An Autonomous Institute

Shree Warana Vibhag Shikshan Mandal's

**Tatyasaheb Kore Institute of Engineering And Technology, Warananagar**

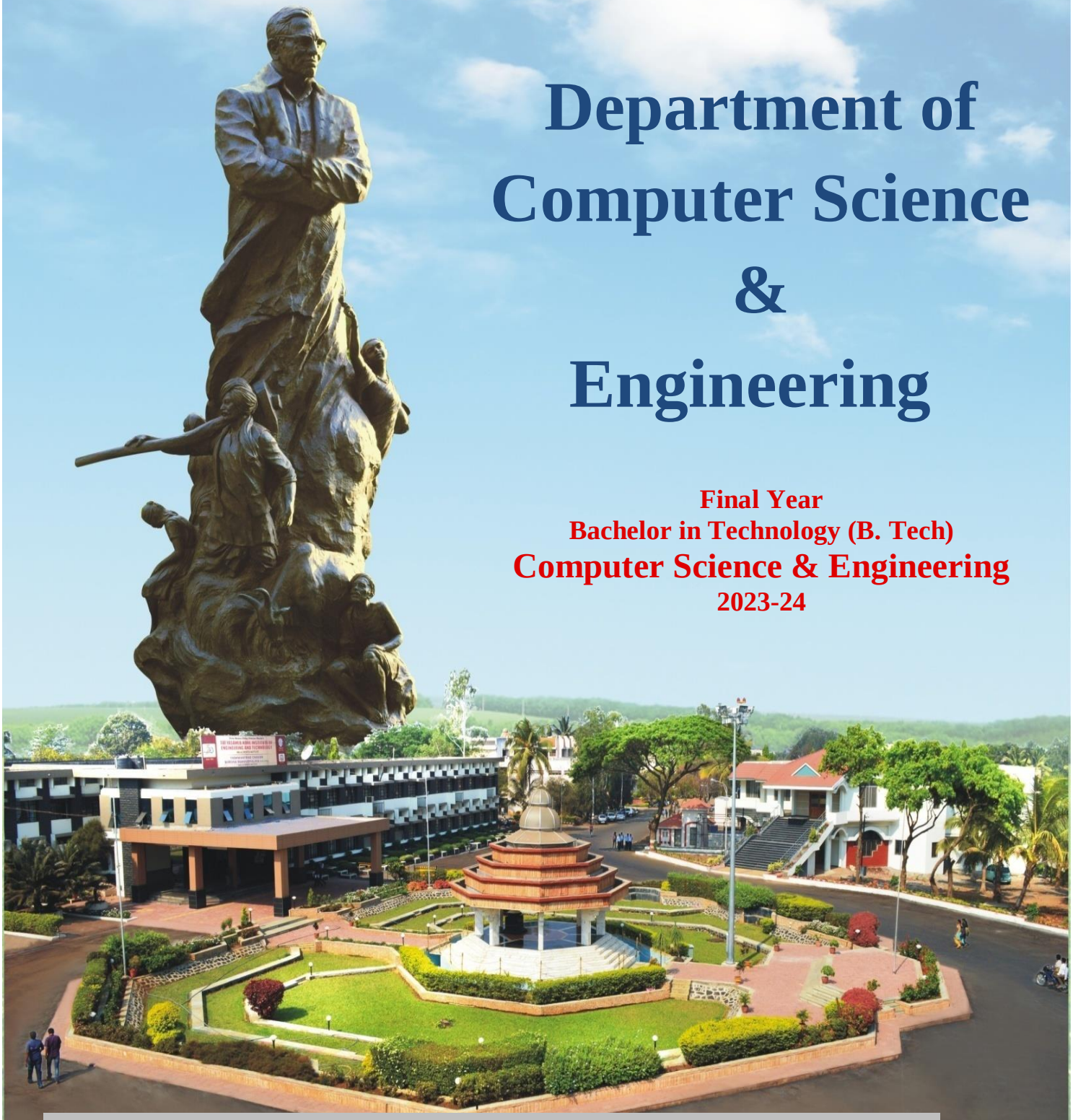
# Department of Computer Science & Engineering

**Final Year**

**Bachelor in Technology (B. Tech)**

**Computer Science & Engineering**

**2023-24**



## B. Tech. Computer Science & Engineering

**Syllabus Structure and Curriculum under Autonomy**

SWVSM'S

# Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

An Autonomous Institute

## Abbreviations

| Sr. No. | Acronym | Definition |
|---|---|---|
| 1 | ISE | In-Semester Examination |
| 2 | ISE-I | In-Semester Examination-I |
| 3 | ISE-II | In-Semester Examination-II |
| 4 | ESE | End-Semester Examination |
| 5 | ISA | In-Semester Assessment (Term Work) |
| 6 | L | Lecture |
| 7 | T | Tutorial |
| 8 | P | Practical |
| 9 | CH | Contact Hours |
| 10 | C | Credit |

## Course/ Subject Categories

| Sr. No. | Acronym | Definition |
|---|---|---|
| 1 | BSC | Basic Science Course |
| 2 | HSC | Humanity Science Course |
| 3 | ESC | Engineering Science Course |
| 4 | PCC | Professional Core Course |
| 5 | OEC | Open Elective Course |
| 6 | MC | Mandatory Course |
| 7 | PEC | Professional Elective Course |
| 8 | PW | Project Work (Mini and Major Project) |
| 9 | II | Industrial Internship |

### Course/ Subject Code

| C | S | E | 7 | 0 | 1 |
|---|---|---|---|---|---|
| Branch Code | | | Semester | Course Number | |

### Course Term work and POE Code

| C | S | E | 7 | 0 | 1 | T / P / A |
|---|---|---|---|---|---|---|
| Branch Code | | | Semester | Course Number | | T- Term work<br>P- POE<br>A- Audit Course<br>H- Honors' Course |

## Vision

To become center of excellence in the field of Computer Science and Engineering and develop competent IT technocrats

## Mission

- To develop engineering graduates with high degree of processional excellence
- To excel in academics and research through contemporary and real world problems
- To enhance graduate employability through work based learning in social entrepreneurship
- To encourage industrial and nationally recognized institutes collaboration
- To create an environment to nurture lifelong learning

## Program Educational Objectives (PEOs)

**Graduates will be,**

- Able to design and develop computing system using modern technologies by adapting business intelligence and challenges.
- Able to acquire capabilities with aptitude for higher education and entrepreneurship
- Able to function effectively as professionals having excellent interpersonal skills with ethical and social obligations.
- Able to work efficiently in multidisciplinary and multicultural environment
- Able to lead in their respective domain and contribute positively to the needs of society.

## Program Specific Outcomes (PEOs)

**Graduate will be able to**

- Identify, design and develop solution for real world problems by implementing phases of software development process model
- Analyze and apply the computer science engineering solutions in societal and human context
- Demonstrate the skills and knowledge of contemporary issues in the field of Computer science and Engineering

## Quality Policy

- To promote excellence in academic and training activities by inspiring students for becoming competent professionals to cater industrial and social needs.

## Program Outcomes (POs)

**The students after successfully completing this programme will have ability to:**

- **PO1: Engineering Knowledge**:
  Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

- **PO2: Problem Analysis**:
  Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

- **PO3: Design/Development of Solutions**:
  Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

- **PO4: Conduct Investigations of Complex Problems**:
  Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

- **PO5: Modern Tool Usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

- **PO6: The Engineer and Society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

- **PO7: Environment and Sustainability**:
  Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

- **PO8: Ethics**:
  Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

- **PO9: Individual and Team Work**:
  Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

- **PO10: Communication**:
  Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

- **PO11: Project Management and Finance**:
  Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

- **PO12: Life-long learning**:
  Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

SWVSM'S

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar

An Autonomous Institute

# Abbreviations

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| 1 | ISE | In-SemesterExamination |
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| 5 | ISA | In-Semester Assessment (Term Work) |
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| 7 | PEC | Professional Elective Course |
| 8 | PW | Project Work (Mini and Major Project) |
| 9 | II | Industrial Internship |

### Course/ Subject Code

| C | S | E | 3 | 0 | 1 |
|---|---|---|---|---|---|
| Branch Code | | | Semester | Course Number | |

### Course Term work and POE Code

| C | S | E | 3 | 0 | 1 | T/P / A |
|---|---|---|---|---|---|---|
| Branch Code | | | Semester | Course Number | | T- Term work<br>P- POE<br>A- Audit Course<br>H- Honours Course |

# Final Year B. Tech
# (Computer Science & Engineering)
# Semester VIII

Internship Track and Academic Track

Detailed Syllabus

SWVSM's

# Tatyasaheb Kore Institute of Engineering and Technology, Warananagar (Autonomous)

Final Year B.Tech (Computer Science & Engineering)

## Semester-VIII

## Final Year B.Tech (Internship Track)

(To be implemented from 2023 - 24)

Curriculum Structure, Credit Scheme and Evaluation Scheme

| Course Code | Category | Course Title | Teaching and Credit Scheme | | | | | Examination & Evaluation Scheme | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | CH | C | Scheme | Marks | Min for Passing |
| CSE801 | PCC | Project Management | 3 | - | - | 3 | 3 | ISE | 40 | 16 |
| | | | | | | | | ESE | 60 | 24 |
| CSE802 | PCC | Big Data Analytics | 3 | - | - | 3 | 3 | ISE | 40 | 16 |
| | | | | | | | | ESE | 60 | 24 |
| CSE802P | PCC | Big Data Analytics Lab | - | - | 2 | 2 | 1 | ISA (TW) | 50 | 20 |
| | | | | | | | | ESE (POE) | 50 | 20 |
| CSE803P | PCC | Mobile Application Development | 2 | - | 4 | 6 | 3 | ISA (TW) | 50 | 20 |
| | | | | | | | | ESE (POE) | 50 | 20 |
| CSE804P | PW | Project – II | - | - | 4 | 4 | 6 | ISA (TW) | 100 | 40 |
| | | | | | | | | ESE (OE) | 100 | 40 |
| CSE805I | PW | Industrial Internship | - | - | - | - | 4 | ISA (Inst.A)* | 100 | 40 |
| | | | | | | | | ISA (Ind.A)# | 100 | 40 |
| CSE810A | | Audit Course – VI<br>Extra Co-curricular Activity | -- | -- | -- | -- | -- | -- | | |
| **TOTAL** | | | **8** | **-** | **10** | **18** | **20** | -- | **800** | -- |

- ISE : In Semester Examination
- ESE : End Semester Examination
- ISA (Inst.A)* : In Semester Assessment (Institute Assessment)
- ISA (Ind.A)# : In Semester Assessment (Industry Assessment)

SWVSM's

# Tatyasaheb Kore Institute of Engineering and Technology, Warananagar (Autonomous)

Final Year B.Tech (Computer Science & Engineering)

## Semester-VIII

## Final Year B.Tech (Academic Track)

(To be implemented from 2023 - 24)

Curriculum Structure, Credit Scheme and Evaluation Scheme

| Course Code | Category | Course Title | Teaching and Credit Scheme | | | | | Examination & Evaluation Scheme | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | CH | C | Scheme | Marks | Min for Passing |
| CSE801 | PCC | Project Management | 3 | - | - | 3 | 3 | ISE | 40 | 16 |
| | | | | | | | | ESE | 60 | 24 |
| CSE802 | PCC | Big Data Analytics | 3 | - | - | 3 | 3 | ISE | 40 | 16 |
| | | | | | | | | ESE | 60 | 24 |
| CSE806 | PEC-II | Ad-hoc Wireless and Sensor Network | 2 | - | - | 2 | 2 | ISE | 40 | 16 |
| CSE807 | | Human Computer Interaction | | | | | | ESE | 60 | 24 |
| CSE808 | PEC-III | Natural Language Processing | 2 | - | - | 2 | 2 | ISE | 40 | 16 |
| CSE809 | | High Performance Computing | | | | | | ESE | 60 | 24 |
| CSE802P | PCC | Big Data Analytics Lab | - | - | 2 | 2 | 1 | ISA (TW) | 50 | 20 |
| | | | | | | | | ESE (POE) | 50 | 20 |
| CSE803P | PCC | Mobile Application Development | 2 | - | 4 | 6 | 3 | ISA (TW) | 50 | 20 |
| | | | | | | | | ESE (POE) | 50 | 20 |
| CSE804P | PW | Project – II | - | - | 4 | 4 | 6 | ISA (TW) | 100 | 40 |
| | | | | | | | | ESE (OE) | 100 | 40 |
| CSE810A | | Audit Course – VI<br>Extra Co-curricular Activity | -- | -- | -- | -- | -- | -- | | |
| **TOTAL** | | | **12** | **-** | **10** | **22** | **20** | -- | **800** | -- |

- ISE : In Semester Examination
- ESE : End Semester Examination
- ISA : In Semester Assessment

## CSE801 (PCC) - Project Management

Click for Syllabus Structure

| Teaching Scheme | | | Evaluation Scheme | | |
|---|---|---|---|---|---|
| **Lectures** | **:** | 3 Hrs/Week | **ISE** | **:** | 40 Marks |
| **Credits** | **:** | 3 | **ESE** | **:** | 60 Marks |

| **Course Objective:** The objective of this course is to | |
|---|---|
| **1** | To provide students with a basic understanding of project management principles and practices |
| **2** | To demonstrate competency in the creation and management of a project plan |
| **3** | To understanding impact of Scope, Time and Cost management. |
| **4** | To understanding the software quality metrics and quality assurance |
| **5** | To develop strategies to calculate risk factors involved in IT projects |

| **Course Outcomes:** | | |
|---|---|---|
| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
| **CO1** | Link projects with organization's strategic plans, documenting the business needs and justifications for the project | Understand |
| **CO2** | Implement the PMI project management knowledge areas, processes, lifecycle phases and the embodied concepts, tools and techniques | Apply |
| **CO3** | Define and manage the overall scope, time, cost and quality of the project, documenting project goals, deliverables, constraints, performance criteria and resource requirements | Remember, Analyse |
| **CO4** | Determine project control procedures in human resource management, change management, and risk management plans | Evaluate |
| **CO5** | Develop, implement, and analyse Scrum, Agile Manifesto and principles. | Create |

**Course Description:**

Project management involves the planning and organization of a company's resources to move a specific task, event, or duty towards completion.

| **Prerequisites :** | **1** | **Software Engineering** |
|---|---|---|

**Section – I**

| | | |
|---|---|---|
| **Unit-1** | **Introduction to Project Management**<br>Project and Project Management (PM), Role of project Manager, System view of PM, Organization, Stakeholders, Project phases and lifecycle, Context of IT projects, process groups, mapping groups to Knowledge areas. | **06 Hours** |
| **Unit-2** | **Project Integration Management:**<br>Strategic planning and project selection, developing a Project Management Plan, Directing and Managing Project Work, Monitoring and Controlling Project Work, Performing Integrated Change Control, Closing Projects or Phases | **06 Hours** |
| **Unit-3** | **Project Scope, Time and Cost management:**<br>Planning Scope Management, Collecting Requirements, Defining Scope, Creating the Work Breakdown Structure, Validating Scope, Controlling | **06 Hours** |

| | | |
|---|---|---|
| | Scope<br>Planning Schedule Management, Defining Activities, Sequencing and Estimating Activity, Resources & Duration, Developing & Controlling Schedule<br>Basic Principles of Cost Management, Planning Cost Management, Estimating Costs, Determining the Budget, Controlling Costs | |
| **Section – II** | | |
| **Unit-4** | **Quality and Human Resource Management:**<br>Importance, Planning Quality Management, Performing Quality Assurance, Controlling Quality, Tools and Techniques for Quality Control,<br>**Human Resource management**: Importance, keys to managing people, human resource planning, acquiring, developing and managing project team. | **06 Hours** |
| **Unit-5** | **Risk management:**<br>Importance, risk management planning, sources of risk, risk identification, qualitative and quantitative risk analysis, risk response planning, risk monitoring and control. | **05 Hours** |
| **Unit-6** | **Agile Project Management:**<br>The Genesis of Agile, Introduction and background, Agile Manifesto and Principles, Overview of Scrum, Extreme Programming, Feature Driven development, Lean Software Development, Agile project management, Design and development practices in Agile projects | **04 Hours** |

**Mapping of POs & COs:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 2 | -- | 1 | 1 | -- | -- | -- | -- | -- | -- | 1 |
| **CO2** | 3 | 2 | -- | 1 | -- | -- | -- | -- | -- | -- | -- | 1 |
| **CO3** | 3 | 1 | 1 | -- | -- | -- | -- | -- | -- | -- | 2 | -- |
| **CO4** | 3 | -- | -- | 1 | -- | 2 | -- | -- | -- | -- | -- | -- |
| **CO5** | 2 | -- | -- | -- | -- | -- | -- | -- | 1 | -- | 2 | 1 |

| **References** | |
|---|---|
| **Text Books :** | |
| 1 | Information Technology Project Management, Kathy Schwalbe, Cengage Learning 7E(For Units1 to 5) |
| 2 | Software Project Management, Bob Huges, Mike Cotterell, Rajib Mall, McGraw Hill Edu (For Unit 6) |
| **Reference Books:** | |
| 1 | Effective Project Management, Robert K.Wysocki, Wiley India 7 Edition |
| 2 | Project Management Core Textbook, Mantel Jr., Meredith, Shafer, Sutton, Gopalan, Wiley India Edition |
| 3 | IT Project Management, IT Project Management, McGraw Hill Edu. |
| **SWAYAM Courses** (Operational Timestamp: Saturday,27-May-2023 on 3:45PM) | |
| 1 | **Project Management** By Prof. Raghu Nandan Sengupta \| IIT Kanpur<br>https://onlinecourses.nptel.ac.in/noc19_mg30/preview |

## CSE802 (PCC) -Big Data Analytics

Click for Syllabus Structure

| Teaching Scheme | | | Evaluation Scheme | | |
|---|---|---|---|---|---|
| **Lectures** | **:** | 3 Hrs/Week | **ISE** | **:** | 40 Marks |
| **Credits** | **:** | 3 | | | |
| **Tutorials** | **:** | -- | **ESE** | **:** | 60 Marks |

| **Course Objective:** The objective of this course is to | |
|---|---|
| **1** | Understand the Big Data and its analytics. |
| **2** | Provide an overview of Apache Hadoop |
| **3** | Apply analytics on Structured and Unstructured Data. |
| **4** | Exposure to Data Analytics with R. |

| **Course Outcomes:** | | |
|---|---|---|
| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
| **CO1** | Understand Big Data and its Analytics in real world. | Understand |
| **CO2** | Analyze the Big Data framework to efficiently store and process Big Data to generate analytics. | Analyze |
| **CO3** | Apply tools and techniques to analyse Big Data. | Apply |
| **CO4** | Develop the Big Data Solutions using Hadoop and R. | Create |

**Course Description :**

This course gives an overview of Big Data Analytics. In addition, it also focuses on the technologies that are available for storage, processing of Big Data such as Hadoop and R. It also helps a student to perform a variety of analytics on different data sets and to arrive at positive conclusions.

| **Prerequisites :** | | |
|---|---|---|
| | **1** | Database Engineering |
| | **2** | Computer Networks |

| **Section – I** | | |
|---|---|---|
| **Unit-1** | **Getting an Overview of Big Data**<br>What is Big Data?, Evolution of Big Data, Elements of Big Data, Big Data Analytics, Careers in Big Data | **05 Hours** |
| **Unit-2** | **Technologies for Handling Big Data**<br>Distributed and Parallel Computing for Big Data, Introducing Hadoop, Hadoop Ecosystem, Hadoop Distributed File System, MapReduce, Hadoop YARN, Hbase, Hive, Pig and Pig Latin, Sqoop, Zookeeper, Flume, Oozie | **06 Hours** |
| **Unit-3** | **Understanding Hadoop MapReduce and YARN Fundamentals**<br>The MapReduce Framework, Techniques to Optimize MapReduce Jobs, Use of MapReduce, Background of YARN, Advantages of YARN, YARN Architecture, Working of YARN, YARN Scheduler | **05 Hours** |
| **Section – II** | | |
| **Unit-4** | **Exploring Hive and Pig**<br>Introducing Hive, Hive Services, Data Types in Hive, Built Functions in Hive, Hive DDL, Data Manipulation in Hive, Data Retrieval Queries, | **08 Hours** |

| | | |
|---|---|---|
| | Introducing Pig, Running Pig, Getting Started with Pig Latin, Working with Operators in Pig | |
| **Unit-5** | **Understanding Analytics, Analytical Approaches and Tools to Analyze Data**<br>Comparing Reporting and Analytics, Type of Analytics, Analytical Approaches, History of Analytical Tools, Introducing Popular Analytical Tools, Comparing Various Analytical Tools | **06 Hours** |
| **Unit-6** | **Understanding R Fundamentals**<br>Exploring R, Reading datasets and exporting data from R, Manipulating and processing data in R. | **06 Hours** |

**Mapping of POs & COs:**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| **CO2** | 3 | 3 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| **CO3** | 3 | 2 | 2 | 3 | 3 | 1 | 0 | 0 | 1 | 0 | 1 | 2 |
| **CO4** | 3 | 2 | 3 | 1 | 1 | 2 | 1 | 0 | 2 | 1 | 2 | 2 |

| **References** | |
|---|---|
| **Text Books :** | |
| 1 | Big Data (Black Book)- DT Editorial Services- Dreamtech Press (Units 1 to 6) |
| **Reference Books :** | |
| 1 | Big Data and Analytics- Seema Acharya and SubhashiniChellappan- Wiley Publications. |
| 2 | Big Data Analytics with R and Hadoop- VigneshPrajapati- Packt Publishing 2013 |
| 3 | Hadoop: The Definitive Guide, Tom White- O'reilly, 2012 |
| **SWAYAM Courses** | |
| **1** | NPTEL Course on Big Data Computing<br>https://nptel.ac.in/courses/106104189 |

## CSE806 (PEC-II) - Ad-hoc Wireless and Sensor Networks

Click for Syllabus Structure

| Teaching Scheme | | | Evaluation Scheme | | |
|---|---|---|---|---|---|
| **Lectures** | **:** | 2 Hrs/Week | **ISE** | **:** | 40 Marks |
| **Credits** | **:** | 2 | **ESE** | **:** | 60 Marks |

| **Course Objective :** The objective of this course is to | |
|---|---|
| **1** | To understand cellular, wired and Ad Hoc wireless networks |
| **2** | To understand mechanism of routing protocols in Ad Hoc wireless networks |
| **3** | To introduce Transport layer and security protocols for ad hoc wireless networks |
| **4** | To introduce sensor networks and its routing algorithms |
| **5** | To introduce sensor networks infrastructure and sensor tasking |

| **Course Outcomes :** | | |
|---|---|---|
| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
| **CO1** | Describe issues and design goals in Ad Hoc wireless networks | Understand |
| **CO2** | Explain and classify various routing protocols in Ad Hoc wireless networks | Remember |
| **CO3** | Describe design issues and classify transport layer protocols and security protocols in Ad Hoc wireless networks | Understand |
| **CO4** | Describe challenges and routing protocols in sensor networks | Understand |
| **CO5** | Explain sensor networks infrastructure management and sensor tasking and control techniques | Remember |

**Course Description :**

This course deals with various design issues considered during the design and deployment of ad hoc networks and understanding basics of sensors technology and sensor networks.

| **Prerequisites :** | | |
|---|---|---|
| | **1** | Basics of Data Communication |
| | **2** | Fundamentals of Computer Networks and Internet |

**Section – I**

| | | |
|---|---|---|
| **Unit-1** | **Introduction**<br>Cellular and Ad Hoc wireless networks, Applications, Issues in Ad Hoc wireless networks, MAC Protocols for ad hoc wireless networks – Introduction, Issues in designing MAC protocol, Design goals of MAC protocol, Classification of MAC protocols, Contention based protocols. | **05 Hours** |
| **Unit-2** | **Routing protocols for ad hoc wireless networks**<br>Introduction, Issues in designing a routing protocol for ad hoc wireless networks, Classification of routing protocols, Table driven, on-demand Hybrid routing protocols, Issues in designing a multicast routing protocol. Operation of multicast routing protocols, An architecture reference model for multicast routing protocols, Classification of multicast routing protocols | **04 Hours** |
| **Unit-3** | **Transport layer and security protocols for ad hoc wireless networks**<br>Introduction, Design issues and goals, Classification of transport layer | **03 Hours** |

| | | |
|---|---|---|
| | solutions, TCP over ad hoc wireless networks, Security in ad hoc wireless networks, Network security requirements, Issues and challenges in security provisioning, Network security attacks, Key management, Secure routing | |
| **Section – II** | | |
| **Unit-4** | **Introduction to Sensor Networks and Routing Algorithms**<br>Unique Constraints and Challenges , Advantages of Sensor Networks, Sensor Network Applications, Medium Access Control , The S-MAC Protocol , IEEE 802.15.Standard and ZigBee: General Issues , Geographic, Energy-Aware Routing , Unicast Geographic Routing , Routing on a Curve , Energy-Minimizing Broadcast , Energy-Aware Routing to a Region , Attribute-Based Routing , Directed Diffusion , Rumor Routing , Geographic Hash Tables | **05 Hours** |
| **Unit-5** | **Sensor Network Infrastructure Establishment**<br>Topology Control , Clustering , Time Synchronization , Clocks and Communication Delays, Interval Methods, Reference Broadcasts, Localization and Localization Services, Ranging Techniques , Range-Based Localization Algorithms, Other Localization Algorithms , Location Services. | **04 Hours** |
| **Unit-6** | **Sensor Tasking and Control**<br>Task-Driven Sensing , Roles of Sensor Nodes and Utilities , Information-Based Sensor Tasking , Sensor selection , Joint Routing and Information Aggregation, Moving center of aggregation , Multi-step information-directed routing , Sensor group management | **04 Hours** |

**Mapping of POs & COs:**

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

| **References** | |
|---|---|
| **Text Books :** | |
| 1 | Ad Hoc wireless Networks – Architecture and Protocols by C.S.R.Murthy& B.S. Manoj, Pearson Education |
| 2 | Feng Zhao and Leonides Guibas, "Wireless sensor networks ", Elsevier publication, 2004 |
| **Reference Books :** | |
| 1 | Ad Hoc Wireless Networks – A communication Theoretic perspective by O.K.Tonguz & G.Ferrari, Wiley India |

| | |
|---|---|
| 2 | Ad Hoc Mobile Wireless Networks – Protocols and Systems by C. K. Toh (Pearson Education) |
| 3 | Ad Hoc Networking by Charles E. Perkins (Pearson Education) |
| 4 | William Stallings, "Wireless Communications and Networks ", Pearson Education – 2004 |
| 5 | Introduction to Wireless and Mobile Systems, 2nd Edition, by Dharma Prakash Agrawal & Qing-An Zeng (CENGAGE Learning) |
| **SWAYAM Courses** (Operational Timestamp: Fri,07-Jul-2023 on 7:00 AM) | |
| 1 | https://archive.nptel.ac.in/courses/106/105/106105160/ [IIT, Kharagpur] |

## CSE807 (PEC-II) - Human Computer Interaction

Click for Syllabus Structure

| Teaching Scheme | | | Evaluation Scheme | | |
|---|---|---|---|---|---|
| **Lectures** | **:** | 2 Hrs/Week | **ISE** | **:** | 40 Marks |
| **Credits** | **:** | 2 | **ESE** | **:** | 60 Marks |

| **Course Objective:** The objective of this course is to | |
|---|---|
| **1** | Give insight of basic concepts of human computer interaction |
| **2** | Introduce students to theories and principles in computer interface design |
| **3** | Develop students' ability to design, conduct and analyse user studies for computer software |
| **4** | Provide students with the knowledge of the design process for user interface |

| **Course Outcomes:** | | |
|---|---|---|
| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
| **CO1** | Explain design principals of HCI | Understand |
| **CO2** | Develop web and software UI using HCI design principles | Apply |
| **CO3** | Differentiate between different HCI design techniques and use appropriate HCI design technique for given problem | Analyse |

**Course Description :**

Human-Computer Interaction (HCI) will give you the skills to properly understand, and design, the relationship between the "humans", on one side, and the "computers" (websites, apps, products, services, etc.), on the other side.

| **Prerequisites :** | | |
|---|---|---|
| | **1** | Software Engineering |
| | **2** | Web Technology |

**Section – I**

| | | |
|---|---|---|
| **Unit-1** | **Introduction**<br>Introduction of HCI, Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design. The graphical user interface Web user Interface Principles of user interface. Principal of user interface design | **04 Hours** |
| **Unit-2** | **Design of HCI Systems**<br>Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, Screen Designing: Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design. | **05 Hours** |
| **Unit-3** | **Evaluation Techniques**<br>Definition and goals of evaluation, evaluation through expert analysis and user participation, choosing an evaluation method, universal design principles, multi-model interaction, designing for diversity, user support | **04 Hours** |

| Section – II | | |
|---|---|---|
| **Unit-4** | **Cognitive methods**<br>HCI in the software process, The software life cycle Usability engineering Iterative design and prototyping Design Goal and task hierarchies, Linguistic models, challenges of display-based systems, physical and device models, cognitive architectures | **05 Hours** |
| **Unit-5** | **Communications and collaborations models**<br>Face to Face communication, conversations, Text based communication, group working task analysis-difference, decomposition, knowledge based techniques, use of task analysis | **04 Hours** |
| **Unit-6** | **Next Generation HCI**<br>Introduction to Emergent paradigms: Groupware systems, Ubiquitous computing, Virtual & Augmented Reality, Affective computing, Context aware interfaces Introduction to incorporating Design Thinking in HCI design practices. Case Studies | **04 Hours** |

**Mapping of POs & COs:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 1 | 1 | - | - | - | - | - | - | - | - | 1 |
| **CO2** | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 1 |
| **CO3** | 2 | 2 | 3 | - | 2 | - | - | - | - | - | - | 1 |

| **Text Books :** | |
|---|---|
| 1 | The essential guide to user interface design, Wilbert O Galitz, Wiley Dream Tech. |
| 2 | "Human-Computer Interaction 3/E", Dix, Prentice Hall. |
| 3 | Human – Computer Interaction. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg,Pearson Education |
| **Reference Books :** | |
| 1 | John M Carroll, “Human Computer Interaction in the New Millennium”, Pearson Education, 2001 |
| 2 | S. Sahni “Smart Things: Ubiquitous Computing User Experience Design, Mike Kuniavsky". |
| 3 | Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia |
| 4 | "Designing for the Digital Age: How to Create Human-Centered Products and Services", Kim Goodwin and Alan Cooper. |
| **SWAYAM Courses** (Operational Timestamp: Sat,16-Jul-2022 on 7:00 AM) | |
| **1** | https://archive.nptel.ac.in/courses/106/103/106103115/ |

## CSE808 (PEC-III) - Natural Language Processing

Click for Syllabus Structure

| Teaching Scheme | | | Evaluation Scheme | | |
|---|---|---|---|---|---|
| **Lectures** | **:** | 2 Hrs/Week | **ISE** | **:** | 40 Marks |
| **Credits** | **:** | 2 | **ESE** | **:** | 60 Marks |

| **Course Objective :** The objective of this course is to | |
|---|---|
| **1** | To introduce the fundamental concepts and techniques of Natural language Processing for analyzing words based on Morphology and CORPUS. |
| **2** | To examine the NLP models and interpret algorithms for classification of NLP sentences byusing both the traditional, symbolic and the more recent statistical approach. |
| **3** | To get acquainted with the algorithmic description of the main language levels that includesmorphology, syntax, semantics, and pragmatics for information retrieval and machine translation applications. |
| | |

| **Course Outcomes :** | | |
|---|---|---|
| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
| **CO1** | Illustrate language modelling technique based on the structure of the language. | Remember |
| **CO2** | Understand the principles and Process the Human Languages. | Understand |
| **CO3** | Explain CORPUS linguistics based on digestive approach. | Analyse |
| **CO4** | Demonstrate understanding of algorithms and techniques for text-based processing of natural language with respect to morphology. | Apply |

| **Course Description :** | | |
|---|---|---|
| Natural language processing (NLP) is a machine learning technology that gives computers the ability to interpret, manipulate, and comprehend human language. | | |
| **Prerequisites :** | **1** | Machine Learning |
| | **2** | Deep Learning |
| | **3** | Computer Algorithms |

| **Section – I** | | |
|---|---|---|
| **Unit-1** | **Introduction To NLP**<br>Introduction to various levels of natural language processing, Ambiguities and computational challenges in processing various natural languages. Introduction to Real life applications of NLP such as spell and grammar checkers, information extraction, question answering, and machine translation. | **05 Hours** |
| **Unit-2** | **Text Processing**<br>Character Encoding, Word Segmentation, Sentence Segmentation, Introduction to Corpora, Corpora Analysis. | **04 Hours** |
| **Unit-3** | **Morphology**<br>Inflectional and Derivation Morphology, Morphological Analysis and | **04 Hours** |

| | | |
|---|---|---|
| | Generation using finite statetransducers. | |
| **Section – II** | | |
| **Unit-4** | **Lexical Syntax**<br>Introduction to word types, POS Tagging, Maximum Entropy Models for POS tagging, Multi-word Expressions. | **04 Hours** |
| **Unit-5** | **Language Modeling**<br>The role of language models. Simple N-gram models. Estimating parameters and smoothing.Evaluating language models. | **04 Hours** |
| **Unit-6** | **Syntax & Semantics**<br>Introduction to phrases, clauses and sentence structure, Shallow Parsing and Chunking, Shallow Parsing with Conditional Random Fields (CRF), Lexical Semantics, Word Sense Disambiguation, WordNet, Thematic Roles, Semantic Role Labelling with CRFs. Applications of NLP | **05 Hours** |

**Mapping of POs & COs:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 3 | 1 | - | - | - | - | - | - | - | - | 2 |
| **CO2** | 2 | 3 | 2 | - | - | - | - | - | - | - | - | 1 |
| **CO3** | 1 | 3 | 1 | - | 1 | - | - | - | - | - | - | |
| **CO4** | 2 | 2 | 3 | - | 1 | - | - | - | - | - | - | 1 |

| **References** | |
|---|---|
| **Text Books :** | |
| 1 | Speech and Language Processing- Daniel Jurafsky and James H Martin -2E, Pearson Education, 2009 |
| **Reference Books :** | |
| 1 | Chris Manning and HinrichSchütze, "Foundations of Statistical Natural LanguageProcessing", 2nd edition, MITPress Cambridge, MA, 2003. |
| 2 | NitinIndurkhya, Fred J. Damerau "Handbook of Natural Language Processing", SecondEdition, CRC Press, 2010. |
| 3 | James Allen "Natural Language Understanding", Pearson Publication 8th Edition. 2012. |
| **SWAYAM Courses** (Operational Timestamp: Mon,24-Jul-2023 on 7:00 AM) | |
| **1** | https://onlinecourses.nptel.ac.in/noc23_cs80/preview |

## CSE809 (PEC-III) - High Performance Computing

Click for Syllabus Structure

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| **Lectures** | : 2 Hrs/Week | **ISE** | : 40 Marks |
| **Credits** | : 2 | **ESE** | : 60 Marks |

| **Course Objective :** The objective of this course is to | |
|---|---|
| **1** | To introduce the current trends in computer architecture and programming model. |
| **2** | To understand shared memory and distributed architecture and programming. |
| **3** | To develop effective parallel programs using MPI, Pthreads and OpenMP. |

| **Course Outcomes :** | | |
|---|---|---|
| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
| **CO1** | Understanding principles of Distributed and shared memory programming. | Understand |
| **CO2** | Design and development of parallel programs by exploiting parallel programming patterns and measure their performance | Design |
| **CO3** | Implement the concepts of MPI, and OpenMP for Distributed and pthread for shared memory programming. | Apply |
| **CO4** | Solve the communication and coordination issues in parallel programming | Apply |

**Course Description :**

This course gives the knowledge of computer architecture and parallel computing. In addition, it also focuses on high performance computing using MPI for distributed memory programming and OPEN MP, PTHREAD for shared memory programming.

| **Prerequisites :** | | |
|---|---|---|
| | **1** | Advanced Computer Architecture |
| | **2** | Operating System |
| | **3** | Computer Organization and Microcontroller |
| | **4** | Digital System and Microprocessor |

**Section – I**

| | | |
|---|---|---|
| **Unit-1** | **Parallel Computing**<br>Need of Ever-Increasing Performance, Building Parallel Systems, Need To write parallel program, How to Write Parallel Programs, Concurrent, Parallel, Distributed. | **04 Hours** |
| **Unit-2** | **Parallel Hardware and Parallel Software**:<br>**Modifications to the von Neumann Model:** Basics of Caching, Cache mappings, caches and programs, Virtual memory, Instruction Level Parallelism, Hardware multithreading. **Parallel Hardware:** Interconnection Network, Cache coherence, **Parallel Software:** Caveats, Coordinating the processes/threads, Shared-memory, Distributed-memory, Programming hybrid systems, **Input and Output**, **Performance:** Speedup and efficiency, Amdahl's law, Scalability, Taking timings, **Parallel Program Design:** An example | **08 Hours** |

| | | |
|---|---|---|
| **Unit-3** | **Distributed-Memory Programming with MPI**<br>**Getting started:** Compilation and execution, MPI programs, SPMD programs, Communication, Message matching, Status argument, semantics of MPI_send and MPI_recv , Trapezoidal Rule in MPI, **Dealing with I/O:** Output, Input, **Collective Communication:** Tree-structured communication, MPI_Reduce, Collective vs. point-to-point communications, MPI_Allreduce, Broadcast, Data distributions, MPI Derived Datatypes, **Performance Evaluation of MPI Programs:** Taking timings, Results, Speedup and efficiency, Scalability . | **06 Hours** |
| **Section – II** | | |
| **Unit-4** | **Shared-Memory Programming with Pthreads**<br>Processes, Threads, and Pthreads, Hello World, Matrix-Vector Multiplication , Critical Sections, Busy-Waiting, Mutexes, | **04 Hours** |
| **Unit 5** | **Synchronization and Cache Coherence in Shared-Memory Programming**<br>Producer consumer synchronization and semaphores, Barriers and Condition Variables, Read-Write Locks, Caches, Cache coherence and False sharing, Thread safety | **03 Hours** |
| **Unit-6** | **Shared-Memory Programming with OpenMP**<br>Getting Started: Compiling and running OpenMP programs, The program, Error Checking, The Trapezoidal Rule , Scope of variables, The reduction clause ,The parallel for Directive, More about loops in OpenMP , Scheduling Loops, Producer and consumers | **04 Hours** |

**Mapping of POs & COs:**

| PO<br>CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 1 | 1 | - | - | - | - | - | - | - | - | 2 |
| **CO2** | 3 | 2 | 3 | 2 | - | 1 | - | - | 1 | 1 | 1 | 2 |
| **CO3** | 3 | 2 | 2 | 1 | 2 | - | - | - | 1 | - | - | 2 |
| **CO4** | 3 | 2 | 2 | 2 | | - | - | - | - | - | - | 1 |

| **References** | |
|---|---|
| **Text Books :** | |
| 1 | An Introduction to Parallel Programming by Peter S. Pacheco, Elsevier, 2011. |
| **Reference Books :** | |
| 1. | Parallel computing theory and practice by Michel J. Quinn by TMH |
| 2. | Computer Architecture & Parallel Processing by Kai Hwang & Briggs, McGraw Hill |
| 3. | Parallel and Distributed Systems by Arun Kulkarni, Napur Prasad Giri, Wiley Publications, 2nd Edition |
| **SWAYAM Courses** | |

| | |
|---|---|
| 1. | NPTEL Course on High Performance Computing for Scientists and Engineers<br>https://nptel.ac.in/courses/112105293 |
| 2 | Introduction to parallel programming with OpenMP and MPI<br>https://onlinecourses.nptel.ac.in/noc23_cs28/preview |

## CSE802P (PCC) - Big Data Analytics Lab

Click for Syllabus Structure

**Teaching Scheme**

**Practical** : 2 Hrs/Week

**Credits** : 1

**Evaluation Scheme**

**ISA** : 50 Marks

**ESE(POE)** : 50 Marks

| Sr. No. | Experiment | Bloom's Taxonomy |
|---|---|---|
| 1 | Installation of Hadoop. | Understand |
| 2 | Implementation of HDFS Commands, Hadoop YARN Administration commands and User commands. | Understand |
| 3 | Building Hadoop MapReduce application for counting frequency of word/phrase in simple text file. | Analysis |
| 4 | Handling the Database using Hadoop Hive DDL commands, like create database, Viewing database, Dropping database, Altering database, creating tables, Dropping and altering tables. | Apply |
| 5 | Handling the Database using Hadoop Hive DML commands like Insert, delete, update, data retrieval queries and Join-inner and outer. | Apply |
| 6 | Working with operators in Apache Pig- FOREACH, ASSERT, FILTER, GROUP, ORDER BY, DISTINCT, JOIN, LIMIT, SAMPE, SPLIT, FLATIEN. | Apply |
| 7 | Installation of R Studio and implementation of basic concepts in R. | Understand |
| 8 | Working with R with data sets- create, read, write and R Tables- create, read, write. | Understand |
| 9 | Manipulating and processing data in R- merging datasets, sorting data, putting data into shape, managing data using matrices managing data using data frames. | Understand |
| 10 | Text Mining using R and Hadoop. | Analysis |

## CSE807P-Mobile Application Development

Click for Syllabus Structure

| Teaching Scheme | | | Evaluation Scheme | | |
|---|---|---|---|---|---|
| **Lectures** | **:** | 2 Hrs/Week | **ISE** | **:** | 50 Marks |
| **Practical** | **:** | 4 Hrs/Week | **ESE(POE)** | **:** | 50 Marks |
| **Credits** | **:** | 3 | | | |

| **Course Objective:** The objective of this course is to | |
|---|---|
| **1** | To describe android architecture and the tools for developing android Applications |
| **2** | To create an android application |
| **3** | To design the user interfaces used in android applications |
| **4** | To deploy android application on app market |

| **Course Outcomes:** | | |
|---|---|---|
| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
| **CO1** | To Install and configure Android application development tools | Remember |
| **CO2** | To Design and develop user Interfaces for the Android application | Create |
| **CO3** | To Design and develop database based android application using SQLite | Create |
| **CO4** | To explore publishing app in android market | Analyse |
| **CO5** | To Apply Java programming concepts in application development | Apply |

**Course Description :**

This course is concerned with the development of applications on mobile and wireless computing platforms. Android will be used as a basis for teaching programming techniques and design patterns related to the development of standalone applications and mobile portals to enterprise and ecommerce systems. Emphasis is placed on the processes, tools and frameworks required to develop applications for current and emerging mobile computing devices. Students will work at all stages of the software development life-cycle from inception through to implementation and testing. In doing so, students will be required to consider the impact of user characteristics, device capabilities, networking infrastructure and deployment environment, in order to develop software capable of meeting the requirements of stakeholders.

| **Prerequisites :** | | |
|---|---|---|
| | **1** | Java |
| | **2** | XML |
| | **3** | SQL |

**Section – I**

| | | |
|---|---|---|
| **Unit-1** | **Android Overview**<br>Overview of Android, History, Android Versions, Android OS stack: Linux kernel, Native Libraries/DVM, Application Framework, Applications, Activity, Activity lifecycle, Fragments, Activity Back Stack, Process and Threads. **Android Development Environment:** Introduction to Android SDK, Android Emulator, Creating a Project, Project Directory Structure, DDMS, Logging in Android (Logcat), Android Manifest File, Permissions | **08 Hours** |
| **Unit-2** | **Intents and Layouts**<br>XML, Android View Hierarchies, Linear Layouts, Relative Layout, Table Layout, Frame LayoutSliding, Using Padding and Margins with Layouts. What Is Intent? Android Intent Messaging | **0[illegible] Hours** |

| | | |
|---|---|---|
| | via Intent Objects, Types of Intents, Using Intents with Activities, Sending Intents (Telephony,SMS), Broadcast Receivers | |
| **Unit-3** | **Input Controls, Input Events, Dialogs**<br>Buttons, Text Fields, Checkboxes, Radio Buttons, Toggle Buttons, Spinners, Event Listeners, Event Handlers, Touch Mode, Handling Focus, Dialogs: Alerts, Pop ups, Toasts | **04 Hours** |
| **Section – II** | | |
| **Unit-4** | **Menus, Notification and Action Bar**<br>Menus, Options menu, Context menu, Popup menu, Handling menu click events, creating a Notification, Notification actions, Notification priority, Managing Notifications, Removing notifications | **04 Hours** |
| **Unit-5** | **Android Database and App Market**<br>Installing SQLite plugin, DbHelper, The Database Schema and Its Creation, Four Major Operations, Cursors, Example, publish app to the Android Market | **04 Hours** |
| **Unit-6** | **Using Common Android APIs**<br>Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs. | **04 Hours** |

**Mapping of POs & COs:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 1 | - | - | - | 1 | - | - | - | - | - | - | 1 |
| **CO2** | 3 | 1 | 3 | 1 | - | - | - | - | 1 | 1 | - | 2 |
| **CO3** | 3 | 1 | 3 | 1 | - | - | - | 1 | 1 | 1 | - | 1 |
| **CO4** | 1 | - | - | - | 1 | 2 | - | 2 | 1 | 1 | 2 | 1 |
| **CO5** | 3 | 2 | 3 | 2 | - | 1 | - | 1 | 2 | 2 | 1 | 3 |

| **References** | |
|---|---|
| **Text Books :** | |
| 1 | Head First Android Development 2nd Edition by Dawn Griffiths, David Griffiths Publisher(s): O'Reilly Media, Inc. |
| 2 | Beginning Android application development by Wei-Mag Lee Wrox Publication |
| 3 | Learning Android by Marko GargentaW. Jason Gilmore published by O'Reilly Media |
| 4 | Android Apps for Absolute Beginners by Wallace Jackson published by Appress |
| **Reference Books :** | |
| 1 | Android in Action by W.FrankAbleson, Robi Sen, Chris King, C. Enrique Ortiz |
| 2 | The Android Developer's Cook book "Building Applications with the Android SDK byJames Steele |
| 3 | Beginning Android by Mark L Murphy published by Wiley India Pvt Ltd |
| 4 | Android Application Development All in one for Dummies by Barry Burd |
| **SWAYAM Courses** (Operational Timestamp: Sat,16-Jul-2022 on 7:00 AM) | |

| | |
|---|---|
| **1** | Android Mobile Application Development - Course (swayam2.ac.in) |
| **2** | Introducing the Android Developer Nanodegree \| Udacity |
| **3** | Android App Development \| Coursera |
| **4** | Web Resources<br>1. Training Courses \| Android Developers |

| **Term Work & Tutorial** | |
|---|---|
| **1** | Minimum of 10 Experiments to be performed from the list given below |
| **2** | 25 marks for performance in practical and experiments as part of continuous evaluation |
| **3** | 25 marks for Performance and oral to be conducted |

**List of Experiment**

| Sr. No. | Experiment | Bloom's Taxonomy |
|---|---|---|
| 1 | Simple Arithmetic App | Apply |
| 2 | Use of Fragments in App | Apply |
| 3 | Write a program to use of different layouts | Apply |
| 4 | Write a program to study Intents for switching between activities | Understand |
| 5 | Write a program to use of Intents for SMS and Telephony | Remember and Apply |
| 6 | Program to demonstrate Spinners, Touch Mode, Alerts, Popups, Menus and Toasts with their events handler. | Understand and Apply |
| 7 | Program to demonstrate notification with their action. | Analyse and Apply |
| 8 | Implement an application that writes data to the SD card. | Apply |
| 9 | Write a mobile application that creates alarm clock. | Analyse and Apply |
| 10 | Write a program to study and use of SQLite database. | Remember and Apply |

## CSE804P (PW) - Project II

Click for Syllabus Structure

| Teaching Scheme | | | Evaluation Scheme | | |
|---|---|---|---|---|---|
| **Practical** | **:** | 4 Hrs/Week | **ISA** | **:** | 100 Marks |
| **Credits** | **:** | 6 | **ESE(OE)** | **:** | 100 Marks |

| **Course Objective :** The objective of this course is to | |
|---|---|
| 1 | Learn how to implement their software and/or hardware project in a schedule-driven process based on their requirements and specification documents |
| 2 | Learn how to write a risk management plan and test plan document. |
| 3 | Learn how to test their project based on their test plan document. |
| 4 | Demonstrate the workable projects with desired output as specified in the design report (Project-I) |

**Course Outcomes :**

| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
|---|---|---|
| CO1 | Review and update the SRS and design document as per need of the project | Plan |
| CO2 | Start implementing the Project as specified in the SRS document | Apply |
| CO3 | Conduct various testing techniques and focus on risk mitigation plan | Analyze |
| CO4 | Write the final Project Report including all the aspects of Project | Compose |
| CO5 | Deliver the final presentation and demonstration on the workable Project | Construct |

**Course Contents :**

The group will continue to work on the project selected during the semester VII and submit the completed Project work to the department at the end of semester VIII as mentioned below.

- The workable project.
- The project report in the bound journal complete in all respect with the following
  - Problem specifications
  - System definition – requirement analysis.
  - System design – dataflow diagrams, database design
  - System implementation – algorithm, code documentation
  - Test results and test report.
  - In case of object oriented approach – appropriate process be followed

**ISA(Term Work )**

The ISA will be jointly assessed by a panel of teachers appointed by head of the Institution

**Note**

- Project work should be continually evaluated based on the contributions of the group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.
- Two mid-term evaluations should be done, which includes presentations and demos of the work done.
- Care should be taken to avoid copying and outsourcing of the project work.

## CSE805I-Industrial Internship

Click for Syllabus Structure

| Teaching Scheme | | Evaluation Scheme | | |
|---|---|---|---|---|
| **Lectures** | **:** -- | **ISA** | **:** | 100 Marks |
| **Credits** | **:** 4 | | | |
| **Tutorials** | **:** -- | **OE** | **:** | 100 Marks |

| **Course Objective:** The objective of this course is to | |
|---|---|
| **1** | Expose the students to industry environment and to take up on-site assignment as trainees or interns. |

| **Course Outcomes:** | | |
|---|---|---|
| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
| **CO1** | Have an exposure to industrial practices and ethical issues at the work environment. | Understand |
| **CO2** | Apply appropriate workplace behaviours in a professional environment. | Apply |
| **CO3** | Demonstrate content knowledge appropriate to job assignment. | Apply |
| **CO4** | Evaluate the internship experience in terms of their personal, educational and career needs. | Evaluate |
| **CO5** | Develop the solutions for real world problems in different domains. | Create |

| **Course Description :** | | |
|---|---|---|
| The course is designed to expose the students to industry environment and to take up on-site assignment as trainees or interns. | | |
| **Prerequisites :** | **1** | Completion of minimum of Six semesters |
| | **2** | Knowledge of Basic Programming Languages |
| | **3** | Database Software |

| **Details** | | |
|---|---|---|
| | **Duration: Minimum 4 Weeks** | |
| | Four weeks of work at industry site. Supervised by an expert at the industry. | |

**Mapping of POs & COs:**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 1 | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 3 | 3 | 3 |
| **CO2** | 2 | 1 | 3 | 2 | 0 | 1 | 1 | 0 | 3 | 3 | 3 | 3 |
| **CO3** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 1 | 3 | 3 |
| **CO4** | 2 | 1 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 3 | 3 |
| **CO5** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 2 | 3 | 3 |

| **Term Work** | |
|---|---|
| **1** | Mode of Evaluation: Internship Report, Presentation and Project Review. |
| **2** | Collect the Internship Completion Letter given by authorized industry. |
| **3** | Assess the work based on progress report (signed by industry expert). |

## CSE810A-Presentation/Publications

Click for Syllabus Structure

**Teaching Scheme**

**Lectures : --**
**Credits : --**
**Tutorials : --**

**Evaluation Scheme**

**ISE : ---**

**ESE : ---**

| **Course Objective :** The objective of this course is to | |
|---|---|
| 1 | Be aware about the publication ethics |
| 2 | To initiate, encourage and promote research activities among the students. |
| 3 | To initiate, develop and coordinate research and paper presentation in newly emerging areas of science and engineering including all multi-disciplinary fields. |
| 4 | Boost your professional skills and Improve your professional reputation |

| **Course Outcomes :** | | |
|---|---|---|
| **COs** | **At the end of successful completion of the course, the students will be able to** | **Bloom's Taxonomy** |
| CO1 | Understand the philosophy of science, ethics and research integrity. | Understand |
| CO2 | Increase the Presentations, Discussion, Argumentative Skills and Critical Thinking | Apply |
| CO3 | Differentiate indexing and citation databases, open access publication and research metrics and use plagiarism tools | Evaluation |

Details:

In order to promote skill development like Effective communication ,Creative ability ,Good interpersonal skill, Sound-time management, Problem-solving ability, a sense of humor etc among the students. This audit course aimed at providing a mentored opportunity to enhance up skill the student talent.

**Guidelines:** Students should submit Certificate of the Paper publication and presentations to assigned mentors.

**Member Secretary**
Board of Studies

**Chairman**
Board of Studies

**Academic Dean**
TKIET, Warananagar

**Principal**
TKIET, Warananagar

Dean, Academic
Tatyasaheb Kore Institute of Engg. & Technology (Autonomous)
Warananagar, Dist. Kolhapur

(Seal of the Institute)

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