport in analyzing different shore line and coastal structures		88.26
CE(PE)705A- RAILWAY AND AIRPORT ENGINEERING	CO1	to acquire the knowledge of basic railway engineering		83.2
	CO2	to acquire the knowledge of basic airport engineering.		76.13

8TH SEMESTER

CE(PE)801D PAVEMENT MATERIALS	**CO1**	To understand about the different materials for suitability of road and their availability characteristics.	76.6
	CO2	To understand and evaluate the properties of soil and physical modification of pavement works	77.3
CE(0E)801C DEEP FOUNDATION	**CO1**	To understand, evaluate and analyze about the selection of suitable type of deep foundation for various site conditions.	67.56
	CO2	To understand, analyze and evaluate the concept about bearing capacity of different types of deep foundations.	87

Paper Code (Name)	CO	COURSE OUTCOMES(COs)	ATTAINED (%)
		3RD SEMESTER	
EC301 (Electronic Devices) SS	CO1	Differentiate the conduction techniques in semiconductor materials	64%
	CO2	Analyze characteristics of semiconductor diodes, bipolar transistors, Mos-Transistors and solve problems.	64%
	CO3	Differentiate between different Opto-electronic devices	64%
EC302 (Digital System Design) PB	CO1	Convert various number system and apply logic gates, Boolean algebra and K-Map to design digital circuits.	57%
	CO2	Design the digital combinational circuits likes decoders, encoders, multiplexers amd de-multiplexers, half adder, full adder and compare their performance to optimize production cost and also develop sequential digital circuits like flip-flop, register, counter to design memory device.	57%
	CO3	Illustrate the knowledge of ROM,RAM,PROM,PLD,FPGA,TTL,CMOS and ECL apply them to design VLSI system.	57%
EC303 (Signals & Systems) SGH	CO1	Analyze different types of signals.	58%
	CO2	Represent continuous and discrete systems in time and frequency domain using different transforms.	58%
	CO3	Investigate whether the system is stable.	58%
	CO4	Sampling and reconstruction of a signal.	58%
EC304 Network Theory SAS	CO1	**Apply** all the electrical network theories and the concept of resonance to typical electric circuits with AC & DC sources to solve problems related to electronics & Communication Engineering	60%
	CO2	**Apply** Laplace transform technique to **analyze** complex electrical circuits in s domain and solve for voltage & current values related to electronics & communication Engineering.	60%
	CO3	**Apply** the knowledge of any set of two-port parameters for circuit analysis, & measurement of different parameters and convert one set of two-port parameters to another.	60%
ES-CS301	CO1	Implementation of different data structures efficiently.	70%

Data Structure & Algorithm (ES) **ABh**	**CO2**	Usage of well-organized data structures to handle large amount of data.	70%
	CO3	Usage of appropriate data structures for problem solving.	70%
BS-M301 **Probability & Statistics(BS)** **AS**	**CO1**	The students will learn: The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.	52%
	CO2	The basic ideas of statistics including measures of central tendency, correlation and	52%
	CO3	The statistical methods of studying data samples.	52%
EC391 **Electronic Devices Lab.)** **SS+SK**	**CO1**	Organize/Design the experiment related to **Solid State Device Lab.**	81%
	CO2	Generate experimental Data related to **Solid State Device Lab.**	81%
	CO3	Conduct actual experiment related to **Solid State Device Lab.**	81%
	CO4	Analyze data and draw conclusion related to **Solid State Device Lab.**	81%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Solid State Device Lab.**	81%
EC392 **Digital System Design** **PB+SM**	**CO1**	Organize/Design the experiment related to **Digital System Design Lab.**	88%
	CO2	Generate experimental Data related to **Digital System Design Lab.**	88%
	CO3	Conduct actual experiment related to **Digital System Design Lab.**	88%
	CO4	Analyze data and draw conclusion related to **Digital System Design Lab.**	88%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Digital System Design Lab.**	88%
ESCS391 **Data Structure Lab** **A. Mullick**	**CO1**	Design and develop programs using data structure & algorithm concepts.	88%
	CO2	Develop simple applications using linear and non-linear data structures & algorithms concepts and understand the access mechanisms and other use and functionalities.	88%
	CO3	Implement searching and sorting concepts for problem solving.	88%
	CO4	Implement the concepts of graph and hashing concepts for problem solving.	88%

4ᵀᴴ SEMESTER

EC401 **Analog** **Communication** **JA**	**CO1**	Design system components for amplitude modulation techniques that meet the specified needs with appropriate consideration relevant to complex analog communication systems	93%
	CO2	Analyze system components and calculate the corresponding values for nonlinear communication systems that meet the specified needs with appropriate consideration relevant to complex analog communication systems.	93%
	CO3	Analyze a stereo and a multiplexed system as applied to audio, analog or digital communication respectively.	93%
	CO4	Analyze noise parameters and compare signal to noise ratio for analog modulation techniques reaching substantiated conclusions on the performance of analog communication systems.	93%
EC402 **Analog Electronic** **Circuits** **PB**	**CO1**	Understand the characteristics of diodes and transistors and design and analyse various rectifier and amplifier circuit.	79%
	CO2	Understand the functioning of OP-AMP and design OP-AMP based circuits, Oscillators and multivibrators.	79%
EC403 **Microprocessor &** **Microcontrollers**	**CO1**	Students will be able to do assembly language programming using 8085/8086 and interfacing design of peripherals like I/O, A/D, D/A, Timer etc.	79%
	CO2	Students will be able to distinguish and analyze the properties of microcontroller	79%
ESCS401 **Design and Analysis** **of Algorithm** **Tathagata Ch**	**CO1**	To analyze and identify the Complexity of a problem and compute the recurrence relation.	93%
	CO2	To analyze the several algorithms design techniques on some certain problems using divide & conquer method, dynamic programming approach, backtracking, greedy method.	93%
	CO3	To understand lower bound theory, graph traversal algorithm, network flow, disjoint set manipulation different method.	93%
	CO4	To design the algorithm of string matching problem, matrix manipulation algorithm.	93%
	CO5	To understand amortize analysis, approximation algorithm, notion of NP-completeness.	93%

BS M401 Numerical Methods SPal	**CO1**	To develop thorough understanding of the mathematical concepts and theories that underlie numerical methods. This includes topics such as interpolation, differentiation, integration, and linear algebra.	74%
	CO2	Students should be able to analyse a given engineering problem and choose the appropriate numerical method to solve it. This requires an understanding of the strengths and limitations of various numerical techniques.	74%
	CO3	Students should be able to write computer programs to implement numerical algorithms. This includes an understanding of programming languages such as MATLAB, Python, or C++.	74%
	CO4	Students should understand the concept of numerical error and the sources of error in numerical calculations. They should be able to perform error analysis and make appropriate adjustments to improve the accuracy of their numerical solutions.	74%
BS B401 Biology for Engineer Ananya	**CO1**	After studying the course, the student will be able to: Describe how biological observations of 18th Century that lead to major discoveries and Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological	88%
	CO2	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine	88%
	CO3	Classify enzymes and distinguish between different mechanisms of enzyme action. Identify DNA as a genetic material in the molecular basis of information transfer.	88%
	CO4	Analyse biological processes at the reductionistic level Apply thermodynamic principles to biological systems.	88%
	CO5	Identify and classify microorganisms.	88%
EC491 Analog Communication Lab JA,SAS,RM,SM	**CO1**	Organize/Design the experiment related to **Analog Communication Lab.**	81.25%
	CO2	Generate experimental Data related to **Analog Communication Lab.**	81.30%
	CO3	Conduct actual experiment related to **Analog Communication Lab.**	82.22%
	CO4	Analyze data and draw conclusion related to **Analog Communication Lab.**	81.48%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Analog Communication Lab.**	81.85%

EC492 **Analog Electronic** **Circuit** **PB,SK,JR**	**CO1**	Organize/Design the experiment related to **Analog Electronic Circuit Lab.**	88%
	CO2	Generate experimental Data related to **Analog Electronic Circuit Lab.**	88%
	CO3	Conduct actual experiment related to **Analog Electronic Circuit Lab.**	88%
	CO4	Analyze data and draw conclusion related to **Analog Electronic Circuit Lab.**	88%
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to **Analog Electronic Circuit Lab.**	88%
EC493 **Microprocessor &** **Microcontroller Lab** **SS,TS,JR**	**CO1**	The knowledge of basic microcomputer system and the architecture as well as assembly language programming of 8085 microprocessor to solve engineering problems related to design system based on these processors in ECE.	93%
	CO2	The knowledge of architecture and assembly language programming of 8051 microcontroller and the architecture of PIC to solve engineering problems related to design system based on these processors in ECE	93%
	CO3	The knowledge of architecture and assembly language programming of 8086 microprocessor to solve engineering problems related to design system based on these processors in ECE.	93%
	CO4	The knowledge of memory and peripheral interfacing devices to solve engineering problems related to design of I/O and memory interfacing of microprocessor and microcontroller based system in ECE.	93%
BS-M(CS)491 **Numerical Method** **Lab.** **SPAL**	**CO1**	Students would develop deep understanding of numerical algorithms, including interpolation, differentiation, integration, and linear algebra, and how these algorithms can be implemented in C.	75%
	CO2	Students would be able to write computer programs in C to implement numerical algorithms. This requires an understanding of the syntax and features of C programming language.	75%
	CO3	Students would develop an understanding of programming concepts such as data structures, control structures, functions, and file handling in C, and how these concepts can be used to implement numerical algorithms.	75%
	CO4	Students would be able to identify and fix errors in C programs, including runtime errors, syntax errors, and logical errors. They should also understand the importance of error handling in numerical computations.	75%

5TH SEMESTER

EC501 **Electromagnetic**	**CO1**	Understand the basic mathematical concepts related to electromagnetic vector fields.	73%

Waves **Anupa Chatterjee** **Swagata Bankura**	**CO2**	Characterize uniform plane wave and calculate reflection and transmission of waves at media interface.	73%
	CO3	Understand characteristics and wave propagation on high frequency transmission lines, carryout impedance transformation on transmission line and use sections of transmission line sections for realizing circuit elements.	73%
	CO4	Analyze wave propagation on metallic waveguides in modal form.	73%
	CO5	Understand principle of radiation and radiation characteristics of an antenna.	73%
EC502 **Computer** **Architecture** **Subhasree Maity**	**CO1**	learn how computers work and know basic principles of computer's Working procedure.	70%
	CO2	Analyze the performance of computers.	70%
	CO3	Know how computers are designed and built.	70%
	CO4	Understand issues affecting modern processors (caches, pipelines etc.)	70%
EC503 **Digital Communication** **& Stochastic** **Process** **JA**	**CO1**	Apply the fundamental knowledge of probability theory and random processes for the solution of complex engineering problems related to digital communication techniques.	64%
	CO2	Analyze signal and system parameters using the methods of vector algebra reaching substantiated conclusions on digital communication techniques.	64%
	CO3	Design solution for baseband transmission techniques as applicable to digital communication	64%
	CO4	Design solution for digital carrier modulation techniques as applicable to electronics and Communication Engineering	64%
EC504 **Digital Signal** **Processing** **SAS**	**CO1**	Appling sampling theorem students can able to **construct/convert** continuous time signal/analog into digital sequence and gain the **knowledge** from time to frequency domain conversion like DTFT,DFT.	68%
	CO2	Student can able to **design** and **implement** different types of digital filters(both FIR and IIR) from analog prototype filter using the knowledge of filter transformation(Likely Impulse invariant and Bilinear transform) in different form such as direct form-I, form-II, cascade and parallel etc.	68%
	CO3	They can able to **process** digital signals and can also **design** Digital system/Digital signal Processor by setting proper Algorithm onto FPGA and writing Assembly level program.	68%
PEEC505A **Program Elective1** **Nano Electronics** **RB**	**CO1**	Understand various aspects of nano-technology and the processes involved in making nano components and material and appropriate use in solving practical problems	68%
	CO2	Appropriate use of different nano-technology for life-long learning.	68%

OEEC506 A Soft Skill & Interpersonal Communication NMR	**CO1**	to be able to **interpret** the importance of proximal and distal goals in the workplace	68%
	CO2	to be able to **demonstrate** conflict resolution skills at work	68%
	CO3	to be able to **understand** the importance of communication skills in daily life and at work	68%
EC591 Electromagnetic Wave Lab AC,SB,RM	**CO1**	Understand the basic mathematical concepts related to electromagnetic vector fields.	83%
	CO2	Characterize uniform plane wave and calculate reflection and transmission of waves at media interface.	83%
	CO3	Understand characteristics and wave propagation on high frequency transmission lines, carryout impedance transformation on transmission line and use sections of transmission line sections for realizing circuit elements.	83%
	CO4	Analyze wave propagation on metallic waveguides in modal form.	83%
	CO5	Understand principle of radiation and radiation characteristics of an antenna.	83%
EC592 Digital Communication Lab JA,RM,TS	**CO1**	Apply the fundamental knowledge of probability theory and random processes for the solution of complex engineering problems related to digital communication techniques.	94%
	CO2	Analyze signal and system parameters using the methods of vector algebra reaching substantiated conclusions on digital communication techniques.	94%
	CO3	Design solution for baseband transmission techniques as applicable to digital communication	94%
	CO4	Design solution for digital carrier modulation techniques as applicable to electronics and Communication Engineering	94%
	CO5		
EC593 Digital Signal Processing Lab. MSG, TS	**CO1**	**Organize/Design** the experiment related to **Digital Signal Processing Lab.**	88%
	CO2	**Generate** experimental Data related to **Digital Signal Processing Lab.**	88%
	CO3	**Conduct** actual experiment related to **Digital Signal Processing Lab.**	88%
	CO4	**Analyze** data and draw conclusion related to **Digital Signal Processing Lab.**	88%
	CO5	**Analyze** with proper experimental data and graphs and communicate effectively related to **Digital Signal Processing Lab.**	88%

6TH SEMESTER

EC601 **Control System &** **Instrumentation** **MSG**	**CO1**	**Characterize** a system and find its steady state behavior.	85%
	CO2	**Investigate** stability of a system using different test related to control system.	80%
EC602 **Computer Network** **AC**	**CO1**	Familarization with the fundamental knowledge of data communication and networks and **apply** this knowledge to **investigate** the error in the communication network and **analyze** the errors using different error correcting codes.	85%
	CO2	**Analyze** the internetworking devices and **investigate** different addressing and subnetting protocols to **investigate** proper process to process delivery.	60%
PEEC603D **Information Theory** **& Coding** **RB**	**CO1**	Recognize the notion of information in the quantitative sense to measure the quantity of information for transmission of data and apply this basic knowledge to calculate channel capacity and probability distribution for real time transmission systems.	65%
	CO2	Assess the fundamental coding theorem for encoding and decoding the information and develop the different techniques for construction of error correction codes .	63%
	CO3	Evaluate the rate and error probabilities in different coding techniques to implement the cost effective system.	62%
EC692 **Computer Network** **Lab** **AC,SK,RM**	**CO1**	Understand the basic concept related to NIC installation and configuration. Apply the knowledge of IPC message queue.	95%
	CO2	Remembering and understanding the networking cables, switches, hubs and connectors.	95%
	CO3	Understand multicast and broadcast socket and analyze TCP/UDP socket programming.	95%
	CO4	Applying the knowledge of socket programming, analyze prototype multithreaded server.	95%
	CO5	Understand the knowledge of data link layer flow control mechanism and apply this knowledge for the error control.	95%
EC691 **Control System &** **Instrumentation Lab.** **MSG,TS,SM**	**CO1**	**Characterize** a system and investigate stability of the system in time and frequency domain with different method related to Control and Instrumentation Lab	90%
	CO2	**Design** various controllers related to Control and Instrumentation Lab	90%
	CO3	**Conduct** experimental set up with CRO ,Instrumentation Amplifier knowing their functional details related to Control and Instrumentation Lab	85%
EC681 **Electronic Design** **RB, SGH, SK, TS**	**CO1**	Formulation of a problem statement either from rigorous literature survey or from the requirements raised need to be analysed.	90%
	CO2	Design, implement and test the photo type/algorithm in order to solve the problem statement.	90%
	CO3	Write comprehensive report on Mini Project work.	80%
7TH SEMESTER			
EC701	**CO1**	Visualize the architecture of satellite systems as a means of high speed, high range communication system.	68%

Course	CO	Description	%
Satellite Communication **TK**	**CO2**	State various aspects related to satellite systems such as orbital equations, sub-systems in a satellite, link budget, modulation and multiple access schemes.	68%
	CO3	Solve numerical problems related to orbital motion and design of link budget for the given parameters and conditions.	68%
EC702C **Nural Network and** **Fuzzy Logic Control** **SGH**	**CO1**	Analyze and classify neural networks and its implementation algorithms.	71%
	CO2	Apply suitable algorithms on different cases.	71%
	CO3	Apply fuzzy logic and neural networks.	71%
	CO4	Analyze the applications of Neural Network and Fuzzy logic in image processing.	71%
EC703A **Embedded System** **MSG**	**CO1**	Understand the internal structure, purpose and application of Embedded system.	69%
	CO2	Apply the concept of Embedded firmware in design of Embedded System.	69%
OEEC704A **Web Technology** **SM**	**CO1**	design good web pages using different tags, tables, forms, frames and style sheets supported by HTML and implement, compile, test and run Java programs, comprising more than one class, to address a particular software problem.	72%
	CO2	demonstrate the ability to employ various types of selection statements and iteration statements in a Java program.	72%
	CO3	be able to leverage the object-oriented features of Java language using abstract class and interface.	72%
	CO4	be able to handle errors in the program using exception handling techniques of Java.	72%
EC781 **Industrial Training** **& Project** **SSil**	**CO1**	Apply knowledge(fundamental & specialized) to understand the real life problem in the related field.	**95%**
	CO2	Understand the design and implementation aspects of engineering system/components.	**95%**
	CO3	Work individually and also in a group.	**95%**
	CO4	Communicate the details of training through Training Report, Presentation and Viva-Voce.	**95%**
	CO5	Understand implication of engineering solutions in social and environmental perspective.	**95%**
EC782 **Project Stage 1** **SSil**	**CO1**	Formulate the problem.	**95%**
	CO2	Develop or design a solution of the problem.	**95%**
	CO3	Build up project prototype or model in hardware or software.	**95%**

	CO4	Analyze the experimental/collected data.	**95%**
	CO5	Do investigation/research in the problem area.	**95%**
	CO6	Apply fundamental and specialize knowledge in the area of the problem.	**95%**
	CO7	Self learn new methods, tools and techniques.	**95%**
	CO8	Apply modern tools and techniques.	**95%**
	CO9	Work individually and also in team.	**95%**
	CO10	Communicate the details and findings of the project through project report, presentation, Viva-Voce and paper presentation , if any.	**95%**
	CO11	Apply project management and economic knowledge	**95%**
	CO12	Identify implications of the project in society and environment.	**95%**

8TH SEMESTER

PEEC 801B **Fibre Optics** **Communication** **SAS**	CO1	**Learn** the properties of light in different medium and **utilize** the knowledge in different types of fibres for optical fibre communication system, and also the corresponding losses of each kinds of fibres.	89%
	CO2	**Learn** the working of all types of optical source and detectors for signal modulation and demodulation respectively.	89%
PEEC802A	CO1	Understand the practical situations where mixed signal analysis is required.	87%
	CO2	Analyze and handle the inter-conversions between signals.	87%
	CO3	Design systems involving mixed signals.	87%
OEEC803C **Cyber Security** **Abhijit Mitra**	CO1	To analyze and evaluate the cyber security needs of an organization.	86%
	CO2	To analyze software vulnerabilities and security solutions to reduce the risk of exploitation.	86%
	CO3	To comprehend and execute risk management processes, risk treatment methods and performance indicators.	86%
EC881 **Project II** **SSIL**	CO1	Formulate the problem.	95%
	CO2	Develop or design a solution of the problem.	95%
	CO3	Build up project prototype or model in hardware or software.	95%
	CO4	Analyze the experimental/collected data.	95%

	CO5	Do investigation/research in the problem area.	95%
	CO6	Apply fundamental and specialize knowledge in the area of the problem.	95%
	CO7	Self learn new methods, tools and techniques.	95%
	CO8	Apply modern tools and techniques.	95%
	CO9	Work individually and also in team.	95%
	CO10	Communicate the details and findings of the project through project report, presentation, Viva-Voce and paper presentation , if any.	95%
	CO11	Apply project management and economic knowledge	95%
	CO12	Identify implications of the project in society and environment.	95%
EC882 **Grand Viva** **SSIL**	CO1	. Demonstrate the capability to formulate the problem.	94%
	CO2	Demonstrate the capability to develop or design a solution of the problem.	94%
	CO3	Demonstrate the capability to build up project prototype or model in hardware or software.	94%
	CO4	Demonstrate the capability to analyze the experimental/collected data.	94%
	CO5	Show the capability to demonstrate the research based knowledge	94%
	CO6	Demonstrate the capability to apply fundamental and specialize knowledge in the area of the problem.	94%
	CO7	Demonstrate the capability for self learning new methods, tools and techniques.	94%
	CO8	Demonstrate the capability to apply modern tools and techniques.	94%
	CO9	Demonstrate the capability to work individually and also in team.	94%
	CO10	Demonstrate the capability to communicate in details and present a topic related to Electronics & Communication Engineering.	94%

DEPARTMENT OF ELECTRICL ENGINEERING
CALCUTTA INSTITUTE OF ENGINEERING AND MANGEMENT

Program Outcomes

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Course Outcomes

PROGRAM OUTCOMES

PO NO.	BROAD HEADING	ELABORATE MEANING
1	**Engineering knowledge**	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialisation for the solution of complex engineering problems.
2	**Problem analysis:**	Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	**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 public health and safety, and cultural, societal, and environmental considerations.
4	**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.
5	**Modern tool usage:**	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling to complex engineering activities, with an understanding of the limitations.
6	**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.
7	**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.
8	**Ethics:**	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	**Individual and team work:**	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	**Communication:**	Communicate effectively on complex engineering activities with the engineering community and with t h e 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.

| 11 | **Project management and finance:** | Demonstrate knowledge and understanding of t h e 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 |
| 12 | **Life-long learning:** | Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. |

PROGRAM SPECIFIC OUTCOMES

PSO1: Ability to apply the knowledge of Basic Computing, Basic Sciences and Social Sciences in the field of electrical engineering to identify, analyze and solve real life problems faced in industries and/or during research work.

PSO2: Ability to model, test, analyze and design components or processes related to modern power system involving both conventional and renewable energy resources, high voltage systems and energy management.

PSO3: Ability to apply the concept of circuit theory, electromagnetic field theory and basic electronics to solve complex problems of electrical machines and drives, power   electronic converters and electrical system design.

PSO4: Ability to identify and analyze the role of measurement, instrumentation and modern control engineering to enhance sustainability, reliability and efficiency of electrical systems.

PSO5: Ability to demonstrate proficiency in operating and handling modern engineering tools to cop up with dynamic industrial environment.

PSO6: Ability to work and communicate effectively in the corporate life keeping a responsible outlook towards socio-economic and environmental issues.

COURSE OUTCOMES

Name of the Subject: ELECTRIC CIRCUIT THEORY	
Subject Code: : PC-EE 301	
Year: 2nd (New Syllabus)	**Semester:** 3rd
Course Outcomes:	1. describe different type of networks, sources and signals with examples. 2. explain different network theorems, coupled circuit and tools for solution of networks. 3. apply network theorems and different tools to solve network problems. 4. select suitable techniques of network analysis for efficient solution. 5. estimate parameters of two-port networks. 6. design filter circuits.

Name of the Subject: ANALOG ELECTRONICS	
Subject Code: PC-EE 302	
Year: 2nd (New Syllabus)	
Course Outcomes:	1. describe analog electronic components and analog electronics circuits 2. explain principle of operation of analog electronic components, filters, regulators and analog electronic circuits. 3. compute parameters and operating points of analog electronic circuits. 4. determine response of analog electronic circuits. 5. distinguish different types amplifier and different types oscillators based on application. 6. construct operational amplifier based circuits for different applications.

Name of the Subject: ELECTRO MAGNETIC FIELD THEORY	
Subject Code: PC-EE 303	
Year: 2nd (New Syllabus)	**Semester:** 3rd
Course Outcomes:	1. relate different coordinate systems for efficient solution of electromagnetic problems. 2. describe mathematical s tools to solve electromagnetic problems. 3. explain laws applied to electromagnetic field. 4. apply mathematical tools and laws to solve electromagnetic problems. 5. analyze electromagnetic wave propagation 6. estimate transmission line parameters. 6. estimate transmission line parameters

Name of the Subject: ENGINEERING MECHANICS	
Subject Code: ES-ME 301	
Year: 2nd (New Syllabus)	**Semester:**3RD
Course Outcomes:	After completing this course, the students will be able to: 1. explain the co-ordinate system, principle of three dimensional rotation,kinematics and kinetics of rigid bodies. 2. elaborate the theory of general motion, bending moment, torsional motion and friction. 3. develop free body diagram of different arrangements. 4. solve problems with the application of theories and principle of motion , friction and rigid bodies. 5. analyze torsional motion and bending moment.

Name of the Subject: MATHEMATICS-III

Subject Code: BS- M 301

Year: 2nd (New Syllabus) | **Semester:** 3RD

Course Outcomes:	1. explain basics of probability theories, rules, distribution and properties of Z transform 2. describe different methods of numerical analysis. 3. solve numerical problems based on probability theories , numerical analysis and Z transform 4. apply numerical methods to solve engineering problems. 5. solve engineering problems using z transform and probability theory.

Name of the Subject: BIOLOGY FOR ENGINEERS

Subject Code: BS- 301

Year: 2nd (New Syllabus) | **Semester:** 3RD

Course Outcomes:	Upon completion of this course, students will be able to: 1. describe with examples the biological observations lead to major discoveries. 2. explain the classification of kingdom of life the building blocks of life different techniques of bio physics used to study biological phenomena. the role of imaging in the screening, diagnosis, staging, and treatments of cancer. • 3. identify DNA as a genetic material in the molecular basis of information transfer • 4. analyze biological processes at the reductionistic level. • 5. apply thermodynamic principles to biological systems. • 6. identify microorganisms.

Name of the Subject: INDIAN CONSTITUTION

Subject Code: : MC-EE 301

Year: 2nd (New Syllabus) | **Semester:** 3RD

Course Outcomes:	After completing this course, the students will be able to: 1. 1. describe *different features of Indian constitution. *power and functioning of Union, state and local self-government. * structure, jurisdiction and function of Indian Judiciary *basics of PIL and guideline for admission of PIL. * Functioning of local administration starting from block to Municipal Corporation. 2. identify authority to redress a problem in the profession and in the society.

Name of the Subject: ELECTRIC CIRCUIT THEORY LAB	
Subject Code: : PC-EE 391	
Year: 2nd (New Syllabus)	**Semester:** 3RD
Course Outcomes:	After completion of this course, the learners will be able to 1. describe analog electronic components and analog electronics circuits 2. explain principle of operation of analog electronic components, filters, regulators and analog electronic circuits. 3. compute parameters and operating points of analog electronic circuits. 4. determine response of analog electronic circuits. 5. distinguish different types amplifier and different types oscillators based on application. 6. construct operational amplifier-based circuits for different applications

Name of the Subject: ANALOG ELECTRONICS LAB	
Subject Code: : PC-EE 392	
Year: 2nd (New Syllabus)	**Semester:** 3RD

Course Outcomes:	After completion of this course, the learners will be able to
	1. determine
	   • characteristics of full wave rectifier with filter and without filter
	   • characteristics of BJT and FET
	   • characteristics of Zener diode as voltage regulator
	   • characteristics of class A, C and push pull amplifiers
	2. verify function of DAC and ADC
	   • construct
	   • function generator using IC
	   • R-C coupled amplifier
	   • linear voltage regulator using regulator IC chip.
	   • timer circuit using 555 for monostable, astable and multistable
	   • multivibrator.
	   • V to I and I to V converter with Op amps.

Name of the Subject: NEUMERICAL METHODS LAB	
Subject Code: PC-CS 391	
Year: 2nd (New Syllabus)	**Semester:** 3RD

Course Outcomes:	After completion of this course, the learners will be able to
	1. solve
	   • problems with Newton forward /backward, Lagrange's interpolation
	   • problems of numerical integration using Trapezoidal rule, Simpson's 1/3
	   • rule, Weddle's rule
	   • problems to find numerical solution of a system of linear equations using
	   • Gauss elimination and Gauss-Seidel iterations.
	   • problems to find numerical solution of Algebraic Equation by Regularfalsi
	   • and Newton Raphson methods.
	   • ordinary differential equation by Euler's and Runga-Kutta methods.
	2. find appropriate numerical methods to solve engineering problems.
	3. use software package to solve numerical problems.

Name of the Subject: Values and Ethics in Profession	
Subject Code: HM EE401	
Year: 2nd (New Syllabus)	**Semester**: 4th
Course Outcomes:	Upon successful completion of the course, student will have: 1. recognize oneself as a socially, culturally responsible citizen. Know the fundamentals of limits and limit gauges, various methods for measurement of screw thread and surface roughness parameters and the working of optical measuring instruments. 2. recognize the Engineering responsibilities concerning the overall welfare of our environment. Get basic idea about working principle and applications of devices for measurement of force and torque; strain and stress and temperature. 3. recognize the importance of IEEE Codes of Ethics and implement the knowledge in the workplace. 4. assess different social contexts properly in order to make the appropriate Engineering decision. 5. recognize the need for Sustainable Development.

Name of the Subject: Thermal Power Engineering	
Subject Code: ES ME 401	
Year: 2nd (New Syllabus)	**Semester**: 4th
Course Outcomes:	1. apply the basic concept of steam boilers to generate steam by the combustion of different kinds of fuels. Students will be able to design the interrelation between human and different biotic or abiotic components of environment in order to take appropriate environmental policy. 2. recognize and analyze the problems related to performance of rotary thermodynamic devices for reaching substantiated conclusion. 3. identify and breakdown the problems related to efficiency and losses of Internal Combustion Engine. 1. analyze the technique of thermodynamic processes to evaluate the efficiency of Gas Turbine.

Name of the Subject: Electric Machine-I	
Subject Code: PC EE 401	
Year: 2nd (New Syllabus)	**Semester**: 4th
Course Outcomes:	1. To review the concept of magnetic fields and magnetic circuits 2. To learn the principle of production of electromagnetic force and torque. 3. To learn the basic principle of operation of DC machine 4. To learn the principle of operation and characteristics of DC motor and generator 5. To learn the principle of operation, connections and different tests on Transformers 6. To acquire problem solving skills to solve problems of DC machines and Transformers

Name of the Subject: Digital Electronics	
Subject Code: PC EE 402	
Year: 2nd (Old Syllabus)	**Semester**: 4th

Course Outcomes:	1.To learn the fundamentals of Digital systems and principle of operation of Logic families. 2.To learn the principle of operation of Combinational digital circuits. 3.To learn the principle of operation of sequential circuit and systems. 4.To learn the principle of operation of A/D and D/A converter 5.To learn the principle of operation of semiconductor memories and Programmable logic devices. 6.To acquire problem solving skills to solve problems of Digital circuits

Name of the Subject: Electrical & Electronic measurement

Subject Code: PC EE 403	
Year: 2nd (New Syllabus)	**Semester**: 4th
Course Outcomes:	1.To learn methods of measurement, errors in measurement and its classification. 2.To learn the principle of operation of analog and digital meters. 3.To learn the basic principle of operation of instrument transformers. 4.To learn the principle of operation of cathode ray oscilloscope and different sensors and transducers. 5.To learn the principle of measurement of power, energy and different electrical parameters 6.To acquire problem solving skills to solve problems on the topics studied.

Name of the Subject: Electric Machine-I Lab(Practical)

Subject Code: PC EE 491	
Year: 2nd (NEW Syllabus)	**Semester**: 4th
Course Outcomes:	1. apply the knowledge of different characteristics of a separately excited DC generator for determination of its performance and efficiency. 2. apply the knowledge of different characteristics of a DC Motor for determination of its performance and efficiency. 3. apply the knowledge of different characteristics of a compound DC generator (short shunt) for determination of its performance and efficiency. 3. identify and analyze the problems related to performance of three phase induction machine reaching substantiated conclusions. 4. apply the knowledge of 3 phase transformer in the field of installation, testing and commissioning of transformers

Name of the Subject: Electrical & Electronic measurement Lab(Practical)

Subject Code: PCEE 493	
Year: 2nd (NEW Syllabus)	**Semester**: 4th
Course Outcomes:	1. apply the knowledge to identify different types of measuring instruments according to their application in practical field. 2. apply the knowledge to find out the value of low resistance by Kelvin double bridge. 3. apply the knowledge to measure the bulk power using instrument transformer. 4. to apply the knowledge to measure power in a poly phase circuit (3 phase) by using wattmeter. 5. apply their knowledge to find out the unknown value of capacitance by De-Sauty bridge, Schering bridge, find out the inductance of a coil by Anderson bridge.

Name of the Subject: DIGITAL ELECTRONICS LABORATORY (Practical)

Subject Code: PCEE 492	
Year: 2nd (NEW Syllabus)	**Semester**: 4th

Course Outcomes:	1. identify appropriate equipment and instruments for the experiment 2. test the instruments for application to the experiment 3. construct decoder , multiplexer, adder and subtractor circuits with appropriate instruments and precaution 4. realize RS-JK and D flip flop, universal register with gates, multiplexer and flip-flops and asynchronous and synchronous up down counters 5. validate the operation of code conversion circuit –BCD to Excess 3 & vice versa, 4 bit parity generator & comparator circuits, 6. work effectively in a team

Name of the Subject: ELECTRIC MACHINE-II PC-EE-501

Subject Code: **PC-EE-501**	
Year: 3rd (New Syllabus)	**Semester:** 5th
Course Outcomes:	On successful completion of the course the student will be able to: 1. To understand the arrangement of windings of AC machines. 2. To understand the principle of production of pulsating and revolving magnetic fields. 3. To understand the principle of operation and characteristics of three phase Induction machines 4. To understand the principle of operation and characteristics of single phase Induction machines 5. To understand the principle of operation and characteristics of synchronous machine 6. To understand the principle of operation and characteristics of special electromechanical devices. 7. To solve problems of Induction machines, synchronous machines and special eletromechanical devices.

Name of the Subject: POWER SYSTEM-I

Subject Code: : PC-EE-502	
Year: 3rd (NEW Syllabus)	**Semester:** 5th
Course Outcomes:	After completion of this course the students will be able to: 1. To understand the basic principle of generation of Electricity from different sources 2. To find parameters and characteristics of overhead transmission lines and cables. 3. To find different parameters for the construction of overhead transmission line 4. To determine the performance of transmission lines. 5. To understand the principle tariff calculation. 6. To solve numerical problems on the topics studied.

Name of the Subject: CONTROL SYSTEM	
Subject Code: PC-EE-503	
Year: 3rd (New Syllabus)	**Semester:** 5th

Course Outcomes:	On completion of this course a student will be in a position to: 1. To find mathematical representation of LTI systems. 2. To find time response of LTI systems of different orders 3. To find the frequency response of LTI systems of different orders 4. To understand stabilityof differentLTI systems. 5. To analyze LTIsystems with state variables. 6. To solve problems of mathematical modelling and stability of LTI systems

Name of the Subject: POWER ELECTRONICS	
Subject Code: PC-EE-504	
Year: 3rd (New Syllabus)	**Semester:** 5th
Course Outcomes:	On completion of this course a students will be able to 1. To understand the functioning and characteristics of power switching devices. 2. To understand the principle of operation of converters. 3. To understand different triggering circuits and techniques of commutation of SCR 4. To find external performance parameter of converters. 5. To analyze methods of voltage control, improvement of power factor and reduction of harmonics of the converter 6. To solve numerical problems of converters 1. .

Name of the Subject: ELECTRIC MACHINE-IILABORATORY	
Subject Code: : PC-EE 591	
Year: 3rd	**Semester:** 5th
Course Outcomes:	After completion of the course, the students will be able to: 1. identify appropriate equipment and instruments for the experiment. 2. test the instrument for application to the experiment. 3. construct circuits with appropriate instruments and safety precautions. 4. validate different characteristics of single phase Induction motor, three phase Induction motor, Induction generator and synchronous motor , methods of speed control of Induction motors and parallel operation of the 3 phase Synchronous generator. 5. work effectively in a team

Name of the Subject: POWER SYSTEM-I LABORATORY	
Subject Code: PC-EE 592	
Year: 3rd	**Semester: 5**th

Course Outcomes:	On completion of this course a students will be able to 1. identify appropriate equipment and instruments for the experiment. 2. test the instrument for application to the experiment. 3. construct circuits with appropriate instruments and safety precautions. 4. validate different characteristics oftransmission line. 5. determine earth resistance, dielectric strength of insulating oil, breakdown strength of solid insulating material and dielectric constant of transformer oil. 6. analyze an electrical transmission line circuit with the help of software 7. work effectively in a team

Name of the Subject: CONTROL SYSTEMLABORATORY

Subject Code: PC-EE 593

Year: 3rd	**Semester:** 5th

Course Outcomes:	After completion of this course the students will be able to 1. identify appropriate equipment and instruments for the experiment. 2. test the instrument for application to the experiment. 3. construct circuits with appropriate instruments and safety precautions. 4. use MAT-Lab control system tool box, MAT-Lab- simulink tool box & PSPICE for simulation of systems. 5. determinecontrol system specifications of first and second order systems. 1.

Name of the Subject: POWER ELECTRONICSLABORATORY

Subject Code: PC-EE 594

Year: 3rd	**Semester:** 5th

Course Outcomes:	On completion of this course a students will be able to 1. identify appropriate equipment and instruments for the experiment. 2. test the instrument for application to the experiment. 3. construct circuits with appropriate instruments and safety precautions

Name of the Subject: DATA STRUCTURE & ALGORITHM

Subject Code: OE-EE-501A

Year: 3rd (New Syllabus)	**Semester:** 5th

Course Outcomes:	On completion of this course a student will be in a position to: 1. differentiate how the choices of data structure & algorithm methods enhance the performance of the program. 2. solve problems based upon different data structure & also write programs. 3. write programs based on different data structure 4. identify appropriate data structure & algorithmic methods in solving problem. 5. discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing 6. comparethe benefits of dynamic and static data structures implementations.

Name of the Subject: OBJECT ORIENTED PROGRAMMING

Subject Code: OE-EE-501B

Year: 3rd (New Syllabus)	**Semester:** 5th

Course Outcomes:	After completion of this course the students will be able to 1. specify simple abstract data types. 2. recognise features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity. 3. apply common object-oriented design patterns 4. specify uses of common object oriented design patterns with examples. 5. design applications with an event-driven graphical user interface.

Name of the Subject: POWER SYSTEM-II

Subject Code: PC-EE-601

Year: 3rd	**Semester:** 6th

Course Outcomes:	After completion of the course, the students will be able to: 1. Represent power system components in line diagrams. 2. Determine the location of distribution substation. 3. Determine the performance of power system with the help of load flowv studies. 4. Analyse faults in Electrical systems. 5. Determine the stabilty of Power system. 6. Explain principle of operation of different power system protection equipments. 7. Solve numerical problems related to representation, load flow, faults, stabilty and protection ofpower system.

Name of the Subject: MICROPROCESSOR & MICROCONTROLLER

Subject Code: PC-EE-602

Year: 3rd	**Semester:** 6th

Course Outcomes:	After completion of the course, the students will be able to
	    1. explain the architecture of 8086 and 8051.
	    2. do assembly language programming of 8086, 8051
	    3. interface different peripheral with 8086 and 8051
	    4. develop micro processor/ microcontroller based systems.
	    5. compare microprocessor, microcontroller, PIC and ARM processors

Name of the Subject: DIGITAL CONTROL SYSTEM

Subject Code: PE-EE-601A

Year: 3rd	**Semester:** 6th

Course Outcomes:	On completion of this course a students will be able to
	
	    1. explain the principle of sampling and reconstrction of analog signal.
	    2. perform Z-transformation and inverse Z-tranaformation of systems.
	    3. analyse and design digital control systems.
	
	    4. design compensators for digital control system to achieve desired specifications.
	
	    5. represent digital control systems using state space models.
	
	    6. analyze the effect sampling on stability, controllability and observability

Name of the Subject: HVDC TRANSMISSION

Subject Code: PE-EE-601B

Year: 3rd	**Semester:** 6th

Course Outcomes:	After completion of this course the students will be able to
	    1. choose intelligently AC and DC transmission systems for the dedicated application(s).
	    2. identify the suitable two-level/multilevel configuration for high power converters.
	    3. select the suitable protection method for various converter faults.
	    4. identify suitable reactive power compensation method.
	    5. decide the configuration for harmonic mitigation on both AC and DC sides.
	    6. solve numerical problems related to converters, power flow analysis, reactive power control.nts.

Name of the Subject: ELECTRICAL MACHINE DESIGN

Subject Code: PE-EE-601C

Year: 3rd	**Semester:** 6th

Course Outcomes:	After completion of this course the students will be able to
	
	    1. specify the rating of electrical machines with standard specifications.
	
	    2. explain the principles of electrical machine design and carry out basic design of an ac machine
	
	    3. determine the various factors which influence the design of electrical, magnetic and thermalloading of electrical machines
	
	    4. explain the construction and performance characteristics of electrical machines.
	
	    5. use software tools to do design calculations.

Name of the Subject: ELECTRICAL AND HYBRID VEHICLE

Subject Code: PE-EE-602A

Year: 3rd (New Syllabus)	**Semester:** 6th

Course Outcomes:	On completion of this course a students will be able to
	1. explain the principle of Electric traction.
	2. choose a suitable drive scheme for developing an electric hybrid vehicle depending on resources.
	3. design and develop basic schemes of electric vehicles and hybrid electric vehicles.
	4. choose proper energy storage systems for vehicle applications
	5. implement different energy management strategies for hybrid vehicle.

Name of the Subject: POWER QUALITYANDFACTS

Subject Code: PE-EE-602B

Year: 3rd (New Syllabus)	**Semester:** 6th

Course Outcomes	1. analyse uncompensated AC transmission line. 2. explain the working principles of FACTS devices and their operating characteristics. 3. apply FACTS devices for power flow control and stabilty. 4. identify different issues of power quality in distribution system. 5. apply different compensation and control techniques for DSTATCOM6. explain working principle of dynamic voltage restorer and UPQC

Name of the Subject: INDUSTRIAL ELECTRICALSYSTEMS

Subject Code: PE-EE-602C

Year: 3rd	**Semester:** 6th

Course Outcomes	1. Represent electrical wiring system for residential, commercial and industrial consumers. 2. Determine the rating of components of residential and commercial electrical systems. 3. Design lighting scheme for a residential and commercial premises. 4. Select transformer, switchgear, protection equipments for industrial electrical systems. 5. explain methods of automation of Industrial Electrical Systems 6. Solve numerical problems related to earthing system, lighting scheme, power factor correction.

Name of the Subject: DIGITAL SIGNALPROCESSING

Subject Code: PE-EE-601A

Year: 3rd	**Semester:** 6th

Course Outcomes	1. represent signals mathematically in continuous and discrete-time and in the frequencydomain. 2. analyse discrete-time systems using z-transform. 3. explain the Discrete-Fourier Transform (DFT) and the FFT algorithms. 4. design digital filters for various applications. 5. apply digital signal processing for the analysis of real-life signals.

Name of the Subject: COMMUNICATION ENGINEERING

Subject Code: PE-EE-601B

Year: 3rd	**Semester:** 6th

Course Outcomes	1. compare the performance of AM, FM and PM schemes with reference to SNR 2. explain noise as a random process and its effect on communication receivers 3. evaluate the performance of ASK, FSK, PSK, BPSK, QPSK in a digital communication system 4. identify source coding and channel coding schemes for a given communication link 5. analyze various digital modulation methods 6. compute band width requirement and probability of error in various digital modulation systems

Name of the Subject: VLSI AND MICROELECTRONICS

Subject Code: PE-EE-603C

Year: 3rd	**Semester:** 6th

Course Outcomes	1. explain the principle of design of VLSI circuits 2. explain different MOS structure with characteristics 3. apply different processes for VLSI fabrication 4. use programming language for the design of logic circuits 5. draw the stick diagram and layout for simple MOS circuits

Name of the Subject: ECONOMICS FOR ENGINEERS

Subject Code: HM-EE-601

Year: 3rd (New Syllabus)	**Semester:** 6th

Course Outcomes	1. evaluate the economic theories, cost concepts and pricing policies 2. explain the market structures and integration concepts 3. apply the concepts of financial management for project appraisal 4. explain accounting systems , the impact of inflation, taxation, depreciation 5. analyze financial statements using ratio analysis 6. explain financial planning, economic basis for replacement, project scheduling, legal andregulatory issues applied to economic investment and project-management problems

Name of the Subject: POWER SYSTEM-II LABORATORY

Subject Code: PC-EE 691

Year: 3rd	**Semester:** 6th

Course Outcomes	1. Identify appropriate equipment and instruments for the experiment. 2. Test the instrument for application to the experiment. 3. Construct circuits with appropriate instruments and safety precautions. 4. Validate the characteristics of under voltage relay, over current relay, earth fault relay, on loadtime delay relay, off load time delay relay, CT and PT. 5. Validate protection schemes of transformer, generator, motor and feeder. 6. Apply software tools to find bus voltage, currents and power flows throughout the electrical system. 7. work effectively in a team

Name of the Subject: MICRO PROCESSOR AND MICRO CONTROLLERLABORATORY

Subject Code: : PC-EE 692

Year: 3rd	**Semester:** 6th

Course Outcomes	1. identify appropriate equipment and instruments for the experiment 2. test the instrument for application to the experiment 3. construct circuits with appropriate instruments and safety precautions 4. program 8086 for arithmatic operation, sorting of array, searching for a number in a string andstring manipulation 5. interface ADC/DAC, 8255, 8251 to 8086 and LCD, keyboard to 8051

	6. program 8051 using arithmetic, logical and bit manipulation instructions of 8051 7. work effectively in a team

Name of the Subject: ELECTRICAL AND ELECTRONICS DESIGNLABORATORY

Subject Code: PC-EE 681

Year: 3rd	**Semester:** 6th
Course Outcomes	1. explain basic concept of measurement, noise in electronic system, sensor and signal conditioning circuits 2. implement PC based data acquisition systems 3. construct circuits with appropriate instruments and safety precautions 4. design heating elements, air core grounding reactor, power distribution system for small township, double circuit transmission line and Electric machines 5. do wiring and installation design of a multistoried residential building with lift and pump 6. design electronic hardware for controller of lift, speed of AC/DC motor, and for an application with analog, digital, mixed signal, microcontroller and PCB

Name of the Subject: ELECTRIC DRIVE	
Subject Code: EE 701	
Year: 4TH Old syllabus	**Semester:** 7th
Course Outcomes	1. explain the principle of operation of converters for AC drives. 2. model Induction and Synchronous motor by reference frame theory. 3. apply different control methods to control speed and torque of Induction and Synchronous motor. 4. explain the configurations and method of speed control of BLDC, PMSM and SRM. 5. realize basic blocks for DSP based motion control. 6. develop appropriate scheme for speed control of Induction and Synchronous motor.
Name of the Subject: UTILIZATION OF ELECTRIC POWER	
Subject Code: : EE 702	
Year: 4TH	**Semester: 7**th
Course Outcomes	1. explain the fundamentals of illumination and different lighting schemes. 2. explain the fundamental of Electrolytic processes, Electric heating and Welding. 3. able to select appropriate lighting, heating and welding techniques for specific applications. 4. apply different electrolysis process for different applications. 5. explain the principle of different aspect of Electric traction and control of traction motor.
Name of the Subject: POWER SYSTEM III	
Subject Code: 703A	
Year: 4TH Old syllabus	**Semester:** 8th
Course Outcomes	1. explain the model of power system components 2. select the appropriate model for required analysis. 3. analyze the performance of the system with small signal analysis. 4. evaluate the stability of the single and multi machine systems. 5. develop measures for enhancing the stability of the system. 6. Solve numerical problems of linear dynamical system, modeling of different components and stability.
Name of the Subject: CONTROL SYSTEM III	
Subject Code: : EE 703B	
Year: 4TH	**Semester:** 8th
Course Outcomes	1. Apply the knowledge of feedback linearization to solve complex control engineering problems. 2. Apply the knowledge of sliding mode control to improve the performance of nonlinear complex engineering systems. 3. Apply the knowledge of optimal control to optimize the performance of linear complex Engineering problems.
Name of the Subject: HIGH VOLTAGE ENGINEERING	
Subject Code: EE 704A	
Year: 4TH	**Semester:** 7th

Course Outcomes:	After completion of this course the students will be able to 1. choose intelligently AC and DC transmission systems for the dedicated application(s). 2. identify the suitable two-level/multilevel configuration for high power converters. 3. select the suitable protection method for various converter faults. 4. identify suitable reactive power compensation method. 5. decide the configuration for harmonic mitigation on both AC and DC sides. 6. solve numerical problems related to converters, power flow analysis, reactive power control.nts.

Name of the Subject: RENEWABLE & NON CONVENTIONAL ENERGY

Year: 4TH Old syllabus	**Semester:** 7th

Subject Code: EE 704D	

Course Outcomes:	After completion of this course the students will be able to 1. apply the knowledge of non-conventional energy resources for solving complex electrical engineering problems related to energy production, utilization & consumption. 2. identify and analyze the problems related National scenarios of energy production reaching substantiated conclusions. 3. apply the knowledge of different components of solar systems to solve complex electrical engineering problems related to their operating principle, construction and working of different equipment based on solar system used in domestic and commercial purpose for water heating & illumination purpose. 4. identify and analyze a given physical problem related to different ways of utilizing biomass, wind and ocean energy their properties using basic heat transfer principles reaching substantiated conclusions.

Name of the Subject: COMPUTER NETWORK

Subject Code: EE 705A	
Year: 4TH	**Semester:** 7th

Course Outcomes:	After completion of this course the students will be able to 1. develop the concept of OSI reference model, TCP/IP reference model and associate them with the terminology. 2. design and performance issue in different networks and express their concept about network protocols, interfaces. 3. analyze different flow and error control mechanism that are must for reliable data transmission through an unreliable transmission medium. 4. apply their concept to solve complex problem that may arise during data communication and improve quality of service.

Name of the Subject: ELECTRIC DRIVE (PRACTICAL)

Year: 4TH Old syllabus	**Semester:** 7th

Subject Code: EE 791	

Course Outcomes:	After completion of this course the students will be able to 1. Apply the knowledge of power thyristor and chopper for the speed control of DC motor drive. 2. Identify the problems related to speed control of three phase induction motor drives. 3. Analyse the data obtained experimentally by performing the speed control of a single-phase induction motor using triac. 4. Use modern engineering and IT tools to analyse the complex engineering problems related to the performance of different types of AC motor. 5. Identify and analyse the problems related to the performance of permanent magnet synchronous motor to reach substantiated conclusion using modern engineering and IT tools.

Name of the Subject: COMPUTER NETWORK (PRACTICAL)	
Subject Code: EE 792A	
Year: 4TH	**Semester:** 7th
Course Outcomes:	After completion of this course the students will be able to 1. apply the different troubleshooting techniques of computer networks to solve engineering problems. 2 Students will be able to analyze different components of computer network to configure a Local Area Network. 3. Students will be able to implement socket programming and different applications during data communication. 4. Students will be able to implement different flow control, error control and file transfer techniques.

Name of the Subject: SEMINAR ON INDUSTRIAL TRAINING (SESSIONAL	
Subject Code: EE 781	
Year: 4TH	**Semester:** 7th
Course Outcomes:	After completion of this course the students will be able to 1. Students will be able to communicate the details of training through Training Report, Presentation and viva voice. 2. Students will be able to understand implication of engineering solutions in social and environment perspective.

Name of the Subject: Electrical system design-I (Sessional)	
Subject Code: EE 782	
Year: 4TH	**Semester:** 7th
Course Outcomes:	After completion of this course the students will be able to 1. Students will be able to design a heating element with specified voltage, wattage and temperature rise applying the knowledge of science and engineering fundamentals. 2. Students will be able to design an air core grounding reactor with specified operating voltage and current applying the knowledge of science and engineering fundamentals. 3. Students will be able to design a power distribution system for a township that meet the specified needs with appropriate considerations for the safety and environmental considerations applying the knowledge of science and electrical engineering..

Name of the Subject: HVDC transmission **Subject Code:** EE 801A	
Year: 4TH	**Semester:** 8th

Course Outcomes	1. Students will be able to solve a complex converter circuit with the help of knowledge of fundamentals of high voltage DC transmission. Students will have the ability to apply modern engineering tools like Matlab 2. to model complex engineering problems of HVDC with an understanding of the limitation of the modelling. 3. Students will be able to develop a control scheme for various types of HVDC systems based on requirement. 4. Students will have the ability to design harmonic filters that improves the power quality which is important from the point of view of consumers and that has a vast effect on society. 5. Students will be able to solve complex engineering problems on faults in HVDC systems can select the type of HVDC systems based on requirement. Students will be able to select different types of MTDC HVDC systems based on system requirement.

Name of the Subject: ILLUMINATION ENGINEERING

Subject Code: EE 801B	
Year: 4TH Old syllabus	**Semester:** 8th
Course Outcomes	1. Students will be able to apply knowledge of basic physical sciences to assimilate concept of basic terms used in Lighting (i.e. Luminous flux, luminance, illuminance etc.), basic laws of illumination and understanding of visible spectra. 2. Students will be able to apply the knowledge of core electrical engineering subjects for Understanding various light generation techniques and utilization of electricity for lighting 3. Students will be able to appreciate relevance of energy efficient lighting and environmental issues related to lighting practice. 4. Students will be able to apply basic knowledge of the course towards manual and computer aided lighting design as a modern engineering tool.

Name of the Subject: ENERGY MANAGEMENT & AUDIT

Subject Code: EE 801C		
Year: 4TH Old syllabus	**Semester:** 8th	**Semester:** 8th
Course Outcomes	1. Students will be able to use research-based knowledge and research methods on en energy audit and analysis and interpretation of data regarding auditing, synthesis of the information to provide valid conclusions on energy audit. 2. Students will be able to demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a auditor and leader in a team, to manage projects and in multidisciplinary environments. 3. Students will be able to understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable Development. 4. Students will be able to apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. 5. Students will be able to identify and analyze a complex problem of energy management and energy crisis in order to reach in substantiated conclusion. 6 Students will be able to apply their knowledge of energy management to solve a complex problem related to energy pricing , tariff structure and reformation of energy sector.	

Name of the Subject: SENSORS AND TRANSDUCERS

Subject Code: EE 801B

Year: 4TH	**Semester:** 8th
Course Outcomes	1 The students will be able to apply the knowledge of mechanical and electro mechanical sensors to solve complex engineering problem related to fundamental electro mechanical principles and their applications. 2 Students will be able to identify and analyze the problems of mechanical and electro mechanical sensors reaching substantiated conclusions. 3 The students will be able to apply the knowledge of thermal sensors to solve complex engineering problems related to understanding of various strategies for sensing and actuating as well as knowledge of the classes of sensors. 4 Students will be able to identify and analyze a given physical problem related to thermal sensors their properties, manufacturing and the theory behind them reaching substantiated conclusions. 5 The students will be able to apply the knowledge of capacitive sensors to solve complex engineering problems related to operations of different sensors for industrial and environmental use. 6 The students will be able to design system components for measuring different physical parameters such as temperature; pressure etc. in terms of different forms of energies such as mechanical, thermal, electrical, magnetic, radiant and chemical. 7 The students will know correct use of sensors in measurement process control and environmental monitoring applications. 8 Students will be able to identify and analyze a given physical problem related to magnetic sensors their properties, manufacturing and the theory behind them reaching substantiated conclusions.

Name of the Subject: PROJECT (SESSIONAL)

Subject Code: EE 881

Year: 4TH Old syllabus	**Semester:** 8th
Course Outcomes	1 The students will be able to formulate the problem 2 The students will be able to develop or design a solution for the problem 3 Build up project prototype or model in hardware or software 4 Analyze the experimental collected data 5 Do investigation/research in the problem area 6 Apply fundamental and specialized knowledge in the area of the problem. 7 Students will be able to self learn new methods, tools and techniques 8 Students will be able to apply modern tools and techniques 9 Students will be able to work individually and also in team 10 Students will be able to communicate the details and findings of the project through Project report, Presentation, Viva-voice and paper presentation if any

Name of the Subject: ELECTRICAL SYSTEM LAB-II (PRACTICAL)

Year: 4TH Old syllabus	**Semester:** 8th

Subject Code: EE 882

Course Outcomes	1 Students will be able to design machines for a given set of parameters. 2 Students will be able to develop power distribution system for a small network system considering safety, legal and environmental aspect. 3 Course will develop team working capability of the students while working in groups.

Name of the Subject: GRAND VIVA (SESSIONAL)

Subject Code: EE 883

Year: 4TH Old syllabus | **Semester:** 8th

Course Outcomes	1 student will be able to identify, analyze and propose solutions to complex electrical engineering problems. 2 students will be able to successfully solve problems which require a multidisciplinary approach. 3 students will be able to function according to the expected behavioral and ethical norms in the practice of electrical engineering, having a clear understanding of such norms.

PROGRAMME OUTCOMES (PO) BASED ON G.A.

Name of the Subject: ELECTRIC CIRCUIT THEORY

Subject Code: PCE301

Year: 2ND | **Semester: 3RD**

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√	√	√								
	CO3	√	√	√									
	CO4	√	√	√	√								
	CO5	√	√	√									
	CO6	√	√	√	√	√							

Name of the Subject:ANLOG ELECTRONICS

Subject Code: PCEE302

Year: 2ND | **Semester: 3RD**

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√	√	√								
	CO3	√	√	√									
	CO4	√	√	√	√								
	CO5	√	√	√									

Name of the Subject: ELECTRO MAGNETIC FIELD THEORY

Subject Code: PC-EE 303

Year: 2ND | **Semester: 3RD**

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√	√	√								
	CO3	√	√	√	√								
	CO4	√	√	√	√								
	CO5	√	√	√	√								
	CO6	√	√	√	√								

Name of the Subject: ENGINEERING MECHANICS

Subject Code: ES-ME 301

Year: 2ND | **Semester:** 3RD

Course Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√	√	√								
	CO3	√	√	√	√								
	CO4	√	√	√	√								
	CO5	√	√	√	√								

Name of the Subject: MATHEMATICS

Subject Code: BS M 301

Year: 2ND | **Semester:** 7th

Course Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√		√								
	CO2	√	√		√								
	CO3	√	√		√	√							
	CO4	√	√		√								
	CO5	√	√		√	√							
	CO6	√	√		√								

Name of the Subject: BIOLOGY FOR ENGINEERS

Subject Code: BS EE 301

Year: 2ND | **Semester:** 3RD

Course Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√											
	CO2	√			√								
	CO3	√			√		√						
	CO4	√			√			√					
	CO5	√			√			√					
	CO6	√			√			√					

Name of the Subject: INDIAN CONSTITUTION

Subject Code: MC EE 301

Year: 2ND | **Semester:** 3RD

Course Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√					√	√					
	CO2						√	√					

Name of the Subject: ELECTRIC CIRCUIT THEORY LABORATORY

Subject Code: PC EE 391

Year: 2ND | **Semester:** 3RD

Course Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√	√	√								
	CO3	√	√	√									
	CO4	√	√	√	√								
	CO5	√	√	√									
	CO6	√	√	√	√	√							

Name of the Subject: ANLOG ELECTRONICS LABORATORY

Subject Code: PCEE392 **Semester: 3RD**

Year: 2ND

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√	√	√								
	CO3	√	√	√									
	CO4	√	√	√	√								
	CO5	√	√	√									

Name of the Subject: NUMERICL METHODS LABORATORY

Subject Code: BS M 301

Year: 2ND **Semester: 3RD**

Name of the Subject:ELECTRIC MACHINE I

Subject Code: PC EE 401

Year: 2ND **Semester: 4TH**

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√	√	√								
	CO3	√	√										
	CO4	√	√										
	CO5	√	√										
	CO6	√	√	√	√								

Name of the Subject: DIGITAL ELECTRONICS

Subject Code: PC EE 402

Year: 2ND **Semester: 4TH**

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√	√	√		√						
	CO3	√	√	√									
	CO4	√	√	√									
	CO5	√	√	√	√								
	CO6	√	√	√	√								

Name of the Subject: ELECTRICAL AND ELECTRONICS MEASUREMENT

Subject Code: PC EE 403

Year: 2ND **Semester: 4TH**

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√	√	√			√			
CO2	√	√	√			√			√			
CO3	√	√	√									
CO4	√					√						
CO5	√			√	√							
CO6	√	√	√		√							

Name of the Subject: THERMAL POWER ENGINEERING

Subject Code: ES EE 401

Year: 2ND   **Semester:** 4TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√	√				√			
CO2	√	√							√		√	
CO3	√	√	√								√	
CO4	√											
CO5	√			√	√						√	
CO6	√	√	√	√	√							

Name of the Subject: VALUES AND ETHICS IN PROFESSION

Subject Code: HM EE 401

Year: 2ND   **Semester:** 4TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√	√	√			√			
CO2	√	√	√			√			√		√	
CO3	√	√	√			√					√	
CO4	√					√					√	
CO5	√			√	√						√	
CO6	√	√	√	√	√							

Name of the Subject: ENVIRONMENTAL SCIENCE

Subject Code: MC EE 401

Year: 2ND   **Semester:** 4TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√	√	√			√			
CO2	√	√	√			√			√		√	
CO3	√	√	√			√					√	
CO4	√					√					√	
CO5	√			√	√						√	
CO6	√	√	√	√	√							

Name of the Subject: ELECTRIC MACHINE I LABORATORY

Subject Code: PC EE 491

Year: 2ND   **Semester:** 4TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Programme Outcomes												
CO1	√	√	√	√	√							
CO2	√	√										
CO3	√	√	√			√						
CO4	√					√						
CO5	√			√	√							
CO6	√	√	√	√	√							

Name of the Subject: DIGITAL ELECTRONICS LABORATORY

Subject Code: PC EE 492

Year: 2ND **Semester:** 4TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Programme Outcomes												
CO1	√	√	√	√	√	√						
CO2	√	√	√			√						
CO3	√	√	√			√						
CO4	√					√						
CO5	√			√	√							
CO6	√	√	√	√	√							

Name of the Subject: ELECTRICAL AND ELECTRONICS MEASUREMENT LABORATORY

Subject Code: PC EE 493

Year: 2ND **Semester:** 4TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Programme Outcomes												
CO1	√	√	√	√	√	√						
CO2	√	√	√									
CO3	√	√	√									
CO4	√											
CO5	√			√	√							
CO6	√	√	√	√	√							

Name of the Subject: THERMAL POWER ENGINEERING LABORATORY

Subject Code: ES ME 491

Year: 2ND **Semester:** 4TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Programme Outcomes												
CO1	√	√	√	√	√	√						
CO2	√	√	√			√						
CO3	√	√	√			√						
CO4	√					√						
CO5	√			√	√							
CO6	√	√	√	√	√							

Name of the Subject: Electric machine-II

Name of the Subject: ELECTRIC MACHINE II

Subject Code: PC EE 501

Year: 3RD **Semester:** 5TH

POS&COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√			√			√					
CO3	√			√		√						
CO4				√		√						
CO5		√	√		√	√	√		√			
CO6	√	√	√		√				√			

Name of the Subject: ELECTRIC MACHINE II LABORATORY

Subject Code: PC EE 591

Year: 3RD | **Semester:** 5TH

POS&COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√			√			√					
CO3	√			√								
CO4				√								
CO5		√	√				√		√			
CO6	√	√	√						√			

Name of the Subject: POWER SYSTEM I

Subject Code: PC EE 502

Year: 3RD | **Semester:** 5TH

POS&COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√			√			√					
CO3	√			√		√						
CO4				√		√						
CO5		√	√			√	√		√			
CO6	√	√	√						√			

Name of the Subject: POWER SYSTEM I LABORATORY

Subject Code: PC EE 592

Year: 3RD | **Semester:** 5TH

POS&COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√			√			√					
CO3	√			√		√						
CO4				√		√						
CO5		√	√			√	√		√			
CO6	√	√	√						√			

Name of the Subject: CONTROL SYSTEM

Subject Code: PC EE 503

Year: 3RD | **Semester:** 5TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√			√			√					
CO3	√			√								
CO4				√								
CO5		√	√				√		√			
CO6	√	√	√						√			

Name of the Subject: CONTROL SYSTEM LABORATORY
Subject Code: PC EE 593
Year: 3RD **Semester:** 5TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√			√			√					
CO3	√			√								
CO4				√								
CO5		√	√				√		√			
CO6	√	√	√						√			

Name of the Subject: POWER ELECTRONICS
Subject Code: PC EE 504
Year: 3RD **Semester:** 5TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									√
CO2	√						√					√
CO3	√											
CO4												
CO5		√	√				√		√			
CO6	√	√	√						√			√

Name of the Subject: POWER ELECTRONICS LABORATORY
Subject Code: PC EE 594
Year: 3RD **Semester:** 5TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									√
CO2	√						√					√
CO3	√											
CO4												
CO5		√	√				√		√			
CO6	√	√	√						√			√

Name of the Subject: HIGH VOLTAGE ENGINEERING
Subject Code: EE PE 501 A
Year: 3RD **Semester:** 5TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√						√				
CO3	√	√										
CO4	√											
CO5	√		√	√				√		√		
CO6	√	√	√	√						√		

Name of the Subject: RENEWABLE AND NON CONVENTIONAL ENERGY

Subject Code: EE PE 501 C

Year: 3RD | **Semester:** 5TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√						√				
CO3	√	√							√			
CO4	√								√			
CO5	√		√	√					√	√	√	
CO6	√	√	√	√					√	√		

Name of the Subject: DATA STRUCTURE AND ALGORITHM

Subject Code: OE EE 501A

Year: 3RD | **Semester:** 5TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√						√				
CO3	√	√										
CO4	√											
CO5	√		√	√				√		√		
CO6	√	√	√	√						√		

Name of the Subject: OBJECT ORIENTED PROGRAMMING

Subject Code: OE EE 501B

Year: 3RD | **Semester:** 5TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√						√				
CO3	√	√										
CO4	√											
CO5	√		√	√				√		√		
CO6	√	√	√	√						√		

Name of the Subject: COMPUTER ORG ANISTION AND ARCHITECTURE

Subject Code: OE EE 501C

Year: 3RD | **Semester:** 5TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√						√				
CO3	√	√										
CO4	√											
CO5	√		√	√				√		√		
CO6	√	√	√	√						√		

Name of the Subject: POWER SYSTEM II

Subject Code: PC EE 601

Year: 3RD **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√					√	√				√
CO3	√	√					√					√
CO4	√											√
CO5	√		√	√			√	√		√		
CO6	√	√	√	√						√		

Name of the Subject: POWER SYSTEM II LABORATORY

Subject Code: PC EE 691

Year: 3RD **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√					√	√				
CO3	√	√					√					
CO4	√											
CO5	√		√	√			√	√		√		
CO6	√	√	√	√						√		

Name of the Subject: MICRO PROCESSOR AND MICROCONTROLLER

Subject Code: PC EE 602

Year: 3RD **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√					√	√				
CO3	√	√					√					
CO4	√	√			√							
CO5	√	√	√	√	√		√	√		√		
CO6	√	√	√	√	√					√		

Name of the Subject: MICRO PROCESSOR AND MICROCONTROLLER LABORATORY

Subject Code: PC EE 692

Year: 3RD **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√					√	√				
CO3	√	√					√					
CO4	√	√			√							
CO5	√	√	√	√	√		√	√		√		
CO6	√	√	√	√	√					√		

Name of the Subject: ELECTRICAL AND ELECTRONIC DESIGN LABORATORY

Subject Code: PC EE 681

Year: 3RD   **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√	√							
CO2	√	√			√		√					
CO3	√	√					√					
CO4	√	√										
CO5	√	√	√	√	√		√	√		√		
CO6	√	√	√	√	√					√		

Name of the Subject: DIGITAL CONTROL SYSTEM

Subject Code: PE EE 601 A

Year: 3RD   **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√			√		√	√					
CO3	√			√		√	√					
CO4	√			√								
CO5	√	√	√	√			√		√			
CO6	√	√	√	√					√			

Name of the Subject: HVDC TRANSMISSION

Subject Code: PE EE 601B

Year: 3RD   **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√			√		√	√					
CO3	√			√		√	√					
CO4	√			√								
CO5	√	√	√	√		√	√					
CO6	√	√	√	√								

Name of the Subject: ELECTRICL MACHINE DESIGN

Subject Code: PE EE 601C

Year: 3RD   **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√	√	√		√	√					√
CO3	√	√				√	√					√
CO4	√	√					√					√
CO5	√	√	√	√			√					
CO6	√	√	√	√								

Name of the Subject: POWER QUALITY AND FACTS

Subject Code: PE EE 602 B

Year: 3RD **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√	√	√		√	√					
CO3	√	√				√	√					
CO4	√	√					√					
CO5	√	√	√	√			√					
CO6	√	√	√	√								

Name of the Subject: DIGITAL SIGNAL PROCESSING

Subject Code: OE EE 601 A

Year: 3RD **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√	√	√								
CO3	√					√	√	√				
CO4	√	√	√			√		√				
CO5	√					√		√				
CO6	√	√	√	√								

Name of the Subject: COMMUNIC ATION ENGINEERING

Subject Code: OE EE 601 B

Year: 3RD **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√	√	√								
CO3	√			√		√	√	√				
CO4	√	√	√	√		√		√				
CO5	√					√		√				
CO6	√	√	√	√								

Name of the Subject: ECONOMICS FOR ENGINEERS

Subject Code: HM EE 601

Year: 3RD **Semester:** 6TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√		√					√	
CO2	√	√	√	√		√					√	
CO3	√	√	√	√		√					√	√
CO4	√	√		√								√
CO5	√	√		√		√						√
CO6	√	√		√		√					√	√

Subject Code: EE 701													
Year: 4TH	**Semester:** 7TH												

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√	√						√	
	CO2	√	√			√							
	CO3	√				√						√	
	CO4	√	√	√	√	√	√						
	CO5	√	√	√			√					√	
	CO6	√	√	√		√							

Name of the Subject: ELECTRIC DRIVE LABORATORY

Subject Code: EE 791													
Year: 4TH	**Semester:** 7TH												

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√	√						√	
	CO2	√	√			√							
	CO3	√				√						√	
	CO4	√	√	√	√	√	√						
	CO5	√	√	√			√					√	
	CO6	√	√	√		√							

Name of the Subject: UTILISATION OF ELECTRIC POWER

Subject Code: EE 702													
Year: 4TH	**Semester:** 7TH												

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√										
	CO2	√	√										
	CO3	√	√				√						
	CO4	√	√			√							
	CO5	√	√			√		√					
	CO6	√	√			√							

Name of the Subject: POWER SYSTEM III

Subject Code: EE 703A	
Year: 4TH	**Semester:** 7TH

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√		√		√	√				
	CO2	√	√	√		√	√	√	√			√	
	CO3	√	√	√			√	√	√			√	
	CO4	√	√	√		√						√	
	CO5	√	√	√		√	√					√	
	CO6	√	√	√		√	√	√	√				

Name of the Subject: CONTROL SYSTEM III
Subject Code: EE 703B
Year: 4TH | **Semester:** 7TH

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√	√						√	
	CO2	√	√			√						√	
	CO3	√	√			√						√	
	CO4	√	√	√	√	√							
	CO5	√	√	√								√	
	CO6	√	√	√		√							

Name of the Subject: HIGH VOLTAGE ENGINEERING
Subject Code: EE 704A
Year: 4TH | **Semester:** 7TH

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√						√				
	CO3	√	√							√			
	CO4	√								√			
	CO5	√		√	√				√	√	√		
	CO6	√	√	√	√					√	√		

Name of the Subject: RENEWABLE AND NON CONVENTIONAL ENERGY
Subject Code: EE 704D
Year: 4TH | **Semester:** 7TH

Programme Outcomes	POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	√	√	√	√								
	CO2	√	√						√				
	CO3	√	√							√			
	CO4	√								√			
	CO5	√		√	√				√	√	√		
	CO6	√	√	√	√					√	√		

Name of the Subject: COMPUTER NETWORK
Subject Code: EE 705A
Year: 4TH | **Semester:** 7TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√	√							
CO2	√	√	√	√								
CO3	√	√		√								
CO4	√	√		√	√		√					
CO5	√	√		√	√		√					
CO6	√	√	√	√	√		√					

Programme Outcomes (label at left of above table)

Name of the Subject: COMPUTER NETWORK

Subject Code: EE 792A

Year: 4TH **Semester:** 7TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√	√							
CO2	√	√	√	√								
CO3	√	√		√								
CO4	√	√		√	√		√					
CO5	√	√		√	√		√					
CO6	√	√	√	√	√		√					

Name of the Subject: SEMINAR ON INDUSTRIAL TRAINING

Subject Code: EE781

Year: 4TH **Semester:** 7TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√			√						
CO2	√	√	√	√		√						
CO3	√		√	√								
CO4	√	√		√			√					
CO5	√	√	√				√					
CO6	√	√		√			√					

Name of the Subject: ELECTRIC SYSTEM DESIGN I

Subject Code: EE782

Year: 4TH **Semester:** 7TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√		√							
CO2	√	√	√		√							
CO3	√	√	√	√	√							
CO4	√	√	√	√								
CO5	√	√	√	√								
CO6	√	√	√									

Name of the Subject: PROJECT I

Subject Code: EE 783

Year: 4TH **Semester:** 7TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√			√					√		
CO2	√	√	√		√					√		
CO3	√	√	√				√					
CO4	√	√	√				√					
CO5	√	√	√	√								
CO6	√	√	√	√								

Name of the Subject: ORGANISATIONAL BEHAVIOUR

Subject Code: HU 801 A

Year: 4TH | **Semester:** 8TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√	√	√								
CO3	√	√	√	√	√							
CO4	√	√	√	√								
CO5	√	√	√	√								√
CO6	√	√	√	√								

Name of the Subject: HVDC TRANSMISSION

Subject Code: EE 801 A

Year: 4TH | **Semester:** 8TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√	√	√								
CO3	√	√	√	√	√							
CO4	√	√	√	√								
CO5	√	√	√	√								√
CO6	√	√	√	√								

Name of the Subject: ILLUMINATION ENGINEERING

Subject Code: EE 801B

Year: 4TH | **Semester:** 8TH

POS& COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√								√		
CO2	√	√									√	
CO3	√	√										√
CO4	√	√										
CO5	√	√									√	
CO6	√	√										√

Name of the Subject: ENERGY MANAGEMENT AND AUDIT

Subject Code: EE 801C

Year: 4TH | **Semester:** 8TH

POS&COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√		√		√	√				
CO2	√	√	√		√	√	√	√			√	
CO3	√	√	√			√	√	√			√	
CO4	√	√	√			√					√	
CO5	√	√	√		√	√					√	
CO6	√	√	√		√	√	√	√				

Name of the Subject: SENSORS AND TRANSDUCERS

Subject Code: EE802B

Year: 4TH | **Semester:** 8TH

POS&COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2	√	√		√								
CO3	√	√			√							
CO4	√	√		√								
CO5	√	√		√								
CO6	√	√		√	√							

Name of the Subject: PROJECT STAGE II

Subject Code: EE 881

Year: 4TH | **Semester:** 8TH

POS&COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√	√							
CO2	√	√	√	√						√		
CO3	√	√	√	√					√		√	
CO4	√	√	√	√		√						
CO5	√	√	√	√				√				
CO6	√	√	√	√								√

Name of the Subject: ELECTRICAL SYSTEM LAB II

Subject Code: EE 882

Year: 4TH | **Semester:** 8TH

POS&COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√	√							
CO2	√	√	√	√						√		
CO3	√	√	√	√					√		√	
CO4	√	√	√	√		√						
CO5	√	√	√	√					√			
CO6	√	√	√	√								√

CALCUTTA INSTITUTE OF ENGINEERING AND MANAGEMENT
DEPARTMENT OF INFORMATION TECHNOLOGY
ACADEMIC YEAR 2021-2022
CO PO MAPPING FOR ODD SEMESTER,2021

PROGRAM OUTCOMES

PO-1: Engineering Knowledge:
Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2: 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.

PO-3: 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.

PO-4: 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.

PO-5: Modern tool usage:
Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO-6: 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.

PO-7: 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.

PO-8: Ethics:
Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9: Individual and team work:
Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10: 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.

PO-11: 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.

PO-12: 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.

COURSE DETAILS

COURSE NAME	Physics I
COURSE CODE	**BS PH-101**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2	√	√		√								
CO3	√	√	√	√								
CO4	√			√								
CO5	√	√		√								
CO6	√		√									

COURSE DETAILS

COURSE NAME	Mathematics I(A)
COURSE CODE	**BS-M(101)**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2	√	√										
CO3	√	√										

COURSE DETAILS

COURSE NAME	Basic Electrical Engineering
COURSE CODE	**ES-EE101**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√		√								
CO2	√				√							
CO3	√						√					

COURSE DETAILS

COURSE NAME	Physics – I Laboratory
COURSE CODE	**BS PH-191**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2	√	√		√								
CO3	√			√								
CO4	√	√		√								
CO5	√	√		√								

COURSE DETAILS

COURSE NAME	Basic Electrical Engineering Laboratory
COURSE CODE	**ES-EE191**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√					√						
CO2	√		√		√							
CO3	√				√							

COURSE DETAILS

COURSE NAME	Workshop/Manufacturing Practices
COURSE CODE	**ES - ME 192**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	1

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√							
CO2	√											
CO3	√		√		√							
CO4	√				√							

COURSE DETAILS

COURSE NAME	Analog & Digital Electronics
COURSE CODE	**ESC301**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√		√									
CO2	√	√	√									
CO3	√		√									

COURSE DETAILS

COURSE NAME	Data Structure & Algorithm
COURSE CODE	**PCC-CS301**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2		√	√									
CO3			√	√								
CO4		√		√								
CO5		√	√									

COURSE DETAILS

COURSE NAME	Computer Orgranization
COURSE CODE	**PCC-CS302**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2			√									
CO3		√		√								
CO4			√	√	√							

COURSE DETAILS

COURSE NAME	Mathematics – III (Differential Calculus)
COURSE CODE	**BSC-301**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2	√	√	√									
CO3			√	√								
CO4			√	√								
CO5		√			√							

COURSE DETAILS

COURSE NAME	Economics for Engineers (Humanities – II)
COURSE CODE	**HSMC 301**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2		√									√	√
CO3							√					

COURSE DETAILS

COURSE NAME	Analog & Digital Electronics Laboratory
COURSE CODE	**ESC391**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√									
CO2			√	√								
CO3			√									

COURSE DETAILS

COURSE NAME	Data Structures and Algorithms
COURSE CODE	**PCC-CS391**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√		√		√							
CO2	√		√		√							
CO3				√	√							√

COURSE DETAILS

COURSE NAME	Computer Organisation
COURSE CODE	**PCC CS-392**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2			√									
CO3			√		√							
CO4			√		√							

COURSE DETAILS

COURSE NAME	IT Workshop (SciLab/MATLAB/Python/R)
COURSE CODE	**PCC-CS393**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	3

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√							
CO2		√	√						√			
CO3	√		√		√							
CO4	√	√	√	√								

COURSE DETAILS

COURSE NAME	Software Engineering
COURSE CODE	**ESC-501**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2	√	√										
CO3			√		√							
CO4	√											
CO5			√	√	√						√	

COURSE DETAILS

COURSE NAME	Compiler Design
COURSE CODE	**PCC-CS501**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2			√		√							
CO3			√							√		
CO4			√	√								

COURSE DETAILS

COURSE NAME	Operating Systems
COURSE CODE	**PCC-CS502**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2		√	√	√								
CO3	√		√									√
CO4		√		√								
CO5	√	√	√	√								√

COURSE DETAILS

COURSE NAME	Object Oriented Programming
COURSE CODE	**PCC-CS503**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2			√	√								
CO3		√	√	√								
CO4			√		√							

COURSE DETAILS

COURSE NAME	Introduction to Industrial Management (Humanities – III)
COURSE CODE	**HSMC 501**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√					√					
CO2		√	√									
CO3		√								√		

COURSE DETAILS

COURSE NAME	Artificial Intelligence
COURSE CODE	**PEC-IT501B**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√	√						
CO2			√	√						√		
CO3							√					
CO4		√					√					
CO5			√	√						√		

COURSE DETAILS

COURSE NAME	Constitution of India
COURSE CODE	**MC-CS501**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1								√	√	√		√

COURSE DETAILS

COURSE NAME	Software Engineering
COURSE CODE	**ESC-591**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2	√		√		√							
CO3			√	√								
CO4	√	√										

COURSE DETAILS

COURSE NAME	Operating Systems
COURSE CODE	**PCC-CS592**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√		√									
CO2	√		√									
CO3	√		√									
CO4	√		√									

COURSE DETAILS

COURSE NAME	Object Oriented Programming
COURSE CODE	**PCC-CS593**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	5

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√				√							
CO2	√		√		√							
CO3			√	√	√							√

COURSE DETAILS

COURSE NAME	Cloud Computing
COURSE CODE	**PEC-IT701C**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2	√	√										
CO3	√						√					
CO4												√

COURSE DETAILS

COURSE NAME	Multimedia Technology
COURSE CODE	**PEC-IT702A**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√									
CO2			√	√	√							
CO3					√							
CO4			√		√						√	

COURSE DETAILS

COURSE NAME	Operation Research
COURSE CODE	**OEC-IT701A**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2		√	√									
CO3		√	√									
CO4		√										√
CO5		√	√									

COURSE DETAILS

COURSE NAME	Project Management and Entrepreneurship
COURSE CODE	**HSMC 701**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						√	√					
CO2										√	√	√
CO3		√									√	√

COURSE DETAILS

COURSE NAME	Project - II
COURSE CODE	**PROJ-IT 781**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	7

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				√					√			
CO2		√							√	√		
CO3		√	√									
CO4			√	√								
CO5							√				√	
CO6									√	√	√	

CALCUTTA INSTITUTE OF ENGINEERING AND MANAGEMENT
DEPARTMENT OF INFORMATION TECHNOLOGY
CO PO MAPPING FOR EVEN SEMESTER, 2022

PROGRAM OUTCOMES

PO-1: Engineering Knowledge:
Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2: 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.

PO-3: 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.

PO-4: 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.

PO-5: Modern tool usage:
Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO-6: 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.

PO-7: 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.

PO-8: Ethics:
Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9: Individual and team work:
Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10: 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.

PO-11: 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.

PO-12: 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.

COURSE DETAILS

COURSE NAME	Chemistry - I
COURSE CODE	**BS CH-201**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	2

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2	√											
CO3	√											
CO4	√											
CO5			√	√	√							

COURSE DETAILS

COURSE NAME	Mathematics – IIA
COURSE CODE	**BS-M201**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	2

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2	√	√	√									
CO3					√							
CO4										√		

COURSE DETAILS

COURSE NAME	Programming for Problem Solving
COURSE CODE	**ES-CS201**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	2

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2	√	√	√									
CO3	√	√	√	√	√							
CO4		√		√								

COURSE DETAILS

COURSE NAME	English
COURSE CODE	**HM-HU201**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	2

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√									√		
CO2	√											
CO3	√	√										
CO4	√	√										

COURSE DETAILS

COURSE NAME	Chemistry – I Laboratory
COURSE CODE	**BS CH-291**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	2

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√									
CO2			√	√			√					
CO3		√	√									
CO4		√	√									
CO5		√	√									

COURSE DETAILS

COURSE NAME	Programming for Problem Solving Laboratory
COURSE CODE	**ES-CS291**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	2

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2			√									
CO3			√									
CO4		√	√									
CO5			√									
CO6			√									
CO7		√	√									
CO8			√									

COURSE DETAILS

COURSE NAME	Engineering Graphics & Design
COURSE CODE	**ES-ME291**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	2

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2	√		√									
CO3	√											
CO4	√	√										

COURSE DETAILS

COURSE NAME	Language Laboratory
COURSE CODE	**HM-HU291**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	2

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2										√		
CO3		√	√									
CO4	√	√										

COURSE DETAILS

COURSE NAME	Discrete Mathematics
COURSE CODE	**PCC-CS401**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	4

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2	√	√										
CO3	√	√										
CO4	√	√										
CO5			√		√							

COURSE DETAILS

COURSE NAME	Computer Architecture
COURSE CODE	**PCC-CS402**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	4

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√		√							
CO2	√	√	√		√							
CO3	√	√	√	√	√						√	

COURSE DETAILS

COURSE NAME	Formal Language and Automata Theory
COURSE CODE	**PCC-CS403**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	4

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2		√	√									
CO3			√									
CO4				√								√

COURSE DETAILS

COURSE NAME	Design & Analysis of Algorithms
COURSE CODE	**PCC-CS404**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	4

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√										
CO2		√	√									
CO3		√	√									
CO4		√	√									
CO5		√	√									
CO6		√	√									
CO7		√			√							
CO8		√			√							

COURSE DETAILS

COURSE NAME	Biology
COURSE CODE	**BSC 401**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	4

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√		√								
CO2	√	√										
CO3		√		√								
CO4		√		√								
CO5		√	√				√					
CO6	√	√										

COURSE DETAILS

COURSE NAME	Environmental Sciences
COURSE CODE	**MC 401**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	4

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√			√	√					
CO2			√			√	√					
CO3			√		√	√	√					
CO4			√	√			√					
CO5		√	√				√	√		√		
CO6						√	√	√		√		

COURSE DETAILS

COURSE NAME	Computer Architecture Lab
COURSE CODE	**PCC-CS 492**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	4

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√	√		√							
CO2		√	√									

COURSE DETAILS

COURSE NAME	Design and Analysis of Algorithms
COURSE CODE	**PCC-CS494**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	4

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√	√								
CO2		√									√	
CO3			√		√							
CO4			√	√							√	
CO5		√	√									

COURSE DETAILS

COURSE NAME	Database Management Systems
COURSE CODE	**PCC-CS601**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	6

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√			√							
CO2		√	√	√								
CO3		√		√								
CO4		√	√									
CO5	√		√									
CO6		√				√						√

COURSE DETAILS

COURSE NAME	Computer Networks
COURSE CODE	**PCC-CS602**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	6

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√	√	√	√								
CO2		√	√	√								
CO3		√		√	√							√
CO4	√	√	√	√								

COURSE DETAILS

COURSE NAME	Image Processing
COURSE CODE	**PEC-IT601D**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	6

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√		√								
CO2									√			
CO3												√
CO4		√					√					
CO5		√					√					

COURSE DETAILS

COURSE NAME	Pattern Recognition
COURSE CODE	**PEC-IT602D**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	6

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							√					
CO2		√		√								
CO3	√				√	√					√	
CO4	√				√	√						
CO5				√								

COURSE DETAILS

COURSE NAME	Human Resource Development And Organizational Behavior
COURSE CODE	**OEC-IT601B**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	6

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				√								
CO2				√								
CO3	√				√	√					√	
CO4								√				
CO5		√										
CO6			√	√								

COURSE DETAILS

COURSE NAME	Research Methodology
COURSE CODE	**PROJ-CS601**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	6

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2				√	√							
CO3								√				
CO4						√						
CO5						√						
CO6							√					

COURSE DETAILS

COURSE NAME	Database Management System
COURSE CODE	**PCC-CS691**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	6

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√		√		√							
CO2			√		√							
CO3			√		√							
CO4			√		√							
CO5	√				√							√

COURSE DETAILS

COURSE NAME	Computer Networks
COURSE CODE	**PCC-CS692**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	6

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2	√	√										
CO3			√									
CO4			√	√								

COURSE DETAILS

COURSE NAME	**CRYPTOGRAPHY AND NETWORK SECURITY**
COURSE CODE	**PEC-IT801B**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	8

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2		√	√									
CO3		√										
CO4			√	√								

COURSE DETAILS

COURSE NAME	**BIG DATA ANALYSIS**
COURSE CODE	**OEC-IT801A**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	8

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							√					
CO2		√					√					
CO3				√								
CO4				√								
CO5				√								

COURSE DETAILS

COURSE NAME	**ECOMMERCE & ERP**
COURSE CODE	**OEC-IT802A**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	8

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		√										
CO2		√	√		√							
CO3					√							√
CO4			√	√								

COURSE DETAILS

COURSE NAME	**PROJECT-III**
COURSE CODE	**PROJ CS 881**
NAME OF THE PROGRAMME	B.Tech
DEPARTMENT	Information Technology
SEMESTER	8

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			√		√						√	
CO2					√				√			
CO3					√		√		√			
CO4								√			√	√
CO5									√	√		
CO6						√	√	√			√	√

CALCUTTA INSTITUTE OF ENGINEERING AND MANAGEMENT
DEPARTMENT OF INFORMATION TECHNOLOGY
CO ATTAINMENT REPORT
ODD SEMESTER 2021

PAPER CODE (Name)	CO No.	Course Outcomes	Attained (%)
		FIRST SEMESTER	
	CO1	Apply the knowledge of simple harmonic motion (ideal and real cases) and basic concepts of Mechanics for the solution of complex problems.	82
	CO2	Utilize the knowledge of vector calculus and different coordinate system for the solution of complex problems.	86
	CO3	Apply the knowledge of physical optics (interference, diffraction, polarization) and LASER to solve different complex problems	83
BS PH-101 **(Physics-1)**	**CO4**	Apply the knowledge of dielectric and magnetic properties of materials to interpret different complex systems.	85
	CO5	Utilize the knowledge of Quantum Physics to analyze a complex engineering problem.	83
	CO6	Apply the knowledge statistical mechanics to solve complex problems.	84
	CO1	To understand the concept and techniques of differential and integral calculus.	83
BS-M(101) **(Mathematics I(A))**	**CO2**	To understand the domain of application of MVT,to engineers problem.	84
	CO3	To learn the concept of eigen values , eigen vectors,diagonalisation	85
	CO 1	To understand and analyze basic electric and magnetic circuits.	93

ES-EE101 (Basic Electrical Engineering)	CO 2	To study the working principles of electrical machines and power converters.	94
	CO 3	To introduce the components of low voltage electrical installations.	95
BS PH-191 (Physics-I Laboratory)	CO1	Organize/design the experiment related to various systems and interpret the physical properties of material.	89
	CO2	Generate experimental Data related to electrical and magnetic properties.	93
	CO3	Conduct actual experiment related to optical phenomena.	92
	CO4	Analyze data and draw conclusion related to quantum physics.	91
	CO5	Analyze with proper experimental data and graphs and communicate effectively.	90
ES-EE 191 (Basic Electrical Engineering Laboratory)	**CO1**	Gather knowledge about the safety precautions and the do's-don'ts while dealing with electrical equipments.	94
	CO 2	Study about the different electrical instruments and devices through their input-output relationship.	95
	CO 3	Organize different electrical instruments like ammeter, voltmeter, wattmeter and different electrical devices like transformer, rheostat, etc. to observe the output through incandescent lamps.	96
ES ME 192	CO1	Utilize the concept of fitting shop and make typical jobs.	93
	CO2	Learn the basics of carpentry shop and utilize the concept to make typical jobs.	97

| (Workshop /Manufacturing Practices) | CO3 | Develop the concept of various machining processes and make use of Lathe, Shaping and Milling machine to construct typical jobs. | 96 |
| | CO4 | Develop the concept of metal joining process and utilize the concept of welding to join to metal plates. | 94 |

THIRD SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained (%)**
ESC301 (Analog & Digital Electronics)	**CO1**	Convert various number systems and apply logic gates, Boolean algebra and K-Map to design digital circuits.	94
	CO2	Design the digital combinational circuits likes decoders,encoders,multiplexers and de-multiplexers, half adder, full adder and compare their performance to optimize production cost and also develop sequential digital circuits like flip-flop, register, counter to design memory device.	95
	CO3	Design and analyse various amplifier circuit, multivibrators, ROM, RAM, FPGA,TTL,CMOS and ECL	96
PCC-CS301 (Data Structure & Algorithm)	CO1	Differentiate how the choices of data structure & algorithm methods impact the performance of program	91
	CO2	Solve problems based upon different data structure & also write programs	93
	CO3	Identify appropriate data structure & algorithmic methods in solving problem	95
	CO4	Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.	94
	CO5	Compare and contrast the benefits of dynamic	92

		and static data structures implementations	
PCC CS-302 (Computer Organization)	CO1	Analyze the relevance of classical and modern problems of computer design and construct machine code instructions.	92
	CO2	Design logical expressions and corresponding integrated logic circuits for a variety of problems including the basic components of a CPU such as adders, multiplexers, ALU using fixed-point and floating-point addition, subtraction, multiplication & division algorithm.	95
	CO3	Analyze hierarchical memory system including cache memories and virtual memory and Calculate their Cost, Speed and Capacity.	96
	CO4	Apply the knowledge of various micro-programmed instructions using the concept of pipelining for designing Control Unit and accessing I/O operation.	94
BSC-301 (Mathematics – III(Differential Calculus))	CO1	Express a logic sentence in terms of predicates,quantifiers,and logical connectives	75
	CO2	Apply the rules of interference and proof by contradiction, mathematical induction.	77
	CO3	Use tree and graph algorithm to solve the problems.	74
	CO4	Apply Boolean function ,and simplify expression	78
	CO5	To apply Boolean algebra to solve engineering problems	76
HSMC 301 (Economics for Engineers(Humanities -II))	CO1	Student will able to analyze the economic decisions making, engineering costs & estimation and classification of costs by applying the knowledge of estimating models. Student will develop an understanding of cash flow, rate of return analysis in different socio-environmental	78

		situations.	
	CO2	Analysis of inflation and price change will be done to the students for their proper understanding of the price indexes in economic analysis. Effect of inflation & deflation is analyzed to them to remember and if required to apply in real-life scenarios.	79
	CO3	Illustration of types of property, depreciation and expenses and its impact on business, for better understanding of the business environment and apply the knowledge of it.	80
ESC391 (Analog & Digital Electronics)	CO1	Organize/design the experiment related to analog electronic circuit lab.	86
	CO2	Design the digital combinational circuits likes decoders, encoders, multiplexers and de-multiplexers, half adder, full adder and compare their performance to optimize production cost.	87
	CO3	Develop sequential digital circuits like Flip-Flop, Registers, and Counters to design memory devices.	88
PCC-CS391 (Data Structure & Algorithms)	CO1	Apply the knowledge of linear data structure to implement Linked list, Stack, Queue, Array.	91
	CO2	Apply the knowledge of nonlinear data structure to implement different types of tree.	92
	CO3	Implement different types of searching and sorting techniques in data structure.	93
PCC CS-392 (Computer	CO1	Analyze the behaviour of logic gates	82
	CO2	Design combinational circuits for basic	83

Organisation)		components of computer system and applications.	
	CO3	Design arithmetic circuit for computer system.	84
	CO4	Design Arithmetic logic units and different types of memory blocks.	85
PCC-CS393 (IT Workshop (Sci Lab/ MATLAB/ Python/ R))	CO1	To master an understanding of scripting & the contributions of scripting languages	83
	CO2	Design real life problems and think creatively about solutions	86
	CO3	Apply a solution in a program using Python.	84
	CO4	To be exposed to advanced applications of mathematics, engineering and natural sciences to program real life problems.	87

FIFTH SEMESTER			
ESC-501 (Software Engineering)	CO1	Understand basic SW engineering methods and practices, and their appropriate application.	88
	CO2	Understand u of software process models such as the waterfall and evolutionary models.	87
	CO3	Students will be able perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance.	90
	CO4	Students will be able to know various processes used in all the phases of the product.	91
	CO5	Students can apply the knowledge, techniques, and skills in the development of a software product.	89
PCC-CS501 (Compiler Design)	CO1	Understand given grammar specification develop the lexical analyser	88
	CO2	Design a given parser specification design top-down and bottom-up parsers	92
	CO3	Develop syntax directed translation schemes	91
	CO4	Develop algorithms to generate code for a target machine	89
PCC-CS502 (Operating Systems)	CO1	Analyse processes and threads.	95
	CO2	Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response time.	93

	CO3	Formulate a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. Design and implement file management system.	96
	CO4	Categorize a given I/O devices and OS (specify) develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/O controllers.	92
PCC-CS503 (Object Oriented Programming)	CO1	Understand Abstract Data Types and their implementations using abstraction functions to document them.	93
	CO2	Apply the features of object-oriented design to implement encapsulation, polymorphism, inheritance, and composition of systems based on object identity.	95
	CO3	Name and apply some common object-oriented design patterns and give examples of their use.	92
	CO4	Design applications with an event-driven graphical user interface.	96
HSMC 501 (Introduction to Industrial Management (Humanities – III))	CO1	Student will able to analyze the organisation structure , organizational culture and climate by applying the knowledge of factors affecting them.	94
	CO2	Analysis of determination of critical path on network will be done to the students for their proper understanding of determination of floats, material management, storekeeping- functions.	95
	CO3	Illustration of production planning and control, value analysis and its impact on business, for better understanding of the recent trends in IM and apply the knowledge of it.	96
PEC-IT501B (Artificial Intelligence)	CO1	Apply the good programming skills to formulate the solutions for computational problems.	92
	CO2	Design and develop solutions for informed and uninformed search problems in AI.	94

	CO3	Demonstrate and enrich knowledge to select and apply AI tools to synthesize information and develop models within constraints of application area.	95
	CO4	Develop a minor project in multidisciplinary areas to demonstrate team work through reports and presentation.	91
	CO5	To design and develop an Expert System that operates in a realistic problem domain and communicate effectively in a team or individual and prepare reports.	93
MC-CS501 (Constitution of India)	CO1	To be able to identify the fundamental rights and duties, Directive Principles of State Policy in the Constitution of India by assessing the functions of various governmental administrations (Centre & State) and the Election Commission	95
ESC-591 (Software Engineering)	CO1	To understand the software engineering methodologies involved in the phases for project development.	86
	CO2	To gain knowledge about open-source tools used for implementing software engineering methods.	88
	CO3	To exercise developing product-startups implementing software engineering methods.	89
	CO4	Learn simple optimization techniques.	85
PCC-CS592 (Operating Systems)	CO1	Design and solve complex UNIX programs.	85
	CO2	Apply the knowledge of process and threads.	86
	CO3	Design and formulate inter process communication through programming.	87
PCC-CS593 (Object Oriented Programming)	CO1	Implement features of object-oriented design such as encapsulation, polymorphism, inheritance, abstraction.	89
	CO2	Implementing multithreading concept in object oriented programming.	90
	CO3	Design applications with an event-driven graphical user interface.	91

				SEVENTH SEMESTER		

PEC-IT701C (Cloud Computing)	CO1	Explain the core concepts of the cloud computing paradigm, Cloud classification, Characteristics of Cloud Computing, different cloud models	92
	CO2	Discuss concepts of Abstraction and Virtualization technologies, Load Balancing, Hypervisors, compare different service models	95
	CO3	Lifecycle management of cloud services, Concepts of Cloud Security	96
	CO4	Discuss basic concept of Service Oriented Architecture, Applications in the Cloud, Cloud-based Storage	93
PEC-IT702A (Multimedia Technology)	CO1	Apply the knowledge of the diverse functions of Multimedia systems and its related hardware and software for the solution of problem related to Information Technology.	78
	CO2	Apply the knowledge of text, audio, image and video file formats for enhancement of the text, audio, image and video with using text, audio, image and video processing tools for the solution of a complex problem related to text, audio, image and video in the field of Information Technology.	82
	CO3	Able to use various types of multimedia data storage devices for storage & retrieval of multimedia data.	81
	CO4	Design different types of multimedia applications like video-on-demand, video conferencing, digital libraries and other industrial applications.	79
OEC-IT701A (Operation Research)	CO1	Solve linear programming problems using appropriate techniques and optimization solvers, interpret the results obtained.	91

	CO2	Determine optimal strategy for Minimization of Cost of shipping of products from source to Destination/ Maximization of profits of shipping products using various methods, Finding initial basic feasible and optimal solution of the Transportation problems	95
	CO3	. Optimize the allocation of resources to Demand points in the best possible way using various techniques and minimize the cost or time of completion of number of jobs by number of persons	94
	CO4	Model competitive real-world phenomena using concepts from game theory. Analyse pure and mixed strategy games	93
	CO5	. Formulate Network models for service and manufacturing systems, and apply operations research techniques and algorithms to solve these Network problems	92
HSMC 701 (Project Management and Entrepreneurship)	CO1	Student will able to analyze the concept of innovation and entrepreneurship, contributions of entrepreneurs to the society, risk-opportunities perspective by applying the knowledge of factors affecting them.	90
	CO2	Analysis of project management, issues and problems in project management, project life cycle - initiation / conceptualization phase, determination of project feasibility studies will be done to the students for their proper understanding of social cost benefit analysis.	91
	CO3	Identification and illustration of the critical path and its significance, types of floats and slacks and its impact on business, for better understanding of the recent trends and apply the knowledge of it.	92
PROJ-IT 781	CO1	To survey the literature; Identify and classify the requirements for the solution of complex	81

(Project - II)		engineering problems.	
	CO2	To define the requirements of the project by proper analysis and interpretation of data and processes supported by standard documentation.	85
	CO3	To analyze the processes by mapping requirements in to Use case diagram(s)/ Data Flow Diagram(s)/ Algorithm(s)/ User-Interface design/ Entity Relationship Diagram(s) etc.	82
	CO4	To design behaviour of the application with modular programming and program flowchart/ class diagrams and sequence diagrams, etc.,following standard guidelines.	84
	CO5	To estimate project metrics like size, effort and cost , reliability and quality, etc and plan project development schedule using PART and GNATT charts.	87
	CO6	To justify the project work with technical documentation, presentation, and discussions as a group to share knowledge.	80

PAPER CODE (Name)	CO No.	Course Outcomes	Attained (%)
SECOND SEMESTER			

PAPER CODE (Name)	CO No.	Course Outcomes	Attained (%)
BS CH-201 **(CHEMISTRY-I)**	**CO1**	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces to solve different engineering problems.	69
	CO2	Rationalise bulk properties and processes using thermodynamic consideration for various engineering applications.	72
	CO3	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.	78
	CO4	Rationalise periodic properties (ionization potential, electro negativity, oxidation states) for various engineering applications.	81
	CO5	Apply the knowledge of structure, stability and reactivity of organic molecular species in order to gain a clear insight into the mechanism of chemical and biochemical reacting systems used in various engineering problems.	82
BS-M201 **(Mathematics-IIA)**	**CO1**	To understand the concept of basic probability,including sample spaces,events,probability distribution,and conditional probability.	90
	CO2	Apply probability theory and statistical interference to solve engineering problems.	75
	CO3	Use statistical software and tools to analyze the data.	70
	CO4	Able to communicate their findings and results through written reports,and visual display	85
	CO1	Design Algorithm, flow chart and program in C.	

			70
ES-CS201 (PROGRAMMI NG FOR PROBLEM SOLVING)	**CO2**	Apply logical operators and loops in programming.	60
	CO3	Construct arrays using the concept of C programming.	70
	CO4	Analyze how to use arguments and return values and variables from a function.	65
	CO5	Use pointers for direct memory access and manipulation in C; and how to change the memory address contained within a pointer;	70
	CO6	Apply the programming concepts for manipulating strings in C and file handling.	60
HM-HU201 (ENGLISH)	**CO1**	To be able to **use** the correct vocabulary in order to express oneself in English properly	62
	CO2	To be able to **identify** common errors in terms of grammar and choice of words in English	58
	CO3	To be able to **describe**, **discuss**, and **interpret** reading input in English	75
	CO4	To be able to **demonstrate** that one can express oneself in English through writing	64
BS CH-291 (CHEMISTRY-	**CO1**	Organize/Design the experiment related to Chemical Science as applicable in various Engineering problems.	72
	CO2	Generate experimental Data related to Chemical Science as applicable in complex problems.	78
	CO3	Conduct actual experiment related to Chemical Science as applicable in different engineering application.	83
	CO4	Analyze data and draw conclusion related to Chemical Science as applicable in various engineering	76

I)		problems.	
	CO5	Analyze with proper experimental data and graphs and communicate effectively related to Chemical Science as applicable in different engineering fields.	84
ES-CS291 **(PROGRAMMI NG FOR PROBLEM SOLVING)**	**CO1**	To formulate the algorithms for simple problems	90
	CO2	To translate given algorithms to a working and correct program	90
	CO3	To be able to correct syntax errors as reported by the compilers	80
	CO4	To be able to identify and correct logical errors encountered at run time	85
	CO5	To be able to write iterative as well as recursive programs	90
	CO6	To be able to represent data in arrays, strings and structures and manipulate them through a program	80
	CO7	To be able to declare pointers of different types and use them in defining self-referential structures.	75
	CO8	To be able to create, read and write to and from simple text files	80
ES-ME291 **(Engineering**	**CO1**	Develop basic knowledge of engineering drawing including lettering, dimensioning and scaling system.	75
	CO2	Develop basic knowledge on geometrical constructions and curves and apply the knowledge to solve real life problems.	70

Graphics & Design)	**CO3**	Learn the basic concept of orthographic and isometric projections related to design of engineering.	65
	CO4	Comprehend the basic knowledge of development of different types of surfaces and analyse their real-life applications.	65
HM-HU291 (LANGUAGE LABORATORY)	**CO1**	To be able to **describe, discuss**, and **interpret** the listening input in English	55
	CO2	To be able to **demonstrate** that one can express oneself in English through speaking	54
	CO3	To be able to **describe, discuss,** and **interpret** reading input in English	77
	CO4	To be able to **demonstrate** that one can express oneself in English through writing	67

FOURTH SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained (%)**
PCC-CS401 **(DISCRETE MATHEMATIC S)**	**CO1**	To understand the basic concept of set,relation ,mapping	75
	CO2	To understand the POSET,Lattice	80
	CO3	To understand the basic concept of number theory.	75
	CO4	To understand graphs,cycle,trail,path	80
	CO5	To apply the graph colouring,chromatic number to solve engineering problems.	75
PCC-CS 402 **(COMPUTER ARCHITECTU RE)**	**CO1**	To learn the basics of stored program concepts.	75
	CO2	To learn the principles of pipelining	85
	CO3	To learn mechanism of data storage	80
	CO4	To distinguish between the concepts of serial, parallel, pipeline architecture	70
	CO1	Familiarize with formal notation for strings, languages and machines and Design finite automata to accept a set of strings	70

		of a language.	
PCC-CS403 **FORMAL LANGUAGE AND AUTOMATA THEORY**	**CO2**	Design hierarchy of formal languages, grammars and machines and Determine whether the given language is regular or not	65
	CO3	Design context free grammars to generate strings of context free language and Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars	75
	CO4	Distinguish between computability and non-computability and Decidability and undecidability	65
PCC-CS404 **DESIGN & ANALYSIS ALGORITHM,**	**CO1**	For a given algorithms analyse worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.	85
	CO2	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For a given problem develop the greedy algorithms.	75
	CO3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.	70
	CO4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. For a given problems of dynamic-programming.	80
	CO5	Develop the dynamic programming algorithms, and analyse it to determine its computational complexity.	85
	CO6	For a given model engineering problem model it using graph and write the corresponding algorithm to solve the problems.	70
	CO7	Explain the ways to analyse randomized algorithms (expected running time, probability of error).	70
	CO8	Explain what an approximation algorithm is. Compute the approximation factor of an approximation algorithm (PTAS and FPTAS).	65
	CO1	Describe how biological observations of 18th century lead to major discoveries and understand that the classification of organisms is based on morphological,	82%

			biochemical or ecological parameters.	
BSC 401 **(BIOLOGY)**	**CO2**		Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offering.	81%
	CO3		Convey that all forms of life have the same building blocks and yet the manifestations are diverse.	78%
	CO4		Classify enzymes and distinguish between different mechanisms of enzyme action and identify DNA as a genetic material in the molecular basis of information transfer.	83%
	CO5		Analyse biological processes at the reductionistic level and apply thermodynamic principals to the biological systems.	75%
	CO6		Identify and classify microorganisms.	79%
MC 401 **(ENVIRONME NTAL SCIENCES)**		**CO1**	To apply the knowledge of air pollution in order to develop improved technologies to reduce the adverse effect of pollution on human health and environment.	80
		CO2	To apply the knowledge of water pollution in order to develop improved technologies for controlling water pollution and provide safe and clean drinking water to the society.	82
		CO3	To apply the knowledge of solid waste management in order to develop technologies for reducing, reusing and recycling the waste for the benefit of the society.	84
		CO4	To apply the knowledge of ecology for understanding the complex interrelationships between the biotic and abiotic components in different types of eco systems in order to ensure sustainable development and growth.	80
		CO5	To identify and solve problems related to noise pollution and create awareness among people about its harmful effects and control measures.	88

PAPER CODE (Name)	CO No.	Course Outcomes	Attained (%)
	CO6	To foster greater community involvement and create social awareness about the important national and international legislations and protocols concerning the protection and conservation of environment.	89
PCC-CS 492 **(COMPUTER ARCHITECTU RE)**	**CO1**	Practical experience on Xlinx	95
	CO2	Analyze the operational behaviour and applications of various gates, sequential and combinational circuits.	85
PCC-CS494 **(DESIGN & ANALYSIS ALGORITHM)**	**CO1**	Implement Divide and Conquer programming method with different examples	85
	CO2	Demonstrate Brunch and Bound programming method with different example	70
	CO3	Execute Backtracking programming method with different examples	70
	CO4	Demonstrate Greedy programming method with different examples	75
	CO5	Implement Graph Traversal Algorithm with different examples	60
SIXTH SEMESTER			
PAPER CODE (Name)	**CO No.**	**Course Outcomes**	**Attained (%)**
	CO1	Apply the knowledge of pure query language to write a query in relational algebra, relational	80

PCC-CS601 **(DATABASE MANAGEMENT SYSTEMS)**		calculus and construct the SQL queries for Open source and Commercial DBMS like MYSQL, ORACLE, and DB2. .	
	CO2	Apply the knowledge of entity relationship models to design the database for a given requirement specification.	75
	CO3	Apply the knowledge of query optimization algorithms to optimize the execution time of a query.	70
	CO4	Apply the knowledge of reducing anomalies during database design.	75
	CO5	Understand the transaction atomicity, consistency, isolation, durability for a given transaction-processing system and implement the isolation property based on concurrency control and serializability of scheduling.	70
	CO6	Understand different processes to secure the database.	65
PCC-CS602 **(COMPUTER NETWORKS)**	CO1	Illustrate of modern network architectures from a design and performance perspective.	70
	CO2	Justify the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).	70
	CO3	Derive Topologies for the enhancement of OSI/ TCP IP protocol suite.	75
PEC-IT601 D **(IMAGE PROCESSING)**	**CO1**	Explain the fundamentals of digital image and its processing.	70
	CO2	Perform image enhancement techniques in spatial and frequency domain.	72
	CO3	Elucidate the mathematical modelling of image restoration and compression.	80
	CO4	Apply the concept of image segmentation.	60

	CO5	Describe object detection and recognition techniques.	75
PEC-IT602D **(PATTERN RECOGNITION)**	CO1	Explain and compare a variety of pattern classification, structural pattern recognition and pattern classifier combination techniques.	60
	CO2	Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.	70
	CO3	Apply performance evaluation methods for pattern and critique comparisons of techniques made in the research literature.	75
	CO4	Apply pattern recognition techniques to real-world problems such as document analysis and recognition.	70
	CO5	Implement simple pattern classifiers, classifier combinations and structural pattern recognizers.	60
OEC-IT601B **(HUMAN RESOURCE DEVELOPMENT AND ORGANIZATIONAL BEHAVIOR)**	CO1	Critically assess existing theory and practice in the field of HRM.	75
	CO2	Develop an ability to undertake qualitative and quantitative research.	60
	CO3	Apply knowledge about qualitative and quantitative research to an independently constructed piece of work.	70
	CO4	Respond positively to problems in unfamiliar contexts.	75
	CO5	Identify and apply new ideas, methods and way of thinking.	60
	CO6	Demonstrate competence in communicating and exchanging ideas in a group context.	60
	CO1	Understand research problem formulation.	78
	CO2	Analyze research related information	82
	CO3	Follow research ethics	67
	CO4	Understand that today's world is controlled by Computer, Information Technology, but	79

PROJ - CS601 **(RESEARCH METHODOLOGY)**		tomorrow's world will be ruled by ideas, concepts, and creativity.	
	CO5	Understanding that when IPR would take such an important place in the growth of individuals & nations, it is needless to emphasize the need for information about Intellectual Property rights to be promoted among students in general & engineering in particular.	75
	CO6	Understanding that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about economic growth and social benefits.	85
PCC-CS691 **(DATABASE MANAGEMENT SYSTEMS)**	CO1	Apply the knowledge of pure query language to write a query in relational algebra, relational calculus and construct the SQL queries for Open source and Commercial DBMS like MYSQL, ORACLE, and DB2. .	80
	CO2	Apply the knowledge of entity relationship models to design the database for a given requirement specification.	75
	CO3	Apply the knowledge of query optimization algorithms to optimize the execution time of a query.	70
	CO4	Apply the knowledge of reducing anomalies during database design.	75
	CO5	Understand the transaction atomicity, consistency, isolation, durability for a given transaction-processing system and implement the isolation property based on concurrency control and serializability of scheduling.	70
	CO6	Understand different processes to secure the database.	65
	CO1	Understand the structure and organization of	90

PCC-CS692 (COMPUTER NETWORKS)		CO No.	Course Outcomes	Attained (%)
			computer networks; including the division into network layers, role of each layer, and relationships between the layers, various network command, and network device.	
		CO2	Understand IPAddressing, Subnetting.	90
		CO3	Understand of transport layer concepts and protocol design; including connection oriented and connection-less models, techniques to provide reliable data delivery and algorithms for congestion control and flow control.	90
		CO4	Understand of Application layer concepts and protocol design.	80

EIGHTH SEMESTER			
PAPER CODE (Name)	CO No.	Course Outcomes	Attained (%)
PEC-IT801B (CRYPTOGRAPHY AND NETWORK SECURITY)	CO1	Analyze the security of different computer systems & networks	80
	CO2	Identify the appropriate cryptography scheme & security mechanism for different computing environment and information systems	80
	CO3	Identity security weaknesses in different networking environment	81
	CO4	Design & Evaluate the quality of algorithms to identify and investigate network security threats	85
OEC-IT801A (BIG DATA ANALYSIS)	CO1	Describe big data and use cases from selected business domains	55
	CO2	Explain NoSQL big data management	50
	CO3	Install, configure, and run Hadoop and HDFS	60
	CO4	Perform map-reduce analytics using Hadoop	55

	CO5	Use Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data analytics	50
OEC-IT802A **(ECOMMERCE & ERP)**	CO1	Analyze the impact of E-Commerce on business models like B2B, B2C, C2C & B2G and business strategies.	84
	CO2	Able to use Electronic Data Interchange for E-Business transactions (order, delivery, invoice).	65
	CO3	Apply the electronic payment systems like debit card, credit card, online fund transfer for E-Payments.	75
	CO4	Design E-Business applications like Internet Bookshop, Software Supplies & Support, Electronic Newspapers, Internet Banking, Virtual Auction, Gambling etc.	72
PROJ CS 881 **(PROJECT-III)**	**CO1**	To determine the software and hardware requirements from implementation perspective of Project-II	78
	CO2	To interpret the system design of project-I in to executable code(s) using modern programming languages to Build the system.	82
	CO3	To test and validate the developed system following standards testing techniques.	81
	CO4	To adapt the management techniques to handle a project as a whole.	80
	CO5	To justify the project work with technical documentation, presentation, and discussions as a group to share knowledge.	82
	CO6	To determine all the system developments phases towards the completion of the Project and analyze/compare the result(s); evaluate and maximize system performances which contribute to lifelong	85

		learning.	

2020 odd semester

Subject Code & Subject Name	CO	Attainment
MB 101 Managerial Economics (Micro)	CO1:To explain and demonstrate the diff types of markets and their features – determination under different markets along other concepts like Law of Variable Propor and Returns to Scale, Producers equilibrium the help of Isoquants, Expansion path Elasticity of Substitution.	83%
	CO2: To acquire knowledge and develop ideas these concepts in detail and analyse the applicability in real life situations.	85%
MB 102 ORGANIZATIONAL BEHAVIOUR	CO1 : The student will be able to evaluate and analyse the various facets of organisationbehaviour including personality, perception, and attitude and job satisfaction.	95%
	CO2: The student will be able to understand the various organisation theories and analyse group behaviour, conflict, change and leadership concepts.	85%
MB 103 Business Communication	CO 1 To demonstratecompetenceinverbalbusinesscommunication &"ProcessofCommunicationinanorganization"	83%
	CO2 To demonstratecompetenceinthefundamentalsof business writing & willenablethestudentstoaugmenttheirreportwritingskills	84%
	CO3 Itwillhelpthemtoidentifythe'BarriersofCommunication and measures to overcome.	83%

	CO4 Itwillenable themtoapply the expertise to frame professional cover letter and professional resume.	82%
MB 104	CO1: Student will develop an understanding of different conditions & warranties, the passing of ownership rights by applying the knowledge of the Sale of goods Act and different types of negotiable instruments in different socio environmental situations.	79%
	CO2: Analysis of companies formation, memorandum, articles, and prospectus will be done to the students for their proper understanding of the Companies Act. Consumer protection act is analyzed to them for them to remember and if required to apply in real-life scenarios.Illustration of inflation and its impact on business, unfair trade practice for better understanding of the business	82%
MB 105	CO1 Students will be able to contemplate the ethical standards to be maintained in professional set ups.	85%
	CO2 Students will be able to analyze Indian values related to business enterprises and merge them with relevant global concepts	85%
	CO3 Students will be able to analyze Indian values related to business enterprises and merge them with relevant global concepts	85%
	CO4 Students will be able to emerge as successful Managers/ leaders and lead a bright life.	86%
MB 106	CO1 Understanding the concept of business or industry related operational problems and then applying the knowledge of Operations	65%

| | Research to solve those problems. | |
| | CO2 Understanding the concept of Probability and Statistics to analyze the problems of Business processes. | 65% |

3rd Semester

Subject Code & Subject Name	CO	Attainment
MB 301 ENTREPRENEURSHIP & PROJECT MANAGEMENT	CO1 : Understand the concept of management, Organization, planning, Staffing and learn the Project evaluation, termination, and controlling process	72%
	CO2: To evaluate the role of entrepreneurs in economic development, and barriers, Identification of business opportunities, and feasibility studies.	69%

MB 302 Corporate Strategy	CO1To understand and apply the methods of environmental scanning, strategic planning techniques & formulation strategies for holistic strategic management in organization.	81%
	CO2 To analyze and evaluate the strategic actions, strategic implementation and evaluation strategies.	83%
HRM 301 TEAM DYNAMICS AT WORK	CO1: The student will be able to understand the meaning of group dynamics and evaluate the concepts and theories behind the group formations including the Schachter Study and its implications.	72%
	CO2: The student will be able to evaluate effective team building strategies and apply knowledge in solving contemporary issues related with teams in modern organisations	69%
HRM 304 Organizational Design	CO1: To apply organization theory for better understanding of organizational structure and design	83%
	CO2: To analyze different organizational models	82%

	for reshaping organizations.	
MM 302: Digital & Social Media Marketing	CO1: To explain the understanding of digital & social media marketing plan that will address common marketing challenges	81%
	CO2: Applying concepts, approaches & the practical aspects of various digital & social media marketing tools like SEO, Paid Search, Social, Mobile, Email & Display media & marketing analytics	81%
	CO3: Analyze key performance indicators tied to any digital & social Media program & Develop return on investment model for any digital & social marketing program	78%
	CO4: Apply creative ideas or evolve with	82%

	existing ideas for development of effective digital & social marketing communication	
MM 303 :Integrated Marketing Communication	CO1: To explain the understanding of essential concepts & techniques for the development & designing of an effective IMC program	82%
	CO2: Applying concepts, approaches & the practical aspects of various communication tools	82%
	CO3: Analyze effectiveness of different IMC tools for business firms	77%
	CO4: Apply creative ideas for development of effective marketing communication	82%
FM 302 Project Appraisal and Finance	CO1: To define the P life cycle, the role stakeholders and p management processes to explain the concep project specificat financial projections, and team in P management.	77%

	CO2: To describe and evaluate the risks involv... in projects and associate... costs as demonstrate the... control and closure proc... related to project management.	75%
FM 304 Corporate Finance	CO1:To define and discuss the concepts & theories related to financial management.	77%
	CO2:To describe and apply the various theories, tools and techniques of Corporate Finance to resolve real life financial problems	75%

2021 Even Semester

2ND Semester

Subject Code & Subject Name	CO	Attainment
MB 201 Indian Economy and Policy	CO1: To Explain and design concepts of circular flow, theo... income determination, infl... unemployment, LPG model, as... as banking, trade policy... monetary reforms.	85%
	CO2: To Develop ideas of the I... Economy and grasp the importa... of planning undertaken by the government of India.	83%

MB 202 Financial Reporting, Statement and Analysis	CO1: To explain the understa[n] of the concepts and apply the practical life like basic fina[ncial] accounting concept, preparing b[ooks] of accounts, introduction [to] Accounting Standard, preparati[on of] financial statements and its anal[ysis]	71%
	CO2: To Summarize the fina[ncial] transactions in terms of Fina[ncial] Statements and interpret Fina[ncial] Statements by using diff[erent] financial tools and techniques.	74%
MB 203: Marketing Management	CO1: To identify & analyze the scope & significance of marketing in Domain Industry	80%
	CO2: To Analyze & examine marketing concepts & phenomenon to current business events in the industry	79%
	CO3: Map the various marketing environment variables & demonstrate them for designing marketing strategies for business firms	80%
	CO4: Demonstrate market analysis skill for developing innovative marketing strategies for firms	79%
MB 204 OPERATIONS MANAGEMENT	CO1 : To understand the suitable control technique in stores, Inventory, and vendor management is adopted for the production is identified.	78%

	CO2: To analyze the scheduling techniques applied in the operations were learned by the students	80%
MB 205 : MANAGEMENT INFORMATION SYSTEM	CO1 : To identify the technologies and methods used for effective decision-making in an organization	85%
	CO2:Make students understand the concepts and terminologies used in Database Management, Systems, SQL, Concurrency Management, and the extended part of data storage technology,Data Warehousing.	85%
MB 206 HUMAN RESOURCE MANAGEMENT	CO1: The student will be able to understand and apply the various concepts behind Human Resource Management and development including planning, Performance Appraisal Systems and strategic HR management	93%
	CO2: The student will be able to understand and apply the theories and strategic concepts behind compensation Management, Industrial Relations and discipline including workers participation in management.	93%

4th Semester

Subject Code & Subject Name	CO	Attainment
HR 401 MANPOWER PLANNING, RECRUITMENT& SELECTION	CO1: Student will be able to understand and analyze the various manpower planning mechanisms in an organization including forecasting techniques, management information systems and human resources audits.	82%

	CO2: Student will be able to apply and exercise various HRM implementation strategies including recruitment and solve case studies pertaining to real life organisational issues and situations.	74%
HR402Employee Relations &Labour Laws	CO1:To understand EPM,WPM ,concept of collective bargaining,trade unionism in India	84%
	CO2:To apply the various labour legislations in real life industrial scenario	79%
HR 404Performance Management System	CO1: To identify and apply performance planning ,monitoring, appraisal techniques & strategies for better performance management.	83%
	CO2: To understand balance scorecard, competency mapping for application in reward management, employee engagement and potential appraisal	82%
HR 406 INTERNATIONAL HRM	CO1: Student will be able to understand International human resources management and development including the recruitment processes of such	86%

	candidates.	
	CO2: The student will be able to remember and apply legislative measures meant for industrial relations, HRM ,CSR and employee representation in the international sector and create compensation plans commensurate with the same.	77%
MM 401	CO1:Analysis consumer behaviour and its Impact on marketing strategies. Illustration of consumer decision process.Studednts will be understanding demographic and psychographic characteristics and market segmentation.Analysis of the relation between consumer perception with marketing stimuli.Students will learn to apply the knowledge of consumer motivation for marketing strategy and its relation with corporate social responsibility.	82%
	CO2: Students will develop the understanding of characteristics and functions of attitude, cross-cultural understanding of consumer behaviour and data analysis for	84%

	consumer feedback researches.Students will comprehend and write effective technical reports. They will be able to analyse case studies,explain relevant materials,communicate effectively, identify the appropriate key words,use grammatically correct English for documentation.	
MM 403: Sales & Distribution Management	CO1: To explain the understanding of sales & distribution processes in Organization	77%
	To get familiarized with concepts, approaches & the practical aspects of the key decision-making variables in sales management & distribution channel management	75%
	CO3: To explain market analysis methods & selling concepts	78%
	CO4: To develop Performance evaluation methods, ethics, trends in sales & distribution management	76%
MM 404: Service Marketing	CO1: To explain the	77%

	understanding of types, nature, classification & marketing mix of service marketing	
	CO2: Analyze service product concept, branding & service positioning that transforming service marketing to a great extent	75%
	CO3: To explain market analysis methods of service marketing	78%
	CO4: Demonstrate the role of identifying the people in service & the role of customer in service delivery	76%
MM 406: International Marketing	CO1: To explain the understanding of global business activities, marketing processes in international business	77%
	To get familiarized with concepts, approaches & the practical aspects of the key decision-making variables & global forces that transforming international marketing	75%

	CO3: To develop general perspective about managing international marketing	76%
	CO4: To develop evaluation methods for International Marketing both in operational as well as strategic context	78%
FM 401 Investment Analysis & Portfolio Management	CO1To explain the understanding of the concept and apply them like portfolio diversification, Construction, portfolio management, portfolio revi portfolio evaluation, portfolio protec and portfolio performance measures.	77%
	CO2To implement strategies to make an impact on the students in taking investment decisions, and properly manage the portfolio.	75%
FM402 Managing Banks & Financial Institutions	CO1To explain the understanding of the concep and apply them like banking industry models, b support mechanism, Basel committee I & II, interest ra risk management, liquidity management and credit risk management.	80%
	CO2 Evaluate and analyse the fundamentals & technical aspects of managing banks and financial institutions.	79%
FM405International Finance	CO1To explain the understanding of the concepts and apply them like international financial management,	75%

	international monetary System, balance of payments, exchange rate determination and foreign exchange market.	
	CO2Evaluate and analyse the fundamentals & technical aspects of International financial market.	72%
FM406 Financial Markets and Services	CO1To Discuss the Indian Financial System and multiplicity of Financial Instruments and understand the Indian finan system, money market, secondary market, SEBI, m Funds and credit rating agencies.	76%
	CO2 Examine Mutual Fund Merchant Banking under th nodal agency SEBI.	80%