



Regent Education & Research Foundation

Group of institutions

Computer Science & Engineering Department

SEMESTER – II

Programming for Problem Solving

Code: ES-CS201

Course Outcomes:

On completion of the course students will be able to

- ES-CS201.1 Formulate simple algorithms for arithmetic and logical problems.
- ES-CS201.2 Translate the algorithms to programs (in C language).
- ES-CS201.3 Test and execute the programs and correct syntax and logical errors.
- ES-CS201.4 Implement conditional branching, iteration and recursion.
- ES-CS201.5 To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
- ES-CS201.6 Use arrays, pointers and structures to formulate algorithms and programs.
- ES-CS201.7 Apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
- ES-CS201.8 Apply programming to solve simple numerical method problems, namely root finding of function, differentiation of function and simple integration.

Programming for Problem Solving Lab

Code: ES-CS291

Course Outcomes:

On completion of the course students will be able to

- ES-CS291.1 Formulate the algorithms for simple problems
- ES-CS291.2 Translate given algorithms to a working and correct program
- ES-CS291.3 Correct syntax errors as reported by the compilers
- ES-CS291.4 Identify and correct logical errors encountered at run time
- ES-CS291.5 Write iterative as well as recursive programs
- ES-CS291.6 Represent data in arrays, strings and structures and manipulate them through a program
- ES-CS291.7 Declare pointers of different types and use them in defining self-referential structures.
- ES-CS291.8 Create, read and write to and from simple text files.

SEMESTER – III

Analog & Digital Electronics

Code: ESC-301

Course Outcomes:

On completion of the course students will be able to

ESC-301.1 Realize the basic operations of different analog components.

ESC-301.2 Realize basic gate operations and laws Boolean algebra.

ESC-301.3 Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.

Data Structure & Algorithm

Code: PCC-CS301

Course Outcomes:

On completion of the course students will be able to

PCC-CS301.1 Differentiate how the choices of data structure & algorithm methods impact the performance of program.

PCC-CS301.2 Solve problems based upon different data structure & also write programs.

PCC-CS301.3 Identify appropriate data structure & algorithmic methods in solving problem.

PCC-CS301.4 Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing

PCC-CS301.5 Compare and contrast the benefits of dynamic and static data structures implementations.

Computer Organization

Code: PCC-CS302

Course Outcomes:

On completion of the course students will be able to

PCC-CS302.1 Understand basic structure of digital computer, stored program concept and different arithmetic and control unit operations.

PCC-CS302.2 Understand basic structure of different combinational circuits, multiplexer, decoder, encoder etc.

PCC-CS302.3 Perform different operations with sequential circuits. PCC-CS302.4 Understand memory and I/O operations.

Mathematics-III (Differential Calculus)

Code: BSC-301

Course Outcomes:

On completion of the course students will be able to

BSC-301.1 Express a logic sentence in terms of predicates, quantifiers, and logical connectives.

BSC-301.2 Apply the rules of inference and methods of proof including direct and indirect proof forms, proof by contradiction, and mathematical induction.

BSC-301.3 Use tree and graph algorithms to solve problems

BSC-301.4 Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra.

Economics for Engineers (Humanities-II)

Code: HSMC-301

Course Outcome:

On completion of the course students will be able to

HSMC-301.1 Make different economic decisions and estimate engineering costs by applying different cost estimation models.

HSMC-301.2 Create cash flow diagrams for different situations and use different interest formulae to solve associated problems.

HSMC-301.3 Take decisions regarding different engineering projects by using various criteria like rate of return analysis, present worth analysis, cost-benefit analysis etc.

HSMC-301.4 Incorporate the effect of uncertainty in economic analysis by using various concepts like expected value, estimates and simulation.

HSMC-301.5 Understand the concepts of depreciation and replacement analysis and solve associated problems.

HSMC-301.6 Understand the process of inflation and use different price indices to adjust for its effect.

HSMC-301.7 Apply the various concepts of Accounting like balance sheet and ratio analysis.

HSMC-301.8 Understand the scope of Finance and the role of financial planning and management.

Analog & Digital Electronics Lab

Code: ESC-391

Course Outcomes:

1 ESC-301.1

2 ESC-301.2

3 ESC-301.3

Data Structure & Algorithm Lab

Code: PCC-CS391

Course Outcomes:

- 1 PCC-CS301.1
- 2 PCC-CS301.2
- 3 PCC-CS301.3
- 4 PCC-CS301.4
- 5 PCC-CS301.5

Computer Organization Lab

Code: PCC-CS392

Course Outcomes:

- 1 PCC-CS302.1
- 2 PCC-CS302.2
- 3 PCC-CS302.3
- 4 PCC-CS302.4

IT Workshop (Sci Lab/MATLAB/Python/R)

Code: PCC-CS393

Course Outcomes:

- 1 To master an understanding of scripting & the contributions of scripting languages
- 2 Design real life problems and think creatively about solutions
- 3 Apply a solution in a program using R/Matlab/Python.
- 4 To be exposed to advanced applications of mathematics, engineering and natural sciences to program real life problems.

SEMESTER – IV

Discrete Mathematics

Code: PCC-CS401

Course Outcomes:

On completion of the course students will be able to

PCC-CS401.1 Express a logic sentence in terms of predicates, quantifiers, and logical connectives

PCC-CS401.2 Derive the solution for a given problem using deductive logic and prove the solution based on logical inference

PCC-CS401.3 Classify its algebraic structure for a given a mathematical problem,

PCC-CS401.4 Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra

PCC-CS401.5 Develop the given problem as graph networks and solve with techniques of graph theory.

Computer Architecture

Code: PCC-CS402

Course Outcomes:

On completion of the course students will be able to

PCC-CS402.1 Learn pipelining concepts with a prior knowledge of stored program methods

PCC-CS402.2 Learn about memory hierarchy and mapping techniques.

PCC-CS402.3 Study of parallel architecture and interconnection network

Formal Language & Automata Theory

Code: PCC-CS403

Course Outcomes:

On completion of the course students will be able to

PCC-CS403.1 Write a formal notation for strings, languages and machines.

PCC-CS403.2 Design finite automata to accept a set of strings of a language.

PCC-CS403.3 For a given language determine whether the given language is regular or not.

PCC-CS403.4 Design context free grammars to generate strings of context free language.

PCC-CS403.5 Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars

PCC-CS403.6 Write the hierarchy of formal languages, grammars and machines.

PCC-CS403.7 Distinguish between computability and non-computability and Decidability and undecidability.

Design and Analysis of Algorithms

Code: PCC-CS404

Course Outcomes:

On completion of the course students will be able to

PCC-CS404.1 For a given algorithms analyse worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.

PCC-CS404.2 Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For a given problem develop the greedy algorithms.

PCC-CS404.3 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.

PCC-CS404.4 Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. For a given problems of dynamic-programming and

PCC-CS404.5 develop the dynamic programming algorithms, and analyse it to determine its computational complexity.

PCC-CS404,6 For a given model engineering problem model it using graph and write the corresponding algorithm to solve the problems.

PCC-CS404.7 Explain the ways to analyse randomized algorithms (expected running time, probability of error).

PCC-CS404.8 Explain what an approximation algorithm is. Compute the approximation factor of an approximation algorithm (PTAS and FPTAS).

Biology

Code: BSC 401

Course Outcomes:

On completion of the course students will be able to

BSC-401.1 Describe how biological observations of 18th Century that lead to major discoveries.

BSC-401.2 Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological

BSC-401.3 Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring

BSC-401.4 Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine

BSC-401.5 Classify enzymes and distinguish between different mechanisms of enzyme action.

BSC-401.6 Identify DNA as a genetic material in the molecular basis of information transfer.

BSC-401.7 Analyse biological processes at the reductionistic level

BSC-401.8 Apply thermodynamic principles to biological systems.

BSC-401.9 Identify and classify microorganisms.

Environmental Sciences

Code: MC-401

Course Outcomes:

On completion of the course students will be able to

MC-401.1 To understand the natural environment and its relationships with human activities.

MC-401.2 To apply the fundamental knowledge of science and engineering to assess environmental and health risk.

MC-401.3 To develop guidelines and procedures for health and safety issues obeying the environmental laws and regulations.

MC-401.4 Acquire skills for scientific problem-solving related to air, water, noise & land pollution.

Computer Architecture Lab

Code: PCC-CS492

Course Outcomes:

1 PCC-CS402.1

2 PCC-CS402.2

3 PCC-CS402.3

Design & Analysis Algorithm Lab

Code: PCC-CS494

Course Outcomes:

1 PCC-CS402.1

2 PCC-CS402.2

3 PCC-CS402.3

SEMESTER – V

Software Engineering

Code: ESC501

ESC501.1 Demonstrate knowledge of the distinction between critical and noncritical systems.

ESC501.2 Demonstrate the ability to manage a project including planning, scheduling, and testing and risk assessment/management.

ESC501.3 Author a software requirements document and demonstrate an understanding of the proper contents of a software requirements document.

ESC501.4 Demonstrate an understanding of the differences between real-time and non-real time systems.

ESC501.5 Identify specific components of a software design that can be targeted for reuse.

ESC501.6 Author a software testing plan and demonstrate proficiency in software development cost estimation.

Compiler Design

Code: PCC-CS501

Course Outcomes:

On completion of the course students will be able to

PCC-CS501.1 Understand given grammar specification develop the lexical analyser

PCC-CS501.2. Design a given parser specification design top-down and bottom-up parsers

PCC-CS501.3. Develop syntax directed translation schemes

PCC-CS501.4. Develop algorithms to generate code

Operating Systems

Code: PCC-CS502

Course Outcomes:

On completion of the course students will be able to

PCC-CS502.1. Create processes and threads.

PCC-CS502.2. Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time.

PCC-CS502.3. 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.

PCC-CS502.4. For 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.

Object Oriented Programming

Code: PCC-CS503

Course Outcomes:

On completion of the course students will be able to

PCC-CS503.1. Specify simple abstract data types and design implementations, using abstraction functions to document them.

PCC-CS503.2. Recognise features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity.

PCC-CS503.3. Name and apply some common object-oriented design patterns and give examples of their use.

PCC-CS503.4. Design applications with an event-driven graphical user interface.

Introduction to Industrial Management (Humanities III)

Code: HSMC-501

Course Outcomes:

On completion of the course students will be able to

HSMC-501.1. Interpret given organization structure, culture, climate and major provisions of factory acts and laws.

HSMC-501.2. Explain material requirement planning and store keeping procedure.

HSMC-501.3. Plot and analyse inventory control models and techniques.

HSMC-501.4. Prepare and analyse CPM and PERT for given activities.

HSMC-501.5. List and explain PPC functions.

Theory of Computation

Code: PEC-IT501A

Course Outcomes:

On completion of the course students will be able to

IT501A.1. Define a system and recognize the behaviour of a system. They will be able to minimize a system and compare different systems

IT501A.2. Convert Finite Automata to regular expression. Students will be able to check equivalence between regular linear grammar and FA.

IT501A.3. Minimize context free grammar. Student will be able to check equivalence of CFL and PDA.

IT501A.4. They will be able to design Turing Machine.

IT501A.5. Design Turing machine.

Artificial Intelligence

Code: PEC-IT501B

PEC-IT501B.1 The student will learn the basics of the theory and practice of Artificial Intelligence as a discipline about intelligent agents capable of deciding what to do, and do it.

PEC-IT501B.2 The student will be introduced to Artificial Intelligence (AI) programming.

PEC-IT501B.3 The student will learn to apply knowledge representation techniques and problem-solving strategies to common AI applications.

PEC-IT501B.4 The student will design simple software to experiment with various AI concepts and analyse results.

PEC-IT501B.5 The student will build self-learning and research skills to be able to tackle a topic of interest on his/her own or as part of a team.

PEC-IT501B.6 The students will analyse a problem, and identify and define the computing requirements appropriate to its solution.

Advanced Computer Architecture

Code: PEC-IT501C

PEC-IT501C.1 To define the Flynn's classification of computer architecture SISD, SIMD, MISD, MIMD.

PEC-IT501C.2 To explain how computer hardware has evolved to meet the needs of multi-processing systems.

PEC-IT501C.3 To construct a wide variety of memory technologies both internal and external and also able to Compute CPU and memory performance.

PEC-IT501C.4 To compare array processor and vector processors both in terms of parallelism in SIMD architecture.

PEC-IT501C.5 To evaluate different types of systems: pipelined, super-scalar, super-pipelined, super. scalar–super, pipelined architecture.

PEC-IT501C.6 To design the hardware of multiprocessors including cache coherence and synchronization.

Computer Graphics

Code: PEC-IT501D

PEC-IT501D.1 To remember and understand and analyse contemporary graphics principles and graphics hardware.

PEC-IT501D.2 To understand and apply geometrical transformations.

PEC-IT501D.3 To understand and demonstrate 2D transformation and apply it onto 2D image processing techniques.

PEC-IT501D.4 To understand and demonstrate 2D transformation and apply it onto 3D image processing techniques.

PEC-IT501D.5 To understand and demonstrate computer graphics animation.

Constitution of India

Code: MC-CS501

MC-CS501.1 Understand the emergence and evolution of Indian Constitution.

MC-CS501.2 Understand the structure and composition of Indian Constitution

MC-CS501.3 Understand and analyse federalism in the Indian context.

MC-CS501.4 Analyse local administrative institutions as a medium of decentralization

MC-CS501.5 Understand and analyse the three organs of the state in the contemporary scenario.

MC-CS501.6 Understand and Evaluate the Indian Political scenario amidst the emerging challenges.

MC-CS501.7 Evaluate Role and Functioning of Election Commission.

Software Engineering Lab

Code: ESC591

Course Outcomes:

ESC591.1 To understand the software engineering methodologies involved in the phases for project development.

ESC591.2 To gain knowledge about open source tools used for implementing software engineering methods.

ESC591.3 To exercise developing product-startups implementing software engineering methods.

ESC591.4 Learn simple optimization techniques

Operating System Lab

Code: PCC-CS592

Course Outcomes:

1.PCC-CS502.1

2.PCC-CS502.2

3.PCC-CS502.3

4.PCC-CS502.4

Object Oriented Programming Lab
Code: PCC-CS593

Course Outcomes:

- 1.PCC-CS503.1
- 2.PCC-CS503.2
- 3.PCC-CS503.3
- 4.PCC-CS503.4

SEMESTER – VI

Database Management Systems

Code: PCC-CS601

Course Outcomes:

On completion of the course students will be able to

PCC-CS601.1. For a given query write relational algebra expressions for that query and optimize the developed expressions

PCC-CS601.2. For a given specification of the requirement design the databases using E R method and normalization.

PCC-CS601.3. For a given specification construct the SQL queries for Open source and Commercial DBMS -MYSQL, ORACLE, and DB2.

PCC-CS601.4. For a given query optimize its execution using Query optimization algorithms

PCC-CS601.5. For a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.

PCC-CS601.6. Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.

Computer Networks

Code: PCC-CS602

Course Outcomes:

On completion of the course students will be able to

PCC-CS602.1. Understand research problem formulation.

PCC-CS602.2. Analyse research related information

PCC-CS602.3. Follow research ethics

PCC-CS602.4. Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.

PCC-CS602.5. Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasise the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.

PCC-CS602.6 Understand 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.

Advanced Algorithms

Code: PEC-IT601 A

Course Outcomes:

On completion of the course students will be able to

- PEC-IT601A.1. Analyze the complexity/performance of different algorithms.
- PEC-IT601A.2. Determine the appropriate data structure for solving a particular set of problems.
- PEC-IT601A.3. Categorize the different problems in various classes according to their complexity.
- PEC-IT601A.4. Students should have an insight of recent activities in the field of the advanced data structure.

Distributed Systems

Code: PEC-IT601B

Course Outcomes:

On completion of the course students will be able to

- PEC-IT601B.1. Design trends in distributed systems.
- PEC-IT601B.2. Apply network virtualization.
- PEC-IT601B.3. Apply remote method invocation and objects.

Software Engineering

Code:PEC-IT601C

- PEC-IT601C.1 Demonstrate knowledge of the distinction between critical and noncritical systems.
- PEC-IT601C.2 Demonstrate the ability to manage a project including planning, scheduling, and testing and risk assessment/management.
- PEC-IT601C.3 Author a software requirements document and demonstrate an understanding of the proper contents of a software requirements document.
- PEC-IT601C.4 Demonstrate an understanding of the differences between real-time and non-real time systems.
- PEC-IT601C.5 Identify specific components of a software design that can be targeted for reuse.
- PEC-IT601C.6 Author a software testing plan and demonstrate proficiency in software development cost estimation.

Image Processing

Code:PEC-IT601D

Course Outcomes:

On completion of the course students will be able to

- PEC-IT601D.1: understand the need for image transforms different types of image transforms and their properties.

PEC-IT601D.2: develop any image processing application.
PEC-IT601D.3: understand the rapid advances in Machine vision.
PEC-IT601D.4: learn different techniques employed for the enhancement of images.
PEC-IT601D.5: learn different causes for image degradation and overview of image restoration techniques.
PEC-IT601D.6: understand the need for image compression and to learn the spatial and frequency domain techniques of image compression.
PEC-IT601D.7: learn different feature extraction techniques for image analysis and recognition

Parallel and Distributed Algorithms

Code: PEC-IT602A

Course Outcomes:

On completion of the course students will be able to

PEC-IT602A.1 familiar with the concepts of parallel processing and understand the particular problems arising in programming of parallel machines;

PEC-IT602A.2 will be familiar with the parallel computing models and the “parallel-way of thinking” required in the design of parallel algorithms;

PEC-IT602A.3 will be able to apply the basic algorithmic techniques and design algorithms in a shared memory as well as a distributed memory environment;

PEC-IT602A.4 will understand and be able to apply basic parallel programming principles in a shared/ distributed memory environment

Data Warehousing and Data Mining

Code: PEC-IT602B

Course Outcomes:

After completion of course, students would be

PEC-IT602B.1. Study of different sequential pattern algorithms

PEC-IT602B.2. Study the technique to extract patterns from time series data and its application in real world.

PEC-IT602B.3. Can extend the Graph mining algorithms to Web mining

PEC-IT602B.4. Help in identifying the computing framework for Big Data

Human Computer Interaction

Code: PEC-IT602C

Course Outcomes:

On completion of the course students will be able to

PEC-IT602C.1. Differentiate between various software vulnerabilities.

- PEC-IT602C.2. Software process vulnerabilities for an organization.
- PEC-IT602C.3. Monitor resources consumption in a software.
- PEC-IT602C.4. Interrelate security and software development process.

Pattern Recognition

Code: PEC-IT602D

Course Outcomes:

At the end of this course, students will be able to

- PEC-IT602D.1. Explain and compare a variety of pattern classification, structural pattern recognition, and pattern classifier combination techniques.
- PEC-IT602D.2. Summarize, analyse, and relate research in the pattern recognition area verbally and in writing.
- PEC-IT602D.3. Apply performance evaluation methods for pattern recognition, and critique comparisons of techniques made in the research literature.
- PEC-IT602D.4. Apply pattern recognition techniques to real-world problems such as document analysis and recognition.
- PEC-IT602D.5. Implement simple pattern classifiers, classifier combinations, and structural pattern recognizers.

Numerical Methods

Code: OEC-IT601A

Course Outcomes:

At the end of this course, students will be able to:

- OEC-IT601A.1 Apply numerical methods to find our solution of algebraic equations using different methods under different conditions, and numerical solution of system of algebraic equations.
- OEC-IT601A.2 Apply various interpolation methods and finite difference concepts.
- OEC-IT601A.3 Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.
- OEC-IT601A.4 Work numerically on the ordinary differential equations using different methods through the theory of finite differences.
- OEC-IT601A.5 Work numerically on the partial differential equations using different methods through the theory of finite differences.

Human Resource Development and Organizational Behaviour

Code: OEC-IT601B

Course Outcomes:

On completion of this course, the students will be able to

OEC-IT601B.1: Demonstrate the applicability of the concept of organizational behaviour to understand the behaviour of people in the organization.

OEC-IT601B.2: Demonstrate the applicability of analysing the complexities associated with management of individual behaviour in the organization.

OEC-IT601B.3: Analyse the complexities associated with management of the group behaviour in the organization.

OEC-IT601B.4: Demonstrate how the organizational behaviour can integrate in understanding the motivation (why) behind behaviour of people in the organization.

Database Management System Lab

Code: PCC-CS691

Course Outcomes:

On completion of the course students will be able to

PCC-CS601.1.

PCC-CS601.2.

PCC-CS601.3.

PCC-CS601.4.

PCC-CS601.5.

PCC-CS601.6.

Computer Networks Lab

Code: PCC-CS692

Course Outcomes:

On completion of the course students will be able to

PCC-CS602.1.

PCC-CS602.2.

PCC-CS602.3.

PCC-CS602.4.

PCC-CS602.5.

PCC-CS602.6

SEMESTER – VII

Quantum Computing

Code: PEC-CS701A

Course Outcomes:

On completion of the course students will be able to

PEC-CS701A.1 Know the definition of qubit, quantum logic gates, quantum circuits and quantum algorithms

PEC-CS701A.2 Knowledge of Vector spaces, Matrices, Quantum state, Density operator and Quantum

PEC-CS701A.3 Understand how quantum parallelism is used in the simplest quantum algorithms such as Deutsch, period finding and quantum Fourier transform

PEC-CS701A.4 Simulate the Feynman processor numerically

PEC-CS701A.5 Know the basic requirements for implementation of quantum computers and classify the schemes for implementation of quantum computers

PEC-CS701A.6 Review the selected original scientific papers about quantum computers and quantum information.

Cloud Computing

Code: PEC-CS701B

Course Outcomes:

After successful completion of this course, student will be able to

PEC-CS701B.1 Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.

PEC-CS701B.2 Apply the fundamental concepts in datacentres to understand the trade-offs in power, efficiency and cost.

PEC-CS701B.3 Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.

PEC-CS701B.4 Analyse various cloud programming models and apply them to solve problems on the cloud.

Digital Signal Processing

Code: PEC-CS701C

Course Outcomes:

After successful completion of this course, student will be able to

- PEC-CS701C.1. Interpret, represent and process discrete/digital signals and systems
- PEC-CS701C.2. Thorough understanding of frequency domain analysis of discrete time signals.
- PEC-CS701C.3. Ability to design & analyse DSP systems like FIR and IIR Filter etc.
- PEC-CS701C.4. Practical implementation issues such as computational complexity, hardware resource limitations as well as cost of DSP systems or DSP Processors.
- PEC-CS701C.5. Understanding of spectral analysis of the signals

Multi-agent Intelligent Systems

Code: PEC-CS701D

Course Outcomes:

After successful completion of this course, student will be able to

- PEC-CS701D.1 Understand main principles of distributed AI
- PEC-CS701D.2 Analyse techniques from artificial intelligence (AI) can be used in distributed AI environments
- PEC-CS701D.3 Analyse various agent types and their characteristics
- PEC-CS701D.4 Understand game theory concepts relevant to multiagent systems
- PEC-CS701D.5 Interpret how do agents take strategical decisions
- PEC-CS701D.6 Interpret agent communication languages and interactions between agents.

Machine Learning

Code: PEC-CS701E

Course Outcomes:

After successful completion of this course, student will be able to

- PEC-CS701E.1. Gain knowledge about basic concepts of Machine Learning while having a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.
- PEC-CS701E.2. Identify machine learning techniques suitable for a given problem appreciating the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.
- PEC-CS701E.3. Solve the problems using various machine learning techniques
- PEC-CS701E.4. Apply Dimensionality reduction techniques.
- PEC-CS701E.5. Design application using machine learning techniques.

Neural Networks and Deep Learning

Code: PEC-CS702A

Course Outcomes:

After successful completion of this course, student will be able to

PEC-CS702A.1: Model Neuron and Neural Network, and to analyse ANN learning, and its applications.

PEC-CS702A.2: Perform Pattern Recognition, Linear classification.

PEC-CS702A.3: Develop different single layer/multiple layer Perception learning algorithms

PEC-CS702A.4: Design of another class of layered networks using deep learning principles.

Soft Computing

Code: PEC-CS702B

Course Outcomes:

After successful completion of this course, student will be able to

PEC-CS702B.1. Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory.

PEC-CS702B.2. Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic

PEC-CS702B.3. To understand the fundamental theory and concepts of neural networks, Identify different neural network architectures, algorithms, applications and their limitations

PEC-CS702B.4. Understand appropriate learning rules for each of the architectures and learn several neural network paradigms and its applications

PEC-CS702B.5. Reveal different applications of these models to solve engineering and other problems.

Adhoc –Sensor Network

Code: PEC-CS702C

Course Outcomes:

After successful completion of this course, student will be able to

PEC-CS702C.1 Explain the basic concepts of WIRELESS networks and challenges of adhoc and sensor networks

PEC-CS702C.2 Classify the design issues and different categories of MAC protocols

PEC-CS702C.3 Explain the various adhoc routing protocols and transport layer mechanisms

PEC-CS702C.4 Discuss the sensor characteristics and wsn layer protocols

PEC-CS702C.5 Illustrate the issues of routing in wsn and QoS related performance measurements

Information Theory and Coding

Code: PEC-CS702D

Course Outcomes:

After completion of the course, the student is able to

PEC-CS702D.1: Design the channel performance using Information theory.

PEC-CS702D.2: Comprehend various error control code properties

PEC-CS702D.3: Apply linear block codes for error detection and correction

PEC-CS702D.4: Apply convolution codes for performance analysis & cyclic codes for error detection and correction.

PEC-CS702D.5: Design BCH & RS codes for Channel performance improvement against burst errors.

Cyber Security

Code: PEC-CS702E

Course Outcomes:

After completion of the course, the student is able to

PEC-CS702E.1 Analyze and evaluate the cyber security needs of an organization.

PEC-CS702E.2 Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.

PEC-CS702E.3 Measure the performance and troubleshoot cyber security systems.

PEC-CS702E.4 Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.

PEC-CS702E.5 Comprehend and execute risk management processes, risk treatment methods, and key risk and performance indicators

PEC-CS702E.6 Design and develop a security architecture for an organization.

PEC-CS702E.7 Design operational and strategic cyber security strategies and policies.

Operation Research

Code: OEC-CS701A

Course Outcomes:

After completion of the course, the student is able to

OEC-CS701A.1 Be able to understand the application of OR and frame a LP Problem with solution – graphical and through solver add in excel (software).

OEC-CS701A.2 Be able to build and solve Transportation and Assignment problems using appropriate method.

OEC-CS701A.3 Be able to design and solve simple models of CPM and queuing to improve decision making and develop critical thinking and objective analysis of decision problems.

OEC-CS701A.4 Be able to solve simple problems of replacement and implement practical cases of decision making under different business environments.

OEC-CS701A.5 Enables to take best course of action out of several alternative courses for the purpose of achieving objectives by applying game theory and sequencing models.

Multimedia Technology

Code: OEC-CS701B

Course Outcomes:

After completion of the course, the student is able to

OEC-CS701B.1. Developed understanding of technical aspect of Multimedia Systems.

OEC-CS701B.2. Understand various file formats for audio, video and text media.

OEC-CS701B.3. Develop various Multimedia Systems applicable in real time.

OEC-CS701B.4. Design interactive multimedia software.

OEC-CS701B.5. Apply various networking protocols for multimedia applications.

OEC-CS701B.6. To evaluate multimedia application for its optimum performance.

Introduction to Philosophical Thoughts

Code: OEC-CS701C

Course Outcomes:

After completion of the course, the student is able to

OEC-CS701C.1. Describe and distinguish key philosophical concepts in the main subfields of philosophy, including concepts such as free will, mind, knowledge, belief, reality, faith, reason, good, etc.

OEC-CS701C.2. Read and comprehend philosophical texts, both classical and contemporary.

OEC-CS701C.3. Discuss core philosophical problems, such as whether there is a god, what does it mean to be conscious, are we free to make choices, what is justice, etc.

OEC-CS701C.4. Explain and defend a position on basic philosophical problems from different religions.

Project Management and Entrepreneurship

Code: HSMC 701

Course Outcomes:

After completion of the course, the student is able to

HSMC 701.1. Have the ability to discern distinct entrepreneurial traits

HSMC 701.2. Know the parameters to assess opportunities and constraints for new business ideas

HSMC 701.3. Understand the systematic process to select and screen a business idea

HSMC 701.4 design strategies for successful implementation of ideas

Project-II

Code: PROJ-IT781

Course Outcomes:

After completion of the course, the student is able to

PROJ-IT781.1 Plan and identify materials, processes and other resources optimally

PROJ-IT781.2 Develop innovative and creative ideas

PROJ-IT781.3 Develop leadership, interpersonal skill and team work

PROJ-IT781.4 Develop sense of environmental responsibility

PROJ-IT781.5 Purchase raw material/standard parts

PROJ-IT781.6 Interpret the drawings, manufacture, assemble, inspect & if necessary, modify the parts/unit/assembly of the project work

PROJ-IT781.7 Familiar with fast changes in technology

SEMESTER – VIII

Signal and Networks

Code: PEC-CS801A

Course Outcomes:

On completion of the course, student will be able to

PEC-CS801A.1 Understand mathematical description and representation of continuous and discrete time of signals and systems.

PEC-CS801A.2 Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.

PEC-CS801A.3 Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.

PEC-CS801A.4 Understand the limitations of Fourier transform and need for Laplace transform and develop the ability to analyse the system in s- domain.

PEC-CS801A.5 Understand the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event.

Cryptography and Network Security

Code: PEC-CS801B

Course Outcomes:

On completion of the course, student will be able to

PEC-CS801B.1. Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory.

PEC-CS801B.2. Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication

PEC-CS801B.3. Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes

PEC-CS801B.4. Apply different digital signature algorithms to achieve authentication and create secure applications

PEC-CS801B.5. Apply network security basics, analyse different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP.

6. Apply the knowledge of cryptographic utilities and authentication mechanisms to design secure applications

Natural Language Processing

Code: PEC-CS801C

Course Outcomes:

On completion of the course, student will be able to

PEC-CS801C.1 Understanding of the fundamental mathematical models and algorithms in the field of NLP.

PEC-CS801C.2 Apply these mathematical models and algorithms in applications in software design and implementation for NLP.

PEC-CS801C.3 Understand the principles of language resource annotation and its use in machine learning applications and apply the above principles in analysis of data and acquire intended information through the use of available tools.

PEC-CS801C.4 Understand the design and implementation issues in various NLP applications such as information retrieval and information extraction.

PEC-CS801C.5 Understand the complexity of speech and the challenges facing speech engineers.

PEC-CS801C.6 Understand the principles of automatic speech recognition and synthesis.

PEC-CS801C .7 Problem solving using systematic ways and learning independently.

Web and Internet Technology

Code: PEC-CS801D

Course Outcomes:

On completion of the course, student will be able to

PEC-CS801D.1 Develop a dynamic webpage by the use of java script andDHTML.

PEC-CS801D.2 Write a well-formed / valid XML document.

PEC-CS801D.3 Students will be able to connect a java program to a DBMS and perform insert,update and delete operations on DBMS table.

PEC-CS801D.4 Write a server-side java application called Servlet to catchform data sent from client, process it and store it on database.

PEC-CS801D.5 Write a server-side java application called JSP to catch formdata sent from client and store it on database.

Internet of Things

Code: PEC-CS801E

Course Outcomes:

On completion of the course the student should be able to

PEC-CS801E.1 Understand the vision of IoT from a global context.

PEC-CS801E.2 Determine the Market perspective of IoT.

PEC-CS801E.3 Use of Devices, Gateways and Data Management in IoT.

PEC-CS801E.4 Application of IoT in Industrial and Commercial Building Automation and Real-World Design Constraints.

PEC-CS801E.5 Building state of the art architecture in IoT.

Big Data Analytics

Code: OEC-CS801A

Course Outcomes:

On completion of the course the student should be able to

OEC-CS801A.1 Describe big data and use cases from selected business Domains

OEC-CS801A.2 Explain NoSQL big data management

OEC-CS801A.3 Install, configure, and run Hadoop and HDFS

OEC-CS801A.4 Perform map-reduce analytics using Hadoop

OEC-CS801A.5 Use Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data analytics

Cyber Law and Ethics

Code: OEC-CS801B

Course Outcomes:

On completion of the course the student should be able to

OEC-CS801B.1. Analyse various types of cybercrime and formulate procedures for real world cyber-crime Investigations

OEC-CS801B.2. Resolve challenges posed to law enforcement agents, policy makers and prosecutors

OEC-CS801B.3. Find solutions in cybercrime investigations, evidence and applicable law for real world case studies

OEC-CS801B.4. Use and Analyse the software tools and methods currently available for finding illegal activities on computer disks and in computer networks.

OEC-CS801B.5. Analyse the criminal activity on the Internet and propose available tools to prevent such activity.

Mobile Computing

Code: OEC-CS801C

Course Outcomes:

On completion of the course the student should be able to

OEC-CS801C.1: Understand and identify the GSM, GPRS and Bluetooth software model for mobile computing.

OEC-CS801C.2: The ability to develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts.

OEC-CS801C.3: Understanding of the characteristics and limitations of mobile hardware devices including their user-interface modalities

OEC-CS801C.4: Analyse QoS over wire and wireless channels

OEC-CS801C.5: Able to promote the awareness of the life-long learning, business ethics, professional ethics and current marketing scenarios.

Robotics

Code: OEC-IT801D

Course Outcomes:

On completion of the course the student should be able to

OEC-IT801D.1 Understand knowledge of the relationship between mechanical structures of industrial robots and their operational workspace characteristics.

OEC-IT801D.2 Demonstrate an ability to apply spatial transformation to obtain forward kinematics equation of robot manipulators.

OEC-IT801D.3 Demonstrate an ability to solve inverse kinematics of simple robot manipulators.

OEC-IT801D.4 Demonstrate an ability to obtain the Jacobian matrix and use it to identify singularities.

OEC-IT801D.5 Analyse and generate joint trajectory for motion planning.

OEC-IT801D.6 Demonstrate knowledge of robot controllers.

Soft Skill & Interpersonal Communication

Code: OEC-CS801E

Course Outcomes:

On completion of the course the student should be able to

OEC-CS801E.1 Effectively communicate through verbal/oral communication and improve the listening skills

OEC-CS801E.2 Write precise briefs or reports and technical documents.

OEC-CS801E.3 Actively participate in group discussion / meetings / interviews and prepare & deliver presentations.

OEC-CS801E.4 Become more effective individual through goal/target setting, self-motivation and practicing creative thinking.

OEC-CS801E.5 Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.

E-Commerce & ERP

Code: OEC-CS802A

Course Outcomes:

On completion of the course the student should be able to

OEC-CS802A.1. To understand the basic structure of of E-commerce on business models and strategy and describing the major types of E-commerce.

OEC-CS802A.2. Explain the process that should be followed in building an E-commerce presence.

OEC-CS802A.3. To identify implementation strategy used for ERP.

OEC-CS802A.4. To apply design principles for various business modules in ERP.

OEC-CS802A.5. To apply different emerging technologies for implementation of ERP.

OEC-CS802A.6 To analyse security issues in ERP.

OEC-CS802A.7. To acquire ERP concepts for real world applications.

Micro-electronics and VLSI Design

Code: OEC-CS802B

Course Outcomes:

On completion of the course the student should be able to

OEC-CS802B.1. Understand the static and dynamic behaviour of MOSFETs (Metal Oxide Semiconductor Field Effect Transistors) and the secondary effects of the MOS transistor model.

OEC-CS802B.2. To be aware about the trends in semiconductor technology, and how it impacts scaling and its effect on device density, speed and power consumption.

OEC-CS802B.3. To understand MOS transistor as a switch and its capacitance.

OEC-CS802B.4. Student will be able to design digital systems using MOS circuits (Static and Switching characteristics of inverters)

OEC-CS802B.5. Able to learn Layout, Stick diagrams, Fabrication steps.

OEC-CS802B.6. Understand the concept behind ASIC (Application Specific Integrated Circuits) design and the different implementation approaches used in industry.

Economic Policies in India

Code: OEC-CS802C

Course Outcomes:

On completion of the course the student should be able to

OEC-CS802C.1. Analyse the basic concepts in economic administration, process of new economic policy and the impact of liberalization, privatization and globalization.

OEC-CS802C.2. Understand how planning takes place at the national, state and local levels along with the various institutions involved in the process of planning.

OEC-CS802C.3. Describe the factors of public undertakings, Industrial policy resolutions and the impact of new economic policy.

OEC-CS802C.4. Elaborate the process involved in Budgeting and the role of Ministry of Finance, Comptroller and Auditor General of India.

OEC-CS802C.5. Explain the reforms taking place in Indian Economy and the impact of Public private partnership in Economic Development.