



Maharshi Karve Stree Shikshan Samstha's

K. B. Joshi Institute of Information Technology

(* Approved by Govt. of Maharashtra, *NAAC Accredited)

(Affiliated by S.N.D.T. Women's University, Mumbai)

Faculty: Science & Technology

Program Outcome Document

Program: Master of Computer Applications

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Program 4: Master Of Computer Applications Program Code: 019

1. Objectives

- To provide technical education to women to catalyzes their empowerment.
- To fulfill the national need for trained teachers and researchers in Computer Science.
- To promote advanced research, doctoral and postdoctoral work.
- To support the efforts of the University to promote computer awareness and utilization in the various departments.

2. Major Thrust Areas

- Train highly competent computer software professionals needed by the industry.
- Strengthen teaching, research and consulting in the area of computer applications.
- Develop software for the improvement of educational testing and software for students with a learning disability.
- Promote teaching materials and manpower for computer science education.
- Participate actively in professional bodies and industry to contribute to the society at large.
- Interact with some of the best in the computing profession to give exposure to students and faculty.
- Establish links with national and international organizations for advanced training and research in computer science.

Semester I

Course Objective and Outcome MCA

Subject: Mathematical Foundation of Computer Science

Subject Code: 1101

Theory: 3+ Tutorial:1

COURSE OBJECTIVES:

1. To understand the mathematical fundamentals that is prerequisites for a variety of courses in computer Science and Applications.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. To understand the basic notions of Induction and state machine.
2. To understand graphs and its applications in Computer Science.
3. To understand the methods of statistical inference, and the role probability in computer science.
4. To be able to perform correct and meaningful statistical analyses of simple to moderate complexity.

Subject: RESEARCH METHODOLOGY AND IPR

Subject Code: 1102

Theory: 3+ Tutorial:1

COURSE OBJECTIVES

- To give an overview of the research methodology and explain the technique of defining a research problem
- To explain the functions of the literature review in research.
- To explain carrying out a literature search, its review, developing theoretical and conceptual frameworks and writing a review.
- To explain various research designs and their characteristics.
- To explain the details of sampling designs, measurement and scaling techniques and also different methods of data collections.
- To explain several parametric tests of hypotheses and Chi-square test.
- To explain the art of interpretation and the art of writing research reports.
- To explain various forms of the intellectual property, its relevance and business impact in the changing global business environment.
- To discuss leading International Instruments concerning Intellectual Property Rights.

COURSE OUTCOME

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

1. Understand research problem formulation.
2. Analyze research related information.
3. Follow research ethics
4. Understand that today's world is controlled by Computer, Information Technology, but

tomorrow world will be ruled by ideas, concept, and creativity.

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

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.

Subject: Advanced Data Structure

Subject Code: 1103

Lecture: 03

COURSE OBJECTIVES:

1. Understand and apply linear data structures-List, Stack and Queue.
2. Understand the graph algorithms.
3. Learn different algorithms analysis techniques.
4. Apply data structures and algorithms in real time applications
5. Able to analyze the efficiency of algorithm.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Describe, explain and use abstract data types including stacks, queues and lists.
2. Design and Implement Tree data structures and Sets.
3. Able to understand and implement nonlinear data structures – graphs
4. Able to understand various algorithm design and implementation

Subject: Advanced JAVA

Subject Code: 1104

Lecture: 03

COURSE OBJECTIVES:

1. Understanding the basic concepts regarding J2EE
2. To understand GUI based applications and events associated with it.
3. Students will also be exposed to advanced topics including multithreading, internet networking, and JDBC database connectivity.
4. Understanding server-side computing with servlets and embedding html pages with JSP, jQuery, JS, JS and JSON.
5. Students will also be exposed to Spring framework with MVC architecture.
6. Understanding to JMS support to Springs.
7. Understanding to hibernate and querying with HQL.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Understanding of advance web concepts associated with JAVA.
2. Familiarization with hibernate.
3. Familiarization with the MVC architecture.
4. Familiarization with the Spring framework.

Subject: Computer Network Programming using Linux

Subject Code: 1105

Lecture: 03

COURSE OBJECTIVES:

1. Understanding the basic concepts regarding networking.
2. To understand to Linux utilities.
3. To understand file handling, signals.
4. To understand IPC, network programming in Java.
5. To understand processes to communicate with each other across a Computer Network.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Understanding of the working principle of Socket programming.
2. Familiarization with the IPC using Linux

Subject: ADVANCED DATA STRUCTURE LAB

Subject Code: 1201

Practical: 04

COURSE OBJECTIVES:

1. Understand and apply linear data structures-List, Stack and Queue.
2. Understand the graph algorithms.
3. Learn different algorithms analysis techniques.
4. Apply data structures and algorithms in real time applications
5. Able to analyze the efficiency of algorithm.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. The student should be able to choose appropriate data structures, understand the ADT/libraries, and use it to design algorithms for a specific problem.
2. Students should be able to understand the necessary mathematical abstraction to solve problems.
3. To familiarize students with advanced paradigms and data structure used to solve algorithmic problems.
4. Student should be able to come up with analysis of efficiency and proofs of correctness.

Subject: ADVANCED JAVA LAB
Subject Code: 1202
Practical: 04

COURSE OBJECTIVES:

1. To understand GUI based applications and events associated with it.
2. Understanding the advance multithreading, internet networking, and JDBC database connectivity concepts.
3. Understanding server-side computing with servlets and embedding html pages with JSP, jQuery, JS, JS and JSON.
4. Students will also be exposed to Spring framework with MVC architecture.
5. Understanding to JMS support to Springs.
6. Understanding to hibernate and querying with HQL.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Understanding of advance web concepts associated with JAVA.
2. Familiarization with hibernate.
3. Familiarization with the MVC architecture.
4. Familiarization with the Spring framework.

Subject: Computer Network Programming Lab
Subject Code: 1203
Practical: 04

COURSE OBJECTIVES:

Understanding the basic concepts regarding networking

1. To understand to Linux utilities
2. To understand file handling, signals.
3. To understand IPC, network programming in Java.
4. To understand processes to communicate with each other across a Computer Network.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Understanding of the working principle of Socket programming
2. Familiarization with the IPC using Linux

Subject: Research paper I - Literature Review (Review paper)
Subject Code: 1204
Practical: 02

The student tasks and responsibilities are detailed in the list below:

1. Choose a topic and submit it to the allotted faculty supervisor for approval.
2. Once topic is approved, make research plan with help from supervisor.
3. Work on review in consultation with the supervisor.

4. Hand-in final version of review to supervisor.
5. Internal presentation of the review paper will be conducted in the department.
6. The evaluation of the review paper will be done on the basis of Rubrics.
7. Supervisor hand over marks to office for the result purpose.

SEMESTER - II

Subject: MANAGERIAL ECONOMICS

Subject Code: 2101

Lecture: 03 + Tutorial :01

COURSE OBJECTIVES:

1. To integrate the basic concepts of economics with the tools of mathematics and statistics in order to analyze and make optimal business decisions.

COURSE OUTCOMES:

After the completion of the course, students will be able to –

1. Understand the roles of managers in firms.
2. Understand the internal and external decisions to be made by managers.
3. Analyze the demand and supply conditions and assess the position of a company.
4. Design competition strategies, including costing, pricing, product differentiation, and market environment according to the natures of products and the structures of the markets.
5. Analyze real-world business problems with a systematic theoretical framework.
6. Make optimal business decisions by integrating the concepts of economics, mathematics and statistics.

Subject: SOFTWARE ARCHITECTURE

Subject Code: 2102

Lecture: 03

COURSE OBJECTIVES:

1. To understand importance of architecture in building effective, efficient, competitive software product.
2. To understand principal design decisions governing the system.
3. To understand role of architecture in software engineering.
4. To understand designing application from architectural perspective.
5. To understand different notations used for capturing design decisions.
6. To understand different functional and non-functional properties of complex software systems.

COURSE OUTCOMES:

1. Students will cite knowledge of various approaches to document a software system (Remembering).
2. Students will be able to describe functional and non-functional requirements (Understanding).
3. Students will be able to use proper architecture for software (Applying).
4. Students will be able to categorize different components used in the software system

(Analyzing).

5. Students will be able to choose from different architectural styles (Evaluating).

6. Students will be able to improve quality of software by selecting proper architecture (Creating).

Subject: ARTIFICIAL INTELLIGENCE

Subject Code: 2103

Lecture: 03

COURSE OBJECTIVES:

Students will be able to

1. Understand fuzzy logic, ANN Model Curriculum of Engineering & Technology PG Courses [Volume-I] [354].

2. Understand GA & EP.

COURSE OUTCOMES:

Students will be able to-

1. Learn the concepts of biological foundations of artificial neural networks.

2. Learn Feedback networks and radial basis function networks and fuzzy logics.

3. Identify fuzzy and neural network.

4. Acquire the knowledge of GA.

Subject: Advanced Databases

Subject Code: 2104

Lecture: 03

COURSE OBJECTIVES:

1. The objective of course is to provide insight to advance database architectures, normalization techniques and integrity rules. It also includes parallel database systems, object-oriented models along with spatial and temporal databases.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Able to understand relational database management systems, normalization to make efficient retrieval from database and query.

Subject: Elective-I: Digital Image Processing

Subject Code: 2105

Lecture: 03

COURSE OBJECTIVES:

1. To introduce the fundamental problems of digital image processing (DIP).

2. To introduce the main concepts and techniques used to solve those.

3. To enable participants to implement solutions for reasonably complex problems, and to

apply those to own images.

4. To enable participants to understand basic DIP methodology that is discussed in the Digital image processing literature, and applications of DIP across a broad range of scientific disciplines.

5. To motivate students to experience that DIP is a field where signal processing algorithms and methods become visual.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Understand image representation in digital form.
2. Enhance image quality using image enhancement techniques.
3. Filter given image using frequency domain filtering technique.
4. Select the right image restoration technique to remove degradation from given image.
5. Represent image using minimum number of bits using image compression.
6. Understand image segmentation technique.
7. Do morphological operations on given image.

Subject: Elective-I Ethical Hacking

Subject Code: 2105

Lecture: 03

COURSE OBJECTIVES:

1. Introduces the concepts of Ethical Hacking and gives the students the opportunity to learn about different tools and techniques in Ethical hacking and security and practically apply some of the tools.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Understand the core concepts related to malware, hardware and software vulnerabilities and their causes.
2. Understand ethics behind hacking and vulnerability disclosure.
3. Appreciate the Cyber Laws and impact of hacking.
4. Exploit the vulnerabilities related to computer system and networks using state of the art tools and technologies.

Subject: Elective - I IOT

Subject Code: 2105

Lecture: 03

COURSE OBJECTIVES:

1. To understand what is Internet of things.
2. Describe architecture, Design, underlying technologies, platforms and cloud interface.

COURSE OUTCOMES:

By the end of the course, students should be able to -

1. Explain what is internet of things.
2. Explain architecture and design of IoT.

3. Describe the objects connected in IoT.
4. Understand the underlying Technologies.
5. Understand the platforms in IoT.
6. Understand cloud interface to IoT.

Subject: ELECTIVE I – GAME Theory

Subject Code: 2105

Lecture: 03

COURSE OBJECTIVES:

After leaving this class, the student will:

1. Appreciate that game programming is really programming first, game second
2. Understand how to architect a game codebase so that it is flexible and easy to work amongst a team of programmers working concurrently
3. know how to debug code, and how to write code to be debugged
4. Understand the importance of data-driving initialization (properties) and execution (scripting) so that iteration can be done by non-programmers
5. understand common modern asset management practices
6. have some instinct for the performance tuning of video game code
7. understand cross-platform porting issues, and the implications of platform
8. understand the role of the programmer in a typical professional game company setting

COURSE OUTCOMES:

After completion of course, students would be able to:

Be a better C++ programmer than they were when they entered the class.

Subject: Elective-I Block Chain

Subject Code: 2105

Lecture: 03

COURSE OBJECTIVES:

By the end of the course, students will be able to

1. Understand how blockchain systems (mainly Bitcoin and Ethereum) work and to securely interact with them.
2. Design, build, and deploy smart contracts and distributed applications.

COURSE OUTCOMES:

1. Explain design principles of Bitcoin and Ethereum.
2. Explain Nakamoto consensus.
3. Explain the Simplified Payment Verification protocol.
4. List and describe differences between proof-of-work and proof-of-stake consensus.
5. Interact with a blockchain system by sending and reading transactions.
6. Design, build, and deploy a distributed application.
7. Evaluate security, privacy, and efficiency of a given blockchain system.

Subject: Web Engineering LAB
Subject Code:2201
Practical: 04

COURSE OBJECTIVES:

1. To develop an ability to design and implement static and dynamic website.
2. Choose best technologies for solving web client/server problems.
3. Create conforming web pages.
4. Use JavaScript for dynamic effects.
5. To prepare PHP scripts.
6. Use JavaScript & PHP to validate form input entry.
7. Understand, analyze and create XML documents and XML Schema.
8. Understand, analyze and build web applications using PHP.
9. Use appropriate client-side or Server-side applications.

COURSE OUTCOMES:

Upon completion of the course, graduates will be able to –

1. Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how.
2. Create web pages using HTML and Cascading Styles sheets.
3. Analyze a web page and identify its elements and attributes.
4. Create dynamic web pages using JavaScript.
5. Build web applications using PHP.
6. Create XML documents and XML Schema.
7. Understand, analyze and apply the role of languages like HTML, CSS, XML, JavaScript, PHP and protocols in the workings of the web and web applications.
8. Have a Good grounding of Web Application Terminologies like JSON, jQuery, Angular Js, Node.js.

Subject: Software Testing and Quality Assurance LAB
Subject Code:2202
Practical: 04

COURSE OBJECTIVES:

1. To understand software testing and quality assurance as a fundamental component of software life cycle.
2. To define the scope of SW T & QA projects.
3. To efficiently perform T & QA activities using modern software tools.
4. To estimate cost of a T & QA project and manage budgets.
5. To prepare test plans and schedules for a T&QA project.
6. To develop T & QA project staffing requirements.
7. To effectively manage a T & QA project.

COURSE OUTCOMES:

Upon completion of the course, graduates will be able to –

1. Select and classify measurement scales and models, software metrics and measures addressing software quality and reliability.
2. Conduct unit and integration tests by determining test design, test automation, test coverage criteria using testing frameworks and test adequacy assessment using control flow, data

flow, and program mutations.

3. Apply suitable higher order testing techniques and methods in order to achieve verified and validated software by following testing best practices.
4. Demonstrate the skillset as a tester to neutralize the consequences of wicked problems by narrating effective test cases and test procedures.
5. Adapt to various test processes, types of errors and fault models and methods of test generation from requirements for continuous quality improvement of the software system along with Software Quality best practices usage.
6. Apply software testing cycle in relation to software development and project management focusing incidents and risks management within a project towards efficient delivery of software solutions and implement improvements in the software development processes by making use of standards and baselines.

Subject: MOBILE COMPUTING LAB

Subject Code:2203

Practical: 04

COURSE OBJECTIVES:

1. Know the components and structure of mobile application development frameworks for Android and windows OS-based mobiles.
2. Understand how to work with various mobile application development frameworks.
3. Learn the basic and important design concepts and issues of development of mobile applications.
4. Understand the capabilities and limitations of mobile devices. Demonstrate the android features and create

COURSE OUTCOMES:

1. Design and Implement various mobile applications using emulators.
2. Deploy applications to hand-held devices

Subject: ARTIFICIAL INTELLIGENCE LAB

Subject Code:2204

Practical: 04

COURSE OBJECTIVES:

To create appreciation and understanding of both the achievements of AI

Students will be able to:

Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.

To impart basic proficiency in representing difficult real-life problems in a state space representation so as to solve them using AI techniques like searching and game playing.

COURSE OUTCOMES:

Students will be able to -

1. Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents. function networks and fuzzy logics.
2. Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing

Subject: Advanced Database LAB

Subject Code:2205

Practical: 04

COURSE OBJECTIVES:

1. Understand the syntax to query various databases.
2. To design and implement various algorithms and techniques.

COURSE OUTCOMES:

On completion of course the student should be able to

1. Effectively use the various databases.
2. To implement the queries on various databases.

Subject: Research paper II - Research Mini Project

Subject Code:2206

Practical: 02

SEMESTER - III

Subject: CYBER SECURITY

Subject Code: 3101

Lecture: 03

COURSE OBJECTIVES:

1. To understand and identify different types cybercrime and cyber law
2. To recognized Indian IT Act 2008 and its latest amendments
3. To learn various types of security standards compliances

COURSE OUTCOMES:

Learner will be able to...

1. Understand the concept of cybercrime and its effect on outside world
2. Interpret and apply IT law in various legal issues
3. Distinguish different aspects of cyber law
4. Apply Information Security Standards compliance during software design and development

Subject: DATA SCIENCE AND ANALYTICS

Subject Code: 3102

Lecture: 03

COURSE OBJECTIVE

1. Provide you with the knowledge and expertise to become a proficient data scientist.
2. Demonstrate an understanding of statistics and machine learning concepts that are vital for data science
3. Produce Python code to statistically analyze a dataset
4. Critically evaluate data visualizations based on their design and use for communicating stories from data

COURSE OUTCOME

1. Explain how data is collected, managed and stored for data science
2. Understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists
3. Implement data collection and management scripts using MongoDB

Subject: Cloud Computing

Subject Code: 3103

Lecture: 03

COURSE OBJECTIVES:

1. The student will learn how to apply trust-based security model to real-world security problems.
2. An overview of the concepts, processes, and best practices needed to successfully secure information within Cloud infrastructures.
3. Students will learn the basic Cloud types and delivery models and develop an understanding of the risk and compliance responsibilities and Challenges for each Cloud type and service delivery model.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Identify security aspects of each cloud model
2. Develop a risk-management strategy for moving to the Cloud
3. Implement a public cloud instance using a public cloud service provider
4. Apply trust-based security model to different layer

Subject: Machine Learning

Subject Code: 3104

Lecture: 03

COURSE OBJECTIVES:

1. Able to analyze the efficiency of algorithm.
2. Understand the features of machine learning to apply on real world problems.
3. To learn the concept of how to learn patterns and concepts from data.
4. To design and analyze various machine learning algorithms and techniques with a modern outlook focusing on recent advances.
5. Explore supervised and unsupervised learning paradigms of machine learning.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Extract features that can be used for a particular machine learning approach in various applications.
2. To compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach.
3. To mathematically analyze various machine learning approaches and paradigms.

Subject: ELECTIVE II - SOFT COMPUTING

Subject Code: 3105

Lecture: 03

COURSE OBJECTIVES:

1. To introduce soft computing concepts and techniques and foster their abilities in designing appropriate technique for a given scenario.
2. To implement soft computing-based solutions for real-world problems.
3. To give students knowledge of non-traditional technologies and fundamentals of artificial neural networks, fuzzy sets, fuzzy logic, genetic algorithms.
4. To provide students hand-on experience on Scilab to implement various strategies.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Identify and describe soft computing techniques and their roles in building intelligent machines
2. Apply fuzzy logic and reasoning to handle uncertainty and solve various engineering Model Curriculum of Engineering & Technology PG Courses [Volume-I][18] problems.
3. Apply genetic algorithms to combinatorial optimization problems.
4. Evaluate and compare solutions by various soft computing approaches for a given problem.

Subject: ELECTIVE II GEOGRAPHICAL INFORMATION SYSTEMS

Subject Code: 3105

Lecture: 03

COURSE OBJECTIVE:

1. To introduce the fundamentals and components of Geographic Information System.
2. To provide details of spatial data structures and input, management and output processes.

COURSE OUTCOME:

1. The basic concepts and components of GIS.
2. The techniques used for storage of spatial data and data compression.
3. The practices used for input, management and output of spatial data.
4. Concepts of spatial data quality and data standards.

Subject: ELECTIVE II – CYBER PHYSICAL SYSTEM

Subject Code: 3105

Lecture: 03

COURSE OBJECTIVES:

The objective of this course is to develop an exposition of the challenges in implementing a cyber-physical system from a computational perspective, but based equally on the principles of automated control. The course aims to expose the student to real world problems in this domain and provide a walk through the design and validation problems for such systems.

COURSE OUTCOMES:

After completion of course, students would be able to:

- 1) The general nature of distributed cyber-physical systems, how they can be modeled and the role of modeling to ensure system quality and timeliness in development processes.
- 2) Analyzing existing cyber-physical systems. Specifying, design and implementation of new cyber-physical systems according to the defined requirements.
- 3) Application of the principles for software design of distributed cyber-physical systems.

Subject: Elective-II: Natural Language Processing

Subject Code: 3105

Lecture: 03

COURSE OBJECTIVES:

1. To learn the basics of Natural Language Processing and its applications.
2. To learn linguistics essentials and building blocks of Natural Language Processing.
3. To learn the techniques in natural language processing.
4. Be familiar with natural language understanding and generation.
5. To understand the information retrieval techniques.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Understand different building blocks of NLP.
2. Design algorithms for NLP problems.
3. Understand machine translation and its techniques.
4. Learn and use different tools for NLP.

Subject: ELECTIVE II BIG DATA ANALYTICS

Subject Code: 3105

Lecture: 03

COURSE OBJECTIVES:

1. Understand big data for business intelligence. Learn business case studies for big data analytics.
2. Understand no sql big data management. Perform map-reduce analytics using Hadoop and related too.

COURSE OUTCOMES:

1. Describe big data and use cases from selected business domains.
2. Explain NoSQL big data management.
3. Install, configure, and run Hadoop and HDFS.
4. Perform map-reduce analytics using Hadoop.
5. Use Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data analytics.

Subject: Data science and Analytics lab (Content: Implementation using Python)

Subject Code: 3201

Practical:04

COURSE OBJECTIVE:

1. To introduce the fundamentals and components of Data science and Analytics
2. To provide practical python programming for Data science and Analytics

COURSE OUT COME:

1. Use Pandas Data Frames, Numpy multi-dimensional arrays, and SciPy libraries to work with a various dataset.
2. We will introduce you to pandas, an open-source library, and we will use it to load, manipulate, analyze, and visualize cool datasets.

Subject:Cloud Computing LAB

Subject Code: 3202

Practical:04

COURSE OBJECTIVES:

1. To develop web applications in cloud
2. To learn the design and development process involved in creating a cloud-based application
3. To learn to implement and use parallel programming using Hadoop

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Configure various virtualization tools such as Virtual Box, VMware workstation.
2. Design and deploy a web application in a PaaS environment.
3. Learn how to simulate a cloud environment to implement new schedulers.
4. Install and use a generic cloud environment that can be used as a private cloud.
5. Manipulate large data sets in a parallel environment.

Subject:SOFT COMPUTING LAB

Subject Code: 3203

Practical:04

COURSE OBJECTIVES:

1. The main objective of the Soft Computing Techniques to Improve Data Analysis Solutions is to strengthen the dialogue between the statistics and soft computing research communities in order to cross-pollinate both fields and generate mutual improvement activities.
2. Soft Computing is a consortium of methodologies which collectively provide a body of concepts and techniques for designing intelligent systems.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems

2. Apply genetic algorithms to combinatorial optimization problems
3. Apply neural networks to pattern classification and regression problems

Subject: ELECTIVE II GEOGRAPHICAL INFORMATION SYSTEMS(LAB)

Subject Code: 3203

Practical:04

COURSE OBJECTIVE:

1. To introduce the fundamentals and components of Geographic Information System.
2. To provide practical on spatial data structures and input, management and output processes.

COURSE OUTCOME:

1. Prepare the different geospatial layers.
2. Compute geometric measurements and perform spatial analysis.
3. Create high-quality maps and associated graphics.

Subject: ELECTIVE II – CYBER PHYSICAL SYSTEM LAB

Subject Code: 3203

Practical:04

COURSE OBJECTIVES:

1. Students will prove that their robots always operate within safety specifications, even when malicious robots (called rogue-bots) designed by other students are added to the environment.
2. The 6th and final lab will be open-ended, allowing students to creatively demonstrate what they have learned.

COURSE OUTCOMES:

After completion of course, students would be able to:

- 1) Analyzing existing cyber-physical systems. Specifying, design and implementation of new cyber-physical systems according to the defined requirements.

Subject: Natural Language Processing LAB

Subject Code: 3203

Practical:04

COURSE OBJECTIVES:

1. To understand and implement the basics of Natural Language Processing.
2. Learn and use different tools for NLP like NLTK.
3. To implement NLP task like Names Entity Recognition, Syntactic and Semantic analysis and Word Sense disambiguation.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Understand different building blocks of NLP.
2. Design algorithms for NLP problems.
3. Understand machine translation and its techniques.
4. Learn and use different tools for NLP.

Subject: ELECTIVE II BIG DATA ANALYTICS LAB

Subject Code: 3203

Practical:04

COURSE OBJECTIVES:

1. Optimize business decisions and create competitive advantage with Big Data analytics.
2. Imparting the architectural concepts of Hadoop and introducing map reduce paradigm.
3. Introducing Java concepts required for developing map reduce programs.
4. Derive business benefit from unstructured data.
5. Introduce programming tools PIG & HIVE in Hadoop ecosystem.
6. Developing Big Data applications for streaming data using Apache Spark.

COURSE OUTCOMES:

1. Preparing for data summarization, query, and analysis.
2. Applying data modelling techniques to large data sets.
3. Creating applications for Big Data analytics.
4. Building a complete business data analytic solution.

Subject: Machine Learning LAB

Subject Code: 3204

Practical:04

COURSE OBJECTIVES:

1. Understand the features of machine learning to apply on real world problems.
2. To extract patterns from data
3. To design and implement various machine learning algorithms and techniques using standard datasets.

COURSE OUTCOMES:

After completion of course, students would be able to:

1. Effectively use the various machine learning tools.
2. Understand and implement the procedures for machine learning algorithms.
3. Design Python programs for various machine learning algorithms.
4. Apply appropriate datasets to the Machine Learning algorithms.
5. Analyze the graphical outcomes of learning algorithms with specific datasets.

Subject: Research Paper III- Presentation / Publication

(Content: Technical communication for Research Paper Writing, Rubrics for evaluation)

Subject Code: 3205

Practical: 02

SEMESTER-IV

Subject: Project
Subject Code: 4101

Objectives:

To give the first-hand experience of analysis, design, implementation and documentation of relevant projects. Analysis of the existing system, Investigating alternatives, Design of a computer-based system Documentation, User training.

Subject:SWAYAM based MOOC Subject
Subject Code: 4102

Objectives:

To encourage students to self-learn, a course of interest to the students in Computer Science and Application, that must be completed in form of certification from Swayam. The Department will Approve the list of MOOC course at the beginning of the semester IV. The students will be required to submit the certificate and give a University External Exam of 100 marks.