



BENGAL COLLEGE OF ENGINEERING & TECHNOLOGY

Shahid Sukumar Banerjee Sarani, Bidhan Nagar
Durgapur-713212 West Bengal, India
Department of Computer Science Engineering

(SEMESTER –I)

Course Name : Mathematics –IA (BS-M101) Year of Study: 2025-26;

Course Title: Mathematics –IA	Code:BS-M101
Type of Course: Theory	Course Designation: Compulsory
Semester: 1 st	Contact Hours: 3L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
BS-M101.CO1	Introduce the concepts of differential calculus including mean value theorems and Taylor/Maclaurin series to deal with the problems of engineering and optimization problems.	Introduce	K2
BS-M101.CO2	Understand definite and improper integrals, surface areas and volumes of solids of revolution.	Understand	K2
BS-M101.CO3	Apply concepts of matrices, including operations, rank, and inversion to the systems of linear equations.	Apply	K3
BS-M101.CO4	Analyze vector spaces, basis, dimension, and linear transformations, Rank-Nullity theorem.	Analyze	K4
BS-M101.CO5	Evaluate eigen values and eigenvectors for square matrices and Develop the concept of diagonalization and inner product spaces for practical applications in engineering.	Evaluate, Develop	K5,k6

Course Name: Physics-I (BS-PH101) Year of Study: 2025-26;

Course Title: Physics-I	Code:BS-PH101
Type of Course: Theory	Course Designation: Compulsory
Semester: 1 st	Contact Hours: 3L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

Course Outcomes	Details	Action Verb	Knowledge Level
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BS-PH101.CO1	State and apply the basic concepts of mechanics	State, Apply	K1, K3
BS-PH101.CO2	Discuss Physical optics and Explain principles of lasers with applications	Discuss, Explain	K2
BS-PH101.CO3	Describe and classify Dielectric and Magnetic properties of materials, Evaluate Maxwell's equations .	Describe, Evaluate	K2,K5
BS-PH101.CO4	Differentiate Classical Physics and Quantum Physics by Introducing Planck's law	Differentiate	K4
BS-PH101.CO5	Explain wave particle duality , Davisson-Germer experiment and Compare different statistics for particles.	Explain, Compare	K2,K4

On completion of the course students will be able to

Course Name: Basic Electrical Engineering (ES-EE101)Year of Study: 2025-26;

Course Title: Basic Electrical Engineering	Code:ES-EE101
Type Of Course: Theory	Course Designation: Compulsory
Semester: 1st	Contact Hours: 3L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ES-EE101.CO1	Understand and apply basic laws and theorems in DC and AC circuits.	Understand, apply	K2, K3
ES-EE101.CO2	Analyze AC circuits using phasor; evaluate power and resonance conditions.	Analyze	K4
ES-EE101.CO3	Explain and analyze the working principles and characteristics of transformers.	Explain, analyze	K2, K4
ES-EE101.CO4	Evaluate and describe construction, operation, and control of electrical machines.	Discover, Determine	K4, K5
ES-EE101.CO5	Apply power electronics basics for converters and inverters and Estimate energy consumption and design simple electrical installations with safety.	Apply, Design	K3,k6

Course Name: Physics-I Laboratory (BS-PH191)Year of Study: 2025-26;

Course Title: Physics-I Laboratory	Code:BS-PH191
Type of Course: Practical	Course Designation: Compulsory
Semester: 1st	Contact Hours: 3P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
BS-PH191.CO1	Recall facts and read data in slide calliper's, screw gauge. Calculate different modulus of elasticity and coefficient of viscosity of water by applying basic knowledge of Physic.	Recall	K1
BS-PH191.CO2	Implement sequential connection in electrical experiment to verify Kirchhoff's law and related phenomena.	Implement	K3

BS-PH191.CO3	Organize optical instruments to illustrate physical properties of light and to observe spectral lines of light. Examine Hydrogen spectrum and calculate Rydberg constant by studying Hydrogen spectrum .	Organize, Examine	K4, K3
BS-PH191.CO4	Evaluate Band Gap and Hall coefficient of a given intrinsic semiconductor and distinguish between different intrinsic semiconductors. Determine the dielectric constant of different dielectric materials and their usage in capacitors.	Evaluate, Distinguish	K5, K4
BS-PH191.CO5	Investigate the values of Planck's const and stefan's constant applying modern Physics.	Investigate	k6

Course Name: Basic Electrical Engineering Lab (ES-EE191)Year of Study: 2025-26;

Course Title: Basic Electrical Engineering Lab	Code: ES-EE191
Type of Course: Practical	Course Designation: Compulsory
Semester: 1st	Contact Hours: 2P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ES-EE191.CO1	Understand basic electrical safety, and correctly handle lab instruments.	K2	Understand
ES-EE191.CO2	Identify and operate electrical components (resistors, capacitors, inductors, machines, etc.).	K3	Apply
ES-EE191.CO3	Calibrate instruments and perform measurements on electrical circuits.	K4	Analyze
ES-EE191.CO4	Evaluate performance of single-phase and three-phase transformers.	K5	Evaluate
ES-EE191.CO5	Interpret torque-speed characteristics of DC and Induction motors. And Demonstrate the application of converters and LT switchgear components.	K4,K2	Analyze, Demonstrate

Course Name: Workshop (ES-ME192) Year of Study: 2025-26;

Course Title: Workshop	Code:ES-ME192
Type Of Course: Practical	Course Designation: Compulsory
Semester: 1st	Contact Hours: 1L+4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ES-ME192.CO1	Build through knowledge of various tools, machines, devices used in engineering practice.	Understand	K2
ES-ME192.CO2	Acquire thorough knowledge of carrying out various operations in mechanical engineering workshop.	Apply	K3
ES-ME192.CO3	Utilize measuring skills gained in workshop practice	Create	K6
ES-ME192.CO4	Students are able to demonstrate the various hand tools used	Understand	K2

	in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.		
ES-ME192.CO5	Practical knowledge of the dimensional accuracies and dimensional tolerances possible with different Manufacturing processes and Produce small devices of their interest, by assembling different components.	Evaluate	K5

(SEMESTER –II)

Course Name: Chemistry-I (BS-CH 201) Year of Study: 2025-26;

Course Title: Chemistry-I	Code: BS-CH 201
Type of Course: Theory	Course Designation: Compulsory
Semester: 2nd	Contact Hours: 3L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
BS-CH 201.CO1	Explain fundamental principles of atomic and molecular structure, including Schrödinger's equation, molecular orbital theory, and crystal field theory.	Understand	K2
BS-CH 201.CO2	Apply spectroscopic techniques such as electronic, vibrational, and NMR spectroscopy to analyze molecular structure and chemical properties.	Apply	K3
BS-CH 201.CO3	Analyze intermolecular forces and predict physical properties of substances.	Analyze	K4
BS-CH 201.CO4	Evaluate chemical equilibria using thermodynamic principles and apply the Nernst equation to electrochemical systems.	Evaluate	K5
BS-CH 201.CO5	Compare periodic properties of elements and predict their physical and chemical behaviour.	Compare	K4

Course Name: Mathematics –IIA (BS-M201)Year of Study: 2025-26;

Course Title:Mathematics –IIA	Code: BS-M201
Type of Course: Theory	Course Designation: Compulsory
Semester: 2nd	Contact Hours: 3L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
BS-M201.CO1	Recall and explain fundamental concepts of probability, random variables, and standard distributions such as Binomial, Poisson, and Normal.	Remember	K1
BS-M201.CO2	Interpret and compute probabilities for discrete and continuous random variables using appropriate probability distributions.	Apply	K3
BS-M201.CO3	Analyze concepts of joint, marginal, and conditional distributions to solve problems involving multiple random variables.	Analyze	K4
BS-M201.CO4	Evaluate data using statistical measures such as mean, variance, skewness, and kurtosis, and evaluate the fit of data to theoretical distributions.	Evaluate	K5
BS-M201.CO5	Relate appropriate statistical tests (e.g., t-test, chi-square test, F-test) to draw conclusions from sample data, and design basic hypothesis testing models.	Analyze	K4

Course Name: Programming for ProblemSolving (ES-CS201) Year of Study: 2025-26;

Course Title: Programming for ProblemSolving	Code: ES-CS201
Type of Course: Theory	Course Designation: Compulsory
Semester: 2 nd	Contact Hours: 3L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ES-CS201.CO1	Understand simple algorithms for arithmetic and logical problems, Translate the algorithms to programs in C language.	Understand	K2
ES-CS201.CO2	Execute, test and interpret correct syntax and logical errors in conditional branching and looping, with iteration Vs recursion.	Execute	K3
ES-CS201.CO3	Define array, string and functions to synthesize problem formulation.	Define	K1
ES-CS201.CO4	Differentiate between different programming tools and techniques in (control structures ,recursions ,allocations array types ,structures and union).	Differentiate	K4
ES-CS201.CO5	Assemble the knowledge of different programming tools and problem solving techniques in complex program.	Assemble	K6

Course Name: English (HM-HU201) Year of Study: 2025-26;

Course Title: English	Code: HM-HU201
Type of Course: Theory	Course Designation: Compulsory
Semester: 2 nd	Contact Hours: 2L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
HM-HU201.CO1	Recognize vocabulary building techniques, classify the word origins. Memorize prefixes, suffixes, antonyms, synonyms, acronyms.	Recognize	K2
HM-HU201.CO2	Apply correct sentence structure implementing correct syntax and punctuation. To organize ideas with precision.	Apply	K3
HM-HU201.CO3	Judge the common errors in writing through in-depth knowledge of grammar and practice to enhance linguistic efficacy.	Judge	K5
HM-HU201.CO4	Select requisite data to demonstrate professional writing.	Demonstrate	K3
HM-HU201.CO5	Develop overall language competency to cater to the linguistic requisites of the current industry trends.	Develop	K6

Course Name Chemistry-I Laboratory (BS-CH291) Year of Study: 2025-26;

Course Title: Chemistry-I Laboratory	Code: BS-CH291
Type of Course: Practical	Course Designation: Compulsory
Semester: 2 nd	Contact Hours: 3P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
BS-CH291.CO1	Perform conductometric, potentiometric, and pH-metric titrations to determine the strength of acid and base solutions.	Apply	K3
BS-CH291.CO2	Analyze the composition of water samples by determining dissolved oxygen, chloride ions, and hardness using appropriate analytical techniques.	Analyze	K4
BS-CH291.CO3	Evaluate physicochemical properties such as surface tension, viscosity, and conductance of various substances and solutions.	Evaluate	K5
BS-CH291.CO4	Carry out experiments to determine kinetic parameters like reaction rate constants and understand reaction mechanisms.	Apply	K3
BS-CH291.CO5	Determine partition coefficient of a compound and perform synthesis-based and qualitative analysis experiments, such as polymer synthesis and salt analysis.	Determine	K5

Course Name: Programming for Problem Solving (ES-CS291) Year of Study: 2025-26;

Course Title: Programming for Problem Solving	Code: ES-CS291
Type of Course: Practical	Course Designation: Compulsory
Semester: 2 nd	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ES-CS291.CO1	Choose appropriate data type for implementing programs in C language.	Choose	K2
ES-CS291.CO2	Write code to perform various mathematical calculations.	Write	K6
ES-CS291.CO3	Analyze modular program involving input output operations, decision making and looping constructs.	Analyze	K4
ES-CS291.CO4	Implement Arrays and functions and recursion. Apply pointers with arrays ,structures and functions.	Implement	K3
ES-CS291.CO5	Select tools for effective handling of files.	Evaluate	K5

Course Name: Engineering Graphics & Design (ES-ME291) Year of Study: 2025-26;

Course Title:Engineering Graphics & Design	Code: ES-ME291
Type of Course: Practical	Course Designation: Compulsory
Semester: 2nd	Contact Hours: 1L+4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ES-ME291.CO1	Understand the applications of hand tools and machine tools.	Understand	K2
ES-ME291.CO2	Analyze the safety measures required to be taken while using the tools.	Analyze	K4
ES-ME291.CO3	Select the appropriate tools required to manufacture an object of predetermined shape and size considering least wastage and cost.	Evaluate	K5
ES-ME291.CO4	Fabricate components with their own hands & Produce small devices of their interest by assemblingdifferent components.	Create	K6
ES-ME291.CO5	Confident on practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.	Understand	K2

Course Name: Language Laboratory (HM-HU291) Year of Study: 2025-26;

Course Title:Language Laboratory	Code: HM-HU291
Type of Course: Practical	Course Designation: Compulsory
Semester: 2nd	Contact Hours: 2P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
HM-HU291.CO1	List the linguistic/paralinguistic features (pronunciation/phonetics/voice modulation/stress/intonation/pitch and accent) of connected speech.	List	K1
HM-HU291.CO2	Understand and select data for effective professional communication.	Understand Select	K2

HM-HU291.CO3	Apply English language presentation skill in academic and professional communication.	Apply	K3
HM-HU291.CO4	Analyze ideas, viewpoints to enhance critical thinking skills and evaluate individual thought process through the productive skills (writing, speaking) of English.	Analyze & Evaluate	K4/K5
HM-HU291.CO5	Creating an integration of the four language skills. Developing grammar skills for error –free communicative competence. Apply receptive skills(reading and listening) of English in academics and in Engineering profession.	Apply Develop	K3, K6

(SEMESTER –III)

Course Name: Analog and Digital Electronics (ESC 301) Year of Study: 2025-26;

Course Title: Analog and Digital Electronics	Code: ESC 301
Type of Course: Theory	Course Designation: Compulsory
Semester: 3rd	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ESC 301.CO1	Understand the operations of different types of power amplifier as well as oscillator and multivibrator, Schmitt Trigger circuits, 555 Timer.	Understand	K2
ESC 301.CO2	Implement number system and Boolean algebra, as well as all the combinational circuits (Adder and Subtractor circuits, Encoder, Decoder, Comparator, Multiplexer, De-Multiplexer and Parity Generator.).	Illustrate	K3
ESC 301.CO3	Analyze latch and all the Sequential circuits (SR, JK, D, T and JK Master-slave Flip Flops).	Analyze	K4
ESC 301.CO4	Distinguish the basic concept of Registers (SISO, SIPO, PIPO, PISO) and Counters (Ring counter, Johnson counter, Synchronous and Asynchronous counters, Mod N Counter).	Distinguish	K4
ESC 301.CO5	Evaluate the basic concepts of logic families (TTL, ECL, MOS, CMOS) and illustrate A/D and D/A conversion techniques	Evaluate	K5

Course Name: Mathematics-III (BSC 301) Year of Study: 2025-26;

Course Title: Mathematics-III	Code: BSC 301
Type of Course: Theory	Course Designation: Compulsory
Semester: 3rd	Contact Hours: 2L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks

Writer: Course Coordinator	
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COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
BSC 301.CO1	Recall and explain the fundamental concepts of sequences, series convergence test & Taylor's series for various function.	Remember, Understand	K1, K2
BSC 301.CO2	Apply the techniques of multivariable differentiation, including partial derivatives, Jacobians & gradients to determine maxima, minima & saddle points of multi variable functions.	Apply	K3
BSC 301.CO3	Analyze multivariable integrals using Cartesian & polar coordinates & apply fundamental theorems such as Green's, Gauss's & Stoke's Theorems to solve related problems.	Analyze	K4
BSC 301.CO4	Evaluate first-order & second-order ordinary differential equations using appropriate methods including variation of parameter, D-operator & Cauchy-Euler's methods	Evaluate	K5
BSC 301.CO5	Apply concepts of graph theory and mathematical techniques to develop solutions for engineering problems.	Apply	K3

Course Name: Economics for Engineers (Humanities-II) (HSMC 301) Year of Study: 2025-26;

Course Title: Economics for Engineers (Humanities-II)	Code: HSMC 301
Type of Course: Theory	Course Designation: Compulsory
Semester: 3 rd	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
HSMC 301.CO1	Understand major principles of economic analysis for decision making among alternative courses of action in engineering.	Understand	K2
HSMC 301.CO2	Apply economic principles to prices and quantities in competitive supply and demand for goods and for money	Apply	K3
HSMC 301.CO3	Describe various cost concepts and maintenance of break even scenario for a business	Remember	K1
HSMC 301.CO4	Evaluate the overall functions of Demand, Supply, Price, Income of the firms.	Create	K5
HSMC 301.CO5	Analyze the impact of LPG on the Indian economy and solve economic problems using analytical techniques	Analyze	K4

Course Name: PCC-CS 301 (Data Structure & Algorithm) Year of Study: 2025 – 26;

Course Title: Data Structure & Algorithms	Code: PCC-CS 301
Type of Course: Theory	Course Designation: Compulsory
Semester: 3rd	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCCCS301.CO1	Define and explain basic data structures and algorithm analysis techniques	Define	K1
PCCCS301.CO2	Implement and analyze searching and sorting algorithms in terms of time and space complexity	Implement, Analyze	K3,k4
PCCCS301.CO3	Apply stack and queue data structures in solving expression-related problems	Apply	K3
PCCCS301.CO4	Analyze operations on different types of linked lists	Analyze	k4
PCCCS301.CO5	Design trees, graphs, and hashing techniques with their associated algorithms.	Design	K6

Course Name: PCC- CS 302 (Computer Organization) Year of Study: 2025–26;

Course Title: Computer Organization	Code: PCC-CS302
Type of Course: Theory	Course Designation: Compulsory
Semester: 3rd	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS302.CO1	Understand basics of Computer Organization, concepts of computers and the Von Neumann architecture as sequences and operation of computers.	Understand	K2
PCC-CS302.CO2	Design arithmetic and logical operations with integer Binary numbers, representation of signed and unsigned numbers and floating-point operands.	Design	K6
PCC-CS302.CO3	To describe the function of the instruction execution cycle, instruction formats, addressing modes, instruction set.	Describe	K1
PCC-CS302.CO4	Distinguish the organization of various part of a system memory hierarchy.	Distinguish	K4
PCC-CS302.CO5	Explain computer architectures and I/O communication with standard interfaces.	Explain	K2

Course Name: Analog and Digital Electronics (ESC 391) **Year of Study:** 2025-26;

Course Title: Analog and Digital Electronics	Code: ESC 391
Type of Course: Practical	Course Designation: Compulsory
Semester: 3 rd	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ESC 391.CO1	Understand of the fundamental concepts and techniques used in digital electronics.	Understand	K2
ESC 391.CO2	Understand and examine the structure of various number systems and its application in digital design.	Understand	K2
ESC 391.CO3	Apply the basic requirements for a design application and propose a cost effective solution of various combinational circuits.	Apply	K3
ESC 391.CO4	Analyze basic requirements for a design application and propose a cost effective solution of various sequential circuits.	Analyze	K4
ESC 391.CO5	Design and verify analog circuits and troubleshoot digital circuit hazards.	Design	K6

Course Name: Data Structure & Algorithm Lab (PCC-CS391) **Year of Study:** 2025-26;

Course Title: Data Structure & Algorithm Lab	Code: PCC-CS391
Type of Course: Practical	Course Designation: Compulsory
Semester: 3 rd	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCCCS391.CO1	Implement linear data structures like arrays, stacks, queues, and circular queues	Implement	K3
PCCCS391.CO2	Develop and perform operations on linked lists, including inversion and using them for stack and queue implementation	Develop, Perform	K4
PCCCS391.CO3	Evaluate polynomial addition and multiplication using appropriate data structures	Evaluate	K5
PCCCS391.CO4	Construct recursive and non-recursive tree traversals and perform AVL tree operations	Construct	K6
PCCCS391.CO5	Apply threaded tree traversal, hashing, and sorting/searching	Apply	K3

	algorithms in data processing		
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Course Name: Computer Organization Lab (PCC-CS392) Year of Study: 2025-26;

Course Title: Computer Organization Lab	Code: PCC-CS392
Type of Course: Practical	Course Designation: Compulsory
Semester: 3rd	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS392.CO1	Examine and verify the functionality of basic combinational circuits such as multiplexers, decoders, encoders, and comparators.	Examine	K4
PCC-CS392.CO2	Design and implement arithmetic circuits such as adders, subtractors, and BCD adders.	Design	K6
PCC-CS392.CO3	Explain the concept of carry-look-ahead logic in designing high-speed adders.	Explain	K2
PCC-CS392.CO4	Implement Arithmetic and Logic Units (ALU) using multiplexer-based circuits for single-bit and multi-bit operations.	Implement	K3
PCC-CS392.CO5	Apply RAM operations and hardware description methods for computer organization.	Evaluate	K5

Course Name: IT Workshop (PCC-CS393) Year of Study: 2025-26;

Course Title:IT Workshop	Code: PCC-CS393
Type of Course: Practical	Course Designation: Compulsory
Semester: 3rd	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS393.CO1	Understand the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.	Understand	K2
PCC-CS393.CO2	Develop the concept of Conditionals iteration (Loops, if – else statement) and Conditional Control (Break, Continue statement) in Python Programming to deal with real world simulation.	Develop	K6
PCC-CS393.CO3	Discover the strategy to deal with “String Manipulation” “Strategy formation” and “Method Handling”.	Discover	K4
PCC-CS393.CO4	Differentiate the different data-structure (List, Tuple, and Dictionary) for complete automation and bulk data handling.	Differentiate	K5
PCC-CS393.CO5	Apply modular programming with functions, file handling, exception handling, and library packages for robust programs	Interpret	K2

(SEMESTER –IV)

Course Name: Discrete Mathematics (PCC-CS401) Year of Study: 2025-26;

Course Title: Discrete Mathematics	Code: PCC-CS401
Type of Course: Theory	Course Designation: Compulsory
Semester: 4 th	Contact Hours: 3L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Course Coordinator :	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	KnowledgeLevel
PCC-CS401.CO1	Define fundamental mathematical concepts such as sets, relations, functions, and integers.	Define	K1
PCC-CS401.CO2	Explain the concept of finite set, infinite set, countable and uncountable set.	Explain	K2
PCC-CS401.CO3	Apply inclusion-exclusion and Pigeon-hole principle to a real-life problem.	Apply	K3
PCC-CS401.CO4	Determine conjunctive normal form and disjunctive normal form of a logical problem.	Determine	K5
PCC-CS401.CO5	Analyze group homomorphism, integral domain and field .	Analyze	K4

Course Name: Computer Architecture (PCC-CS402) Year of Study: 2025-26;

Course Title: Computer Architecture	Code: PCC-CS402
Type of Course: Theory	Course Designation: Compulsory
Semester: 4 th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Course Coordinator :	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS402.CO1	Memorize the fundamentals of computer architecture, performance metrics, and quantitative design techniques.	Remember	K1
PCC-CS402.CO2	Discuss the principles of pipelining including instruction and arithmetic pipelines, hazards, and exception handling.	Understand	K2
PCC-CS402.CO3	Apply techniques to handle pipeline hazards and optimize pipeline performance through hardware and compiler-level improvements.	Apply	K3
PCC-CS402.CO4	Describe hierarchical memory technologies including cache and virtual memory.	Describe	K2
PCC-CS402.CO5	Analyze instruction-level parallelism techniques such as superscalar, super pipelined, and VLIW architectures and Evaluate non-von Neumann architectures such as dataflow, reduction, and systolic systems in terms of their processing paradigms	Analyze, Evaluate	K4,k5

Course Name: Formal Language & Automata Theory (PCC-CS403) Year of Study: 2025-26;

Course Title: Formal Language & Automata Theory	Code: PCC-CS403
Type of Course: Theory	Course Designation: Compulsory
Semester: 4th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Course Coordinator :	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC CS403.CO1	Understand the concept of abstract machines and their power to recognize the languages.	Understand	K2
PCC-CS403.CO2	Demonstrate finites machines for modeling and solving computing problems.	Apply	K3
PCC-CS403.CO3	Analyze Finite automata, Regular expression and regular grammars to describe regular languages.	Analyze	K4
PCC-CS403.CO4	Develop context free grammars to generate strings from a context free language.	Create	K6
PCC-CS403.CO5	Describe equivalence of languages accepted by Push Down Automata and languages generated by context free grammars and Distinguish an understanding of decidability and undecidability.	Understand, Analyse	K2,K4

Course Name: Design and Analysis of Algorithms (PCC-CS404) Year of Study: 2025-26;

Course Title: Design and Analysis of Algorithms	Code: PCC-CS404
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Type of Course: Theory	Course Designation: Compulsory
Semester: 4th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Course Coordinator :	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS404.CO1	Analyze running time of Algorithms using asymptotic methods.	Analyze	K4
PCC-CS404.CO2	Illustrate the techniques of Greedy paradigm, Branch and Bound, Backtracking etc and compare and contrast them.	Illustrate	K2
PCC-CS404.CO3	Develop the algorithm techniques (example Divide & Conquer, Dynamic Programming etc) to solve different mathematical models.	Develop	K6
PCC-CS404.CO4	Apply optimization problems using backtracking and branch & Bound techniques.	Apply	K3
PCC-CS404.CO5	Understand the concepts of NP Completeness, Randomized and Approximation Algorithms.	Understand	K2

Course Name: Biology (BSC 401) Year of Study: 2025-26;

Course Title: Biology	Code: BSC 401
Type of Course: Theory	Course Designation: Compulsory
Semester: 4th	Contact Hours: 2L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Course Coordinator :	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
BSC 401.CO1	Describe with examples the biological observations lead to major discoveries	Describe	K1
BSC 401.CO2	Explain the classification of kingdom and building blocks of life, classification at cellular, energy and excretory level, habitat, study of model organisms, explain techniques of biophysics to study biological phenomena, cancer diagnosis and treatment.	Explain	K2
BSC 401.CO3	Identify DNA as genetic material in the molecular basis of information transfer	Identify	K3
BSC 401.CO4	Analyze biological processes at the reductionistic level.	Analyze	K4
BSC 401.CO5	Apply thermodynamic principles to biological systems and Identify microorganism	Apply, Identify	K3

Course Name: Environmental Sciences (MC-401) Year of Study: 2025-26;

Course Title: Environmental Sciences	Code: MC-401
Type of Course: Theory	Course Designation: Compulsory

Semester: 4th	Contact Hours: 1L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Course Coordinator :	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
BSC 401.CO1	Resolve different open-ended problems related to air pollution acquiring the detailed knowledge about source, effect and mechanism of the pollution.	Resolve	K3
BSC 401CO2	Conceive the basic of the need of natural resource management, environmental protection and population control.	Conceive	K2
BSC 401.CO3	Acquire skills for scientific problem-solving related to air, water, noise & land pollution.	Acquire	K1
BSC 401.CO4	Determine the issues related to noise pollution after studying the existing situation in detail.	Determine	K5
BSC 401.CO5	Develop awareness about the geographical feature of the country considering biodiversity and the variety of ecological systems present in the nature.	Develop	K6

Course Name: Computer Architecture Lab (PCC-CS492) Year of Study: 2025-26;

Course Title: Computer Architecture Lab	Code: PCC-CS492
Type of Course: Practical	Course Designation: Compulsory
Semester: 4th	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Course Coordinator :	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS492.CO1	Define the basic concepts and syntax of HDL used for digital system modeling.	Define	K1
PCC-CS492.CO2	Construct digital logic circuits using HDL for basic arithmetic operations like addition and subtraction.	Construct	K6
PCC-CS492.CO3	Analyze the working of 8-bit register and memory units designed using HDL.	Analyze	K4
PCC-CS492.CO4	Describe the architecture of a simple 8-bit ALU and CPU using HDL.	Describe	K2
PCC-CS492.CO5	Evaluate different methods of interfacing between memory and CPU using HDL.	Evaluate	K5

Course Name: Design & Analysis Algorithm Lab (PCC-CS494) Year of Study: 2025-26;

Course Title: Design & Analysis Algorithm Lab	Code: PCC-CS494
Type of Course: Practical	Course Designation: Compulsory
Semester: 4th	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Course Coordinator :	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS494.CO1	Analyse different types of applications of Divide & Conquer techniques	Analyze	K4
PCC-CS494.CO2	Understanding to implement Dynamic Programming techniques	Understand	K2
PCC-CS494.CO3	Examine to implement knapsack, Job sequencing with deadlines, Prim's and Kruskal's algorithms by using greedy method	Examine	K4
PCC-CS494.CO4	Discuss the implementation of the N-Queen and Graph Coloring Problem by using Backtracking	Discuss	K6
PCC-CS494.CO5	Apply 15 Puzzle problem by using Branch & Bound and Explain the way of implementation of BFS and DFS by using Graph Traversal Algorithms	Apply Explain	K3, K2

(SEMESTER –V)

Course Name: Introduction to Industrial Management (Humanities III) (HSMC-501) Year of Study: 2025-26;

Course Title: Introduction to Industrial Management (Humanities III)	Code: HSMC-501
Type of Course: Theory	Course Designation: Compulsory
Semester: 5th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
HSMC-501.CO1	Remember the principles of accounting and identify the various systems utilized in business settings.	Remember	K1
HSMC-501.CO2	Discuss the creation of the right accounting tool needed for practical issues.	Discuss	K2
HSMC-501.CO3	Explain the application of economic principles.	Explain	K2

HSMC-501.CO4	Examine and model a sequential accounting tool for a process or system that is suitable for the necessary level of accuracy.	Examine and model	K3
HSMC-501.CO5	Create a step-by-step economic strategy that complies with the necessary requirements and explain why a particular accounting method is appropriate for achieving the specified goal.	Create	K6

Course Name: Artificial Intelligence (PEC-IT501B) Year of Study: 2025-26;

Course Title: Artificial Intelligence	Code: PEC-IT501B
Type of Course: Theory	Course Designation: Elective
Semester: 5th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PEC-IT501B.CO1	Define fundamental concepts of AI, including intelligent agents, search algorithms, and knowledge representation.	Remember	K1
PEC-IT501B.CO2	Explain and interpret various informed and uninformed search strategies used in AI applications	Understand	K2
PEC-IT501B.CO3	Apply AI techniques to solve complex engineering problems, considering ethical, societal, and environmental impacts.	Apply	K3
PEC-IT501B.CO4	Analyze and differentiate between different AI methods and paradigms for given problem scenarios such as Understand and Apply Predicate Logic	Analyze	K4
PEC-IT501B.CO5	Evaluate the effectiveness of machine learning algorithms, including supervised and unsupervised learning techniques, for real-world applications; understand knowledge representation issues and concept learning	Evaluate, Explain	K5,K2

Course Name: Constitution of India (MC- CS501) Year of Study: 2025-26;

Course Title: Constitution of India	Code: MC- CS501
Type of Course: Theory	Course Designation: Elective
Semester: 5th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
MC- CS501.CO1	Describe the meaning and historical evolution of the Constitution of India, including its sources and salient features such as Citizenship, Preamble, Fundamental Rights and Duties, and Directive Principles of State Policy.	Describe	K2

MC- CS501.CO2	Explain the federal structure and working of the Union Government, including the powers and roles of the President, Prime Minister, Council of Ministers, and the structure of the Parliament and Central Secretariat.	Explain	K2
MC- CS501.CO3	Illustrate the structure and functions of State Government administration, focusing on the role of the Governor, Chief Minister, and State Secretariat.	Illustrate	K3
MC- CS501.CO4	Demonstrate understanding of local self-government by evaluating the roles of elected and appointed officials at District, Block, and Village levels and the significance of grassroot democracy.	Demonstrate	K3
MC- CS501.CO5	Evaluate the functioning of the Election Commission of India and State Election Commissions in promoting electoral integrity and democratic values, and analyze the roles of constitutional bodies and welfare institutions in protecting the interests of SC/ST/OBC and women within the framework of social justice and equity in governance.	Evaluate	K5

Course Name: ESC501 (Software Engineering) Year of Study: 2025 – 26;

Course Title: Software Engineering	Code:ESC501
Type Of Course: Theory	Course Designation: Compulsory
Semester: 5th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ESC501.CO1	Apply various process model approaches and techniques in each phase of SDLC to solve real world problem.	Applying	K3
ESC501.CO2	Analyze the various Software Engineering principles to understand the system and Requirement Engineering process.	Analyzing	K4
ESC501.CO3	Evaluate the various project models based on the analysis and design Engineering and Determine product quality through testing techniques—Unit, Integration, and System testing.	Evaluating	K5
ESC501.CO4	Demonstrate the principles, processes and main knowledge areasfor Software Project Management.	Demonstrate	K2
ESC501.CO5	Design various types of UML diagram (like Activity, Class, Sequence, Object) with proper knowledge when use a particular type of tools based on the software product requirements.	Design	K6

Course Name: PCC-CS501 (Compiler Design) Year of Study: 2025-26;

Course Title: Compiler Design	Code:PCC-CS501
Type of Course: Theory	Course Designation: Compulsory
Semester: 5th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS501.CO1	Explain the phases in compilation process (lexical analysis, syntax analysis, semantic analysis, intermediate code generation, code optimization and code generation) and model a lexical analyzer.	Explain	K5
PCC-CS501.CO2	Students will be able to model language syntax using Context Free Grammar and construct Top-Down Parsers.	Construct	K3
PCC-CS501.CO3	Compare different types of parsers (Bottom-up and Top-down) and construct parser for a given grammar.	Compare	K5
PCC-CS501.CO4	Demonstrate the applications of SDT and different types of intermediate-code generation.	Demonstrate	K2
PCC-CS501.CO5	Identify the storage organization used to support the run-time environment of a program and effectively generate machine code, while analyzing code optimization and code generation techniques in the compilation process.	Identify	K1

Course Name: PCC-CS502 (: Operating Systems) Year of Study: 2025– 26;

Course Title: Operating Systems	Code:PCC-CS502
Type Of Course: Theory	Course Designation: Compulsory
Semester: 5 th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS502.CO1	Demonstrate the concepts of Operating System Services, System calls, structure and types and basic principles used in the design of modern operating system and process	Demonstrate	K3
PCC-CS502.CO2	Discuss details of process management and threads for multiprogramming and multi-threading	Discuss	K2
PCC-CS502.CO3	Develop different algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response	Develop	K6
PCC-CS502.CO4	Evaluate different algorithmic solutions to process synchronization problems for Inter-Process communication	Evaluate	K5
PCC-CS502.CO5	Analyze the necessary conditions and mechanisms for deadlock detection, avoidance, and prevention, and explain various techniques of memory management, including virtual memory, I/O hardware, and file and disk management systems.	Analyze	K4

Course Name: PCC-CS503 (Object Oriented Programming) Year of Study: 2025– 26;

Course Title: Object Oriented Programming	Code: PCC-CS503
Type of Course: Theory	Course Designation: Compulsory
Semester: 5th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS503.CO1	Demonstrate proficiency in crafting simple yet effective programs that incorporate branching and looping structures, showcasing the ability to apply foundational programming techniques.	Demonstrate	K3
PCC-CS503.CO2	Describe and implement classes with appropriate data members and methods for given scenarios, articulating the relationships among components to create cohesive object-oriented solutions.	Describe	K2
PCC-CS503.CO3	Analyze the principles of inheritance, interfaces, and exception handling to devise innovative solutions for real-world challenges, fostering adaptable programming skills.	Analyze	K4
PCC-CS503.CO4	Develop advanced multithreading programs, utilize packages effectively, and integrate wrapper classes to build robust and efficient applications.	Develop	K6
PCC-CS503.CO5	Apply common object-oriented design patterns to address general programming problems with an emphasis on reusable and maintainable code structures, and develop intuitive GUI applications using applet classes, Swing components, and event-handling mechanisms to deliver an interactive user experience.	Apply	K3

Course Name: Software Engineering Lab (ESC591) Year of Study: 2025-26;

Course Title: Software Engineering Lab	Code:ESC591
Type of Course: Practical	Course Designation: Compulsory
Semester: 5th	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
ESC591.CO1	Understand a variety of approaches and perspectives of system development.	Understand	K2
ESC591.CO2	Identify the requirements which are relevant to the design of a system.	Identify	K2
ESC591.CO3	Design Software model with a set of objects and their relationships using structural modeling.	Design	K6

ESC591.CO4	Develop use case diagrams, activity diagrams, class diagrams, sequence diagrams, object diagrams and collaboration diagram.	Develop	K6
ESC591.CO5	Evaluate activities using behavioral modeling and analyze components through architectural modeling.	Evaluate	K5

Course Name: Operating System Lab (PCC-CS592) Year of Study: 2025-26;

Course Title: Operating System Lab	Code:PCC-CS592
Type of Course: Practical	Course Designation: Compulsory
Semester: 5th	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS592.CO1	Understand different Unix/Linux commands and shell programming	Understand	K2
PCC-CS592.CO2	Demonstrate the creation of processes and POSIX threads.	Demonstrate	K3
PCC-CS592.CO3	Develop the problems of process scheduling and process synchronization (Signal and Semaphore)	Develop	K6
PCC-CS592.CO4	Evaluate the deadlock avoidance and detection algorithms.	Evaluate	K5
PCC-CS592.CO5	Analyze different memory allocation and file accessing techniques, and interpret inter-process communication through system calls.	Analyze	K4

Course Name: Object Oriented Programming Lab (PCC-CS593) Year of Study: 2025-26;

Course Title: Object Oriented Programming Lab	Code:PCC-CS593
Type of Course: Practical	Course Designation: Compulsory
Semester: 5th	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS593.CO1	Identify appropriate programming constructs and object-oriented principles to implement solutions for real-world scenarios, demonstrating a strong grasp of problem-solving skills.	Identify	K2
PCC-CS593.CO2	Understand the fundamentals of object-oriented programming by exploring the key concepts of classes, objects, Constructors, Method Overloading, Method Overriding, Inheritance, and polymorphism through hands-on practice.	Understand	K2
PCC-CS593.CO3	Develop and debug Programs using String Manipulation, and Arrays.	Develop	K3

PCC-CS593.CO4	Develop and debug Programs using Wrapper Class and Vector.	Develop	K3
PCC-CS593.CO5	Analyze and utilize an integrated development environment by creating and accessing packages, implementing multithreaded programming, and applying exception handling, while developing dynamic and user-friendly GUI applications using applets, Swing components, and event handling.	Analyze	K4

(SEMESTER –VI)

Course Name: Database Management Systems (PCC- CS601) Year of Study: 2025-26;

Course Title: Database Management Systems	Code: PCC- CS601
Type of Course: Theory	Course Designation: Compulsory
Semester: 6th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC- CS601.CO1	Explain the architecture of database systems, data abstraction, data independence, data models, and data manipulation operations.	Explain	K2
PCC- CS601.CO2	Apply relational query languages (Relational Algebra, Relational Calculus, SQL) and analyze relational database design using normalization, functional dependencies, and dependency preservation.	Apply / Analyze	K3 / K4
PCC- CS601.CO3	Demonstrate storage and indexing strategies such as B-trees and hashing for efficient data retrieval.	Demonstrate	K3
PCC- CS601.CO4	Analyze transaction processing concepts including concurrency control, recovery techniques, and ACID properties to ensure reliable database operations.	Analyze	K4
PCC- CS601.CO5	Evaluate database security mechanisms, advanced database models (object-oriented, distributed, web databases), and concepts of data warehousing and data mining.	Evaluate	K5

Course Name: Computer Networks (PCC- CS602) Year of Study: 2025-26;

Course Title: Computer Networks	Code: PCC- CS602
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Type of Course: Theory	Course Designation: Compulsory
Semester: 6th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC- CS602.CO1	Define the basic concepts of Networking types, Networking Technologies and Layered Architecture.	Define	K1
PCC- CS602.CO2	Explain the representation of data and signals in data communication.	Explain	K2
PCC- CS602.CO3	Demonstrate the physical layer and data link layer functioning and Design the individual networks.	Demonstrate/Design	K3/K6
PCC- CS602.CO4	Examine the MAC sub-layer and their operations.	Examine	K4
PCC- CS602.CO5	Identify the different types of protocols and their functions within a network.	Identify	K2

Course Name: Image Processing (Image Processing) Year of Study: 2025-26;

Course Title: Image Processing	Code: PEC-IT601D
Type of Course: Theory	Course Designation: Elective
Semester: 6th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PEC-IT601D.CO1	Understand the fundamental concepts of a digital image processing (DIP) system.	Understand	K2
PEC-IT601D.CO2	Remember different techniques employed for the enhancement of images.	Remember	K1
PEC-IT601D.CO3	Apply the Frequency domain Techniques to real life image Processing.	Apply	K3
PEC-IT601D.CO4	Analyze image segmentation and representation techniques.	Analyze	K4
PEC-IT601D.CO5	Analyze image restoration procedures and Understand the rapid advances of (DIP) in Machine vision	Analyze/ Understand	K4/K2

Course Name: Pattern Recognition (PEC-IT602D) Year of Study: 2025-26;

Course Title: Pattern Recognition	Code: PEC-IT602D
Type of Course: Theory	Course Designation: Elective
Semester: 6th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PEC-IT602D.CO1	Define the basic concepts of pattern recognition (measuring objects, features and patterns, representation, per-processing, distance and similarity measures) and analyses bayes classifiers in terms of error probabilities, discriminant functions, decision surfaces, normal density and discriminant functions, discrete features	Define	K1
PEC-IT602D.CO2	Explain the parameter estimation methods using the maximum-likelihood estimation, gaussian mixture models, expectation-maximization method and bayesian estimation and the non-parametric techniques such as k-Nearest neighbours, parzen window for density estimation.	Explain	K2
PEC-IT602D.CO3	Analyze the linear discriminant function based classifier design such as perceptron and support vector machines	Analyze	K4
PEC-IT602D.CO4	Apply the Non-metric methods for pattern classificationand formulate the dimension reduction methods such as principal component analysis, fischer's discriminant Analysis.	Apply	K3
PEC-IT602D.CO5	Explain unsupervised learning and clustering algorithms, and analyses their strengths and weakness	Explain	K2

Course Name: Numerical Methods (OEC-IT601A) Year of Study: 2025-26;

Course Title: Numerical Methods	Code: OEC-IT601A
Type of Course: Theory	Course Designation: Elective
Semester: 6th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
OEC-IT601A.CO1	Demonstrate the basic concept of error analysis in Computational schemes.	Demonstrate	K2
OEC-IT601A.CO2	Apply various interpolation methods and finite difference concepts.	Apply	K3
OEC-IT601A.CO3	Explain the concept of numerical integration and its importance.	Explain	K2
OEC-IT601A.CO4	Identify various numerical methods to solve linear and non-linear equation and its application in non-linear analysis.	Identify	K1

OEC-IT601A.CO5	Apply numerical methods to find solutions of algebraic Equations using different techniques under various conditions, and define different types of differential equations numerically.	Apply	K3
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Course Name: Research Methodology (PROJ- CS601) Year of Study: 2025-26;

Course Title: Research Methodology	Code: PROJ- CS601
Type of Course: Theory	Course Designation: Compulsory
Semester: 6th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PROJ- CS601.CO1	Define and understand the motivation and objectives of research work	Define	K1
PROJ- CS601.CO2	Explain how to define and formulate a research problem	Explain	K2
PROJ- CS601.CO3	Identify the importance of literature review in a research work	Identify	K3
PROJ- CS601.CO4	Examine the appropriate statistical methods required for a particular research design and develop the appropriate research hypothesis for a research project	Examine	K4
PROJ- CS601.CO5	Develop the skill set to correctly present a research work by following the protocols of writing a standard research report.	Develop	K6

Course Name: Database Management System Lab (PCC-CS691) Year of Study: 2025-26;

Course Title: Database Management System Lab	Code: PCC-CS691
Type of Course: Practical	Course Designation: Compulsory
Semester: 6th	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS691.CO1	Design relational schemas and create tables, constraints, and indexes using SQL.	Apply	K3
PCC-CS691.CO2	Manipulate and manage data using SQL DML and schema-alteration commands such as INSERT, UPDATE, DELETE, TRUNCATE, ALTER, and DROP	Apply	K3
PCC-CS691.CO3	Retrieve and analyze data using advanced SQL queries with WHERE conditions, aggregate functions, GROUP	Analyze	K4

	BY/HAVING, joins, and subqueries.		
PCC-CS691.CO4	Administer database objects and security by creating views, managing users, and implementing privilege control through GRANT and REVOKE	Apply	K3
PCC-CS691.CO5	Develop modular database applications by writing PL/SQL programs using cursors, exception handling, and stored procedures.	Create	K6

Course Name: Computer Networks Lab (PCC-CS692) Year of Study: 2025-26;

Course Title: Computer Networks Lab	Code: PCC-CS692
Type of Course: Practical	Course Designation: Compulsory
Semester: 6th	Contact Hours: 4P/week
Continuous Assessment: 40 Marks	Final Exam: 60 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PCC-CS692.CO1	Describe the Networking cables (CAT5, UTP), Connectors (RJ45, T-connector) and installation of Network Interface Card .	Describe	K1
PCC-CS692.CO2	Explain the working and difference of various networking devices like Hub, Bridge, Network Switch, Router and Modem.	Explain	K2
PCC-CS692.CO3	Developed a client server socket programming using TCP and UDP approach in C and Java and generate techniques Data link Layer Flow control mechanismslike Stop &Wait and Sliding Window using C.	Develop/ Generate	K3/K4
PCC-CS692.CO4	Explain how to implement Data Link Layer Error Detection Mechanism (Cyclic Redundancy Check) and error control mechanism like Selective Repeat and GoBack-N algorithm using C.	Explain	K5
PCC-CS692.CO5	Create the server setup configuration using different process like FTP, DNS, TelNet,NFS and concept of Firewall.	Create	K6

(SEMESTER –VII)

Course Name: Machine Learning (PEC-CS701E) Year of Study: 2025-26;

Course Title: Machine Learning	Code: PEC-CS701E
Type of Course: Theory	Course Designation: Elective
Semester: 7th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PEC-CS701E.CO1	Understand the Basic need of incorporating Self train ML model over Traditional Programming to identify the co-relative pattern using Statistical Approach for Classification (Discrete-data) and Regression (Continuous-data) analysis.	Understand	K2
PEC-CS701E.CO2	Differentiate the concept of Supervised ML ((DT, LR, and Logistic Regression) and Un-Supervised ML (Clustering) and different standard algorithm for optimizing real world problem for non-linearity behavior over linearity.	Differentiate	K5
PEC-CS701E.CO3	Identify the need of dimensionality Reduction techniques (LDA, PCA) to handle bias-variance trade-off to increase the model “accuracy” by reducing “variance”.	Identify	K1
PEC-CS701E.CO4	Demonstrate the concept of Feature Engineering and handling of “Time series” data by using (RNN, LSTM model).	Demonstrate	K2
PEC-CS701E.CO5	Evaluate the different approaches to select a “ML model” and Construct the concept of Bayesian Inference, Hidden Markov model, Deep-Learning framework, Reinforcement Learning to optimize situation dependent real world problem.	Evaluate, Construct	K5,K6

Course Name: Multimedia Technology (OEC-CS701B)Year of Study: 20245– 26

Course Title: Multimedia Technology	Code:OEC-CS701B
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Type of Course: Theory	Course Designation: Elective
Semester: 7th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
OEC-CS701B.CO1	Introduction and Remembering the basic concepts of Multimedia.	Remember	K1
OEC-CS701B.CO2	Classify the key components of multimedia technologies including text, graphics, voice, video and computer based animation	Classify	K4
OEC-CS701B.CO3	Demonstrate the Synchronization concept and various multimedia data formats (e.g., image, audio, and video) to understand the techniques for compressing multimedia data to optimize storage and transmission.	Demonstrate	K2
OEC-CS701B.CO4	Understanding the comparatively study of different available multimedia document Architectures to build the multimedia applications using programming languages, multimedia tools, and APIs for interactive media, and software.	Analyze	K5
OEC-CS701B.CO5	Implement and manage real-time multimedia processing, including video/audio streaming, live broadcasting, and multimedia content delivery over networks and Analyze the concept of popular Multimedia Application in various fields /platforms.	Implement	K3

Course Name: Project Management and Entrepreneurship(HSMC 701)Year of Study: 2025 – 26

Course Title: Project Management and Entrepreneurship	Code: HSMC 701
Type of Course: Theory	Course Designation: Compulsory
Semester: 7th	Contact Hours: 2L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
HSMC 701.CO1	Identify the phases of project management (Initiation, Planning, Execution, Monitoring & Controlling, and Closing).	Identify	K1
HSMC 701.CO2	Demonstrate a clear understanding of the core concepts of project management, including scope, time, cost, quality, risk, and resources.	Demonstrate	K2
HSMC 701.CO3	Apply project management methodologies (e.g., Waterfall, Agile, Scrum) to develop detailed project plans, timelines, and budgets.	Apply	K3
HSMC 701.CO4	Analyze strategic decisions that entrepreneurs need to make the ability to engage in strategic planning and evaluate team performance by aligning skills, roles, and responsibilities within project constraints.	Analyze, evaluate	K4,k5

HSMC 701.CO5	Develop clear communication strategies to keep all stakeholders informed and aligned with project goals. .	Develop	K6
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Course Name: Neural Network and Deep Learning (PEC-CS 702A)Year of Study: 2025– 26

Course Title: Neural Network and Deep learning	Code: PEC-CS 702A
Type of Course: Theory	Course Designation: Compulsory
Semester: 7th	Contact Hours: 2L+1T/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PEC-CS702A.CO1	Understand the fundamental concepts of neural networks, including perceptrons, activation functions, and learning paradigms.	Understand	K2
PEC-CS702A.CO2	Analyze and implement various types of neural networks such as feedforward, convolutional, and recurrent neural networks	Analyze	K4
PEC-CS702A.CO3	Apply deep learning techniques using frameworks such as TensorFlow or PyTorch to solve real-world problems.	Apply	K3
PEC-CS702A.CO4	Evaluate and optimize the performance of neural network models using regularization, hyperparameter tuning, and model evaluation metrics.	Evaluate	K5
PEC-CS702A.CO5	Demonstrate knowledge of advanced topics like transfer learning, generative models (GANs), and reinforcement learning and Design deep learning solutions for applications in image processing, natural language processing, and time series analysis	Demonstrate, Design	K2,K6

Course Name: Project Project-II (PROJ-CS781) Year of Study: 2025 – 26

Course Title: Project-II	Code: PROJ-CS781
Type of Course: Sessional	Course Designation: Compulsory
Semester: 7th	Contact Hours: 12P/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PROJ-CS781.CO1	Identify the Problem & Problem Domain in the broad field of Computer Science & Engineering.	Identify	K3
PROJ-CS781.CO2	Understand the Research Methodologies and Field Study	Understand	K2
PROJ-CS781.CO3	Understand the Tools and Techniques used	Understand	K2

PROJ-CS781.CO4	Identify of the Relevant Resources and Data Set	Identify	K3
PROJ-CS781.CO5	Prepare of s/w and h/w requirement analysis and Develop goal in line with flow of work	Prepare, Develop	K6

(SEMESTER –VIII)

Course Name: Cryptography and Network Security (PEC-CS801B) Year of Study: 2025-26;

Course Title: Cryptography and Network Security	Code: PEC-CS801B
Type of Course: Theory	Course Designation: Elective
Semester: 8th	Contact Hours: 3L/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PEC-CS801B.CO1	Classify the Symmetric encryption techniques and illustrate various private key cryptographic techniques.	Understand	K2
PEC-CS801B.CO2	Make use of modular arithmetic's and public key cryptosystem to protect the data over network.	Apply	K3
PEC-CS801B.CO3	Evaluate the authentication and hash algorithms.	Evaluate	K4
PEC-CS801B.CO4	Identify different protocols for effective key management, distribution and authentication in public key infrastructure.	Identify	K3
PEC-CS801B.CO5	Explain various security practices and system security standards.	Explain	K2

Course Name: E-Commerce & ERP (OEC-CS802A) Year of Study: 2025-26;

Course Title: E-Commerce & ERP	Code: OEC-CS802A
Type of Course: Theory	Course Designation: Elective
Semester: 8th	Contact Hours: 3L/week

Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
OEC-CS802A.CO1	Explain the fundamental concepts, advantages, disadvantages, threats, rules, and regulations of E-Commerce, including cyber laws.	Explain	K2
OEC-CS802A.CO2	Apply different technologies for E-Commerce including internet, intranet, extranet, mobile computing, and web security.	Apply	K3
OEC-CS802A.CO3	Analyze and differentiate business models of E-Commerce (B2B, B2C, C2B, C2C, E-Governance) and strategies for development.	Analyze	K4
OEC-CS802A.CO4	Evaluate supply chain management, e-payment mechanisms, content management, call centers, and marketing strategies in E-Commerce.	Evaluate	K5
OEC-CS802A.CO5	Design and appraise ERP systems, business process re-engineering, ERP modules, and integration of ERP with E-Commerce.	Design	K6

Course Name: Cyber law and Ethics (OEC-CS801B) Year of Study: 2025-26;

Course Title: Cyber law and Ethics	Code: OEC-CS801B
Type of Course: Theory	Course Designation: Optional
Semester: 8th	Contact Hours: 3P/week
Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
OEC-CS801B.CO1	Define and describe fundamental concepts of cybercrime, such as forgery, hacking, software piracy, and network intrusion.	Define / Describe	K1
OEC-CS801B.CO2	Classify categories of cybercrimes and explain how criminals plan passive and active attacks, including cyber stalking.	Classify / Explain	K2
OEC-CS801B.CO3	Illustrate security challenges related to mobile and wireless devices, and demonstrate cryptographic techniques to mitigate risks.	Illustrate / Demonstrate	K3
OEC-CS801B.CO4	Explain phishing techniques and analyze identity theft mechanisms and online identity protection strategies.	Explain / Analyze	K2 / K4
OEC-CS801B.CO5	Evaluate legal and ethical frameworks including Indian IT Act, public key certificates, and the role of cyber security law in digital governance.	Evaluate	K5

Course Name: Project-III (PROJ-CS881) Year of Study: 2025-26;

Course Title: Project-III	Code: PROJ-CS881
Type of Course: Sessional	Course Designation: Compulsory
Semester: 8th	Contact Hours: 12P/week

Continuous Assessment: 25 Marks	Final Exam: 70 Marks
Writer: Course Coordinator	Approved by HoD (convenor of DAB)

COURSE OUTCOMES (COs)

On completion of the course students will be able to

Course Outcomes	Details	Action Verb	Knowledge Level
PROJ-CS881.CO1	Understand the underlying technical concepts and theory.	Understand	K2
PROJ-CS881.CO2	Practice hands on experience to build the basic models and Integrate all the parts and deployment of the project	Apply	K3
PROJ-CS881.CO3	Develop mathematical generalize of the solution	Create	K6
PROJ-CS881.CO4	Prepare a Dissertation and Presentation in the standard format for being evaluated by the Department.	Create	K6
PROJ-CS881.CO5	Prepare a paper for Conference presentation/Publication in Journals, if possible.	Create	K6