**I SEMESTER**

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core | **18CSP01** | **ANALYSIS AND DESIGN OF ALGORITHMS** | 60 | - | 4 |

**Preamble**

To be able to carry out the analysis of various algorithms and to understand applications of Data Structures.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Acquire the knowledge on algorithms and dealing with complexities | K1 |
| CO2 | Understand the basic data structure techniques | K2 |
| CO3 | Obtain familiarity in searching and sorting methods | K3 |
| CO4 | Gain detailed knowledge on problem solving techniques | K4 |
| CO5 | Solving game theory applications | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core | **18CSP02** | **OBJECT ORIENTED ANALYSIS AND DESIGN & C++** | 60 | - | 4 |

**Preamble**

To understand the basics of C++ language and the concepts in object models.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of object model | K1 |
| CO2 | Obtaining the knowledge thoroughly on classes and objects | K2 |
| CO3 | Deals with C++ statements and functions | K3 |
| CO4 | Gain detailed knowledge on storage methods | K4 |
| CO5 | Apply and work with memory management and file management techniques | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core | **18CSP03** | **ADVANCED NETWORKS** | 60 | - | 4 |

**Preamble**

To acquire a thorough knowledge on communication systems and to learn about communication links, network level security

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of data communication and networks | K1 |
| CO2 | Gain knowledge on internet protocol layer and addressing | K2 |
| CO3 | Acquire knowledge on routing techniques in network | K3 |
| CO4 | Understand the concepts of UDP and TCP | K4 |
| CO5 | Obtain knowledge on application layer | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core | **18CSP04** | **ADVANCED SOFTWARE ENGINEERING** | 60 | - | 4 |

**Preamble**

To understand the principles of Software Quality Control and to enable the students to learn the concepts of Software Engineering

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of software engineering and its models | K1 |
| CO2 | Acquire the basic knowledge on the requirement analysis and software quality management | K2 |
| CO3 | Obtaining the knowledge thoroughly on software project management | K3 |
| CO4 | Gain detailed knowledge on software design and its techniques | K4 |
| CO5 | Obtain knowledge on test plan and maintenance | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core lab | 18CSP05 | **ALGORITHM AND OOPS PRACTICAL** | - | 60 | 4 |

**Subject Description:** This course provides hand on experience of Algorithm and OOPs concepts

**Goal :** To enable the students to learn about the usage of OOPS and Algorithm concepts

**Objectives :**

To understood the Concepts of OOPS and to gain the knowledge to solve Data Structure Problems

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core lab | 18CSP06 | **NETWORKING PRACTICAL** | - | 60 | 4 |

**Subject Description:** This course provides hand on experience on using TCP Sockets.

**Goal :** To enable the students to learn about the usage of TCP Sockets

**Objectives :** On successful completion of the course the students must have

- understood the concepts of TCP Sockets.
- Skill to use Socket Programming.

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core | 18CSP08 | ADVANCED OPERATING SYSTEMS | 60 | - | 4 |

**Preamble**

To understood the inter process communication problems and file caching schemes and to gain knowledge in Distributed OS and Unix OS

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of operating system and its process models | K1 |
| CO2 | Acquire the basic knowledge on Inter process communication | K2 |
| CO3 | Obtaining the knowledge thoroughly on Distributed operating system concepts and design | K3 |
| CO4 | Obtaining the knowledge on UNIX operating system | K4 |
| CO5 | Gain detailed knowledge on process scheduling in UNIX | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core | 18CSP09 | PHP & MySQL PROGRAMMING | 60 | - | 4 |

**Preamble**

Gain the PHP programming skills needed to successfully build interactive, data-driven sites.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Obtaining the basic concepts of PHP | K1 |
| CO2 | Gain the basic knowledge on Decision making and Looping | K1,K2 |
| CO3 | Understand the concept in string manipulation and arrays | K1,K3 |
| CO4 | Gain detailed knowledge on MySQL Commands | K4 |
| CO5 | Obtain knowledge about database manipulation using MySQL | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core | 18CSP10 | CLOUD COMPUTING | 48 | - | 3 |

**Preamble**

To understood the Cloud computing architectures, applications and challenges

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of Cloud Computing Services | K1 |
| CO2 | Acquire the basic knowledge on Cloud Computing Schedules | K2 |
| CO3 | Acquire detailed knowledge on using Cloud Services in Real Time systems. | K3,K4 |
| CO4 | Evaluating the Web Mail Services and collaborating via blogs and Wikis | K5 |
| CO5 | Understanding and Evaluating and Exploring Cloud storage with web based desktops | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core | 18CSP11 | DOT NET PROGRAMMING | 48 | - | 4 |

**Preamble**

To learn how to implement web applications in ASP.Net using web forms, including programs that interact with databases

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of .NET programming issues | K1 |
| CO2 | Understand the basic concepts of .NET statements | K2 |
| CO3 | Acquire detailed knowledge on implementing web applications | K3,K5 |
| CO4 | Acquire the detailed knowledge Navigation controls | K4 |
| CO5 | Apply and work with Database controls | K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | **18CSP12A** | **INTERNET OF THINGS** | 48 | - | 3 |

**Preamble**

- Explain in a concise manner how the general Internet as well as Internet of Things work.
- Understand constraints and opportunities of wireless and mobile networks for Internet of Things

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Obtaining the basic concepts of Inter of Things | K1,k2 |
| CO2 | Acquire the basic knowledge on Transport services | K1,K2 |
| CO3 | Understand the concept of IP-Addressing in network layer | K3 |
| CO4 | Gain detailed knowledge on real time networking | K4 |
| CO5 | Obtain knowledge about sensor body-area-network and control of a smart home through case study | K5,K6 |


| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | **18CSP12B** | **MOBILE COMPUTING** | 48 | - | 3 |

**Preamble**

To understand the mobile computing applications, techniques and its environment

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the basic concepts of mobile communication and its history | K1 |
| CO2 | Acquire the basic knowledge on cellular Mobile Communication | K2 |
| CO3 | Acquire detailed knowledge on Mobile Computing | K3 |
| CO4 | Gain the detailed knowledge on Parameters of mobile Communication System and Wireless Loop Architecture | K4 |
| CO5 | Apply and work with WCDMA in real time Systems | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Elective | 18CSP12C | **ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS** | 48 | - | 3 |

**Preamble**

To enriched knowledge regarding heuristic search and to emphasis knowledge representation in Expert systems

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of AI techniques and its issues | K1 |
| CO2 | Gain knowledge on using Predicate logic and logic programmimg | K2 |
| CO3 | Acquire detailed knowledge on statistical reasoning and knowledge representation | K3,K4 |
| CO4 | Acquire the detailed knowledge on Learning | K4 |
| CO5 | Gain detailed knowledge on common sense reasoning | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core Lab | 18CSP13 | **DOT NET PROGRAMMING PRACTICAL** | - | 36 | 3 |

**Subject Description:** This course provides hand on experience on .NET Programming

**Goal :** To enable the students to learn about .NET Programming

**Objectives :** On successful completion of the course the students must have

• Skill to create VB.NET and ASP.NET Programs

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core Lab | 18CSP14 | PHP & MySQL PROGRAMMING - PRACTICALS | - | 36 | 3 |

**Subject Description:** This course provides knowledge necessary to design and develop dynamic, database-driven Web pages.

**Goal :** The goal of the language is to allow web developers to write dynamically generated pages quickly.

**Objectives :** On successful completion of the course the students must have

- understood the concepts of PHP

- Skill to develop a web page

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| core | 18CSP15 | Comprehension in Computer Science – II ( Self study/ Online Exam) | - | - | 1 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Skill Enhancement | 18SEP01 | CYBER SECURITY | 24 | - | 2 |

**Preamble**

To understand the basics of cyber security and the security threats in day-to-day activities.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the basic concepts of information security and its types | K1 |
| CO2 | Obtaining the knowledge thoroughly on cyber security and its principles | K1 |
| CO3 | Deals with risk management and threats | K1,K2 |
| CO4 | Gain detailed knowledge on security issues in social media | K3,K4 |
| CO5 | Apply and work with cyber security applications in real world | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CSP16 | J2EE PROGRAMMING | 48 | - | 4 |

**Preamble**

To understand the basics of J2EE architecture and concepts for developing server-side programming

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the underlying concepts of J2EE platform | K1,K2 |
| CO2 | Obtain thorough knowledge on JSP and its advanced features | K1,K2,K5 |
| CO3 | Understand the concepts of servlet and its application in server-side programming | K2,K3,K5 |
| CO4 | Familiar with database drivers, database connection in J2EE environment | K3,K6 |
| CO5 | Gain depth knowledge of entity beans and implementing business methods | K4,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CSP17 | IMAGE PROCESSING AND PATTERN RECOGNITION | 48 | - | 4 |

Preamble

To cover the basic theory and algorithms that are widely used in digital image processing

Course Outcomes

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the basic concepts of digital image processing | K1,K2 |
| CO2 | Acquire depth knowledge in image enhancement techniques | K2,K3 |
| CO3 | Explore on image degradation and restoration methods | K3,K4,K5 |
| CO4 | Deals with concepts and methods of image compression and segmentation | K5,K6 |
| CO5 | Gain knowledge in patterns and pattern classification | K4,K5 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CSP19C | **CORPORATE CULTURE & COMMUNICATION** | 48 | - | 4 |

**Preamble**

To learn about the corporate culture and the business communication concepts

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Know basic purpose of communication | K1,K2 |
| CO2 | Learn basics of oral and written communication | K1,K2 |
| CO3 | Understand the verbal and nonverbal communication | K2,K5 |
| CO4 | Familiarize in concepts of report writing | K3,K4 |
| CO5 | Analyze in writing business letters and resume | K4,K5 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CSP19A | **GIS FOR AGRICULTURE AND NATURAL RESOURCE MANAGEMENT** | 48 | - | 4 |

**Preamble**

Maximize the efficiency of decision making and planning. Provide efficient means for data distribution and handling. Complex analysis/queries is involving geographical reference data to generate new information.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the basic concepts Geographic Information System(GIS) and working with Arcmap | K1 |
| CO2 | Acquire the basic knowledge on the coordinate system and map projection | K2 |
| CO3 | Obtaining the knowledge about tables, queries and spatial joins | K3 |
| CO4 | Gain detailed knowledge on geocoding | K4 |
| CO5 | Obtain knowledge about geodatabase and Raster & Vector analysis | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Elective | 18CSP19B | PARALLEL PROCESSING | 48 | - | 4 |

**Preamble**

To understand the concepts and principles of parallel processing, Multiprocessor architecture

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of parallel processing | K1 |
| CO2 | Gain knowledge in memory and input/output system | K1,K2 |
| CO3 | Get exposed to pipeline processors and various memory organization | K2,K3 |
| CO4 | Analyze various array processors and SIMD interconnection networks | K3,K4 |
| CO5 | Deals with Multiprocessor architecture and Inter processor communication mechanism | K5 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Elective | 18CSP19C | RESEARCH METHODOLOGY | 48 | - | 4 |

**Preamble**

To expose the students with the principles, procedures and techniques of research methodology and assist in planning, carrying and implementing a research project.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Define research and describe the research process and research methods | K1,K2 |
| CO2 | Establish a theoretical framework for the research topic, define key terms, definitions and terminology, identify studies, models and case studies supporting the topic. | K2,K3 |
| CO3 | Understand and apply basic research methods including research design, data analysis and interpretation | K3,K4 |
| CO4 | Deals with basic statistics required for research | K3,K4,K5 |
| CO5 | Provide guidelines for oral and written presentation of research findings. | K5,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core Lab | 18CSP20 | IMAGE PROCESSING USING MATLAB PRACTICAL | - | 48 | 4 |

**Subject Description:** This course provides hand on experience of using MATLAB in image processing

**Goal :** To enable the students to design and implement their own imaging solutions using MATLAB to solve practical problems in image processing

**Objectives :**

The objective of this course is to study the fundamentals of digital image processing including image enhancement, filtering, segmentation and compression.

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core Lab | 18CSP21 | J2EE PRACTICAL | - | 48 | 4 |

**Subject Description:** This course provides hand on experience of implementing J2EE technologies.

**Goal :** To enable the students to work with JDBC, Servlets, JSP and EJB

**Objectives :**

The objective of this course is to study J2EE which applies to all aspects of building and developing large scale applications

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Proficiency Enhancement (Self Study) | **18PEP01** | **MU LTIMEDIA SYSTEMS** | - | - | 2 |

**Preamble**

To expose students to understand the various concepts of compression methods, hardware and software used in multimedia and to get familiar with the various file formats used in multimedia.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | To get introduced on Architecture and other multimedia evolving technologies | K1 |
| CO2 | To enrich knowledge multimedia hardware and software elements | K2,K3 |
| CO3 | To learn various multimedia input and output tools and technologies | K2,K5 |
| CO4 | To understand about various multimedia subsystems | K3,K4 |
| CO5 | To acquire knowledge how multimedia is used in day to day life in various application models. | K2,K6 |

**SEMESTER - IV**

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| **Core** | **18CSP25** | **Major Project** | - | - | 10 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core Optional | 18COP05 | **ANIMATION PRACTICAL** | - | 36 | 3 |

**Subject Description:** This course provides hand on experience of implementing animation techniques

**Goal :** To enable the students to work with Adobe Photoshop and Flash

**Objectives :**

The objective of this course is to study Photoshop and Flash which applies to all aspects of building and developing animation techniques.

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CAP15 | **PYTHON PROGRAMMING** | 48 | - | 4 |

**Preamble**

To gain knowledge on basics of Python and to enrich the *programming* skills needed for software development

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to Python Programming | K1 |
| CO2 | To acquire knowledge about Expressions, Operator Precedence, errors | K3 |
| CO3 | To develop programs using conditional statements and expressions | K3,K5 |
| CO4 | To understand iteration concepts using looping statements | K2, K4 |
| CO5 | To learn how to work with Lists, Objects and Handling exceptions. | K3, K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CAP16 | **ADVANCED JAVA** | 48 | - | 4 |

**Preamble**

Presents the basic concepts of object oriented programming, methods data types, class and objects, packages; overview of JDBC, Overview of Servlet technology.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the basics of Java Programming | K1,K2 |
| CO2 | Enrich knowledge about Remote Method Invocation | K2 |
| CO3 | To develop programs using JDBC and database access | K3 |
| CO4 | To apply the knowledge of Java Server Pages | K3, K6 |
| CO5 | Gain experience in JAR file and Swing Programming | K4, K5,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CAP17 | **RESEARCH METHODOLOGY** | 48 | - | 4 |

**Preamble**

     To expose the students with the principles, procedures and techniques of research methodology and assist in planning, carrying and implementing a research project.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Define research and describe the research process and research methods | K1,K2 |
| CO2 | Establish a theoretical framework for the research topic, define key terms, definitions and terminology, identify studies, models and case studies supporting the topic | K2,K3 |
| CO3 | Understand and apply basic research methods including research design, data analysis and interpretation | K3,K4 |
| CO4 | Deals with basic statistics required for research | K3,K4,K5 |
| CO5 | Provide guidelines for oral and written presentation of research findings. | K5,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CAP18 | DATA COMMUNICATION AND NETWORKING | 48 | - | 3 |

**Preamble**

To enable the students to learn the computer networks concepts and layer description. Understood the use of computer network and the functions of Digital Transmission.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To acquire knowledge about the use of computer networks, Network hardware and software. Usage of Reference models and examples of networks. | K1 |
| CO2 | To get introduced to Analog and Digital transmission using various Channels. | K2,K3 |
| CO3 | To acquire knowledge about Wired and wireless networks and its way of transmitting data through different layers. | K2 |
| CO4 | To understand concepts about Addressing on different protocols and process. Acquiring knowledge about congestion control and quality of data. | K2,K5 |
| CO5 | To enrich information about managing the data, security for the data using cryptography, file transfer and E-mail. | K2, K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CAP19 | **OPERATIONS RESEARCH** | 48 | - | 3 |

**Preamble**

To enable the students to understand the linear programming problems, the Inventory control concepts , the concept of replacement and CPM , PERT.

**Course Outcomes**

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

| CO NUMBER | CO STATEMENT | KNOWLEDGE LEVEL |
|-----------|--------------|-----------------|
| **CO1** | To define and understand general linear Programming problem, transportation problem, costs involved in inventory, Characteristics of queuing system,network scheduling. | $K_1, K_2$ |
| **CO2** | To apply simplex method, Modi's algorithm, Hungarian algorithm, replacement models and models in queueing system | $K_3$ |
| **CO3** | To analyze and evaluate  planning and scheduling problems | $K_4$ & $k_5$ |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core Lab | 18CAP20 | PYTHON PROGRAMMING - PRACTICAL | - | 60 | 4 |

**Subject description**: This course provide complete knowledge in Python
**Goal**: To enable the students to develop applications using Python
**Objectives**: To learn how to design and program Python applications.

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core Lab | 18CAP21 | ADVANCED JAVA - PRACTICAL | - | 60 | 4 |

**Subject Description:**

This course presents the basic concepts of object oriented programming, methods data types, class and objects, packages; overview of JDBC, Overview of Servlet technology.

**Goal:**

To enable the students to learn the basic functions, principles and concepts of java programming.

**Objectives:**

To enable the students to understand the core principles of the Java language as well as J2EE Specifications to produce well designed, effective web applications using JSP and supportive technologies.

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CAP23 | .NET PROGRAMMING | 60 | - | 5 |

**Preamble**

To gain an understanding of the Microsoft .NET architecture and implement web applications in asp.net using web forms, including programs that interact with databases.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to VB.NET and work with forms, controls and setting properties. | K1,K2 |
| CO2 | To acquire knowledge about creating menus and using Dialog boxes and Accessing data with ADO.NET. | K3 |
| CO3 | To develop a web application program using Asp.net | K3,K4 |
| CO4 | To understand the navigation controls and standard controls | K2,K5 |
| CO5 | To develop programs using various Database Controls | K3,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CAP24 | **COMPUTER GRAPHICS AND MULTIMEDIA** | 60 | - | 5 |

**Preamble**

To provide an in-depth knowledge of display systems, image synthesis, shape modeling of 2D and 3D applications and to understand basic multimedia concepts like animation and compression.

Course Outcomes

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to graphic devices and basic graphics algorithms | K1 |
| CO2 | To acquire knowledge about 2D transformation , viewing and Clippping | K3,K2 |
| CO3 | To understand the concepts of 3-D Transformation and Visible surface detection | K4 |
| CO4 | To gain knowledge on multimedia devices and concepts like animation | K2,K5 |
| CO5 | To understand the data compression techniques and algorithms | K3,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CAP25 | **SOFTWARE PROJECT MANAGEMENT** | 48 | - | 4 |

**Preamble**

To understand the fundamental principles of software project management and different methods and techniques used for project management

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to Product Life Cycle models and metrices | K1 |
| CO2 | To acquire knowledge about Software configuration management and Software quality assurance | K2,K5 |
| CO3 | To understand the concepts of Software Requirements gathering and Estimation | K2,K3 |
| CO4 | To gain in indepth knowledge on Design and development phases and Challenges faced during design and development phases and testing process | K3,K4 |
| CO5 | To understand about Project management in the maintenance phase and Globalization issues in project management | K3,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP26A | CLIENT SERVER TECHNOLOGY | 48 | - | 3 |

**Preamble**

To understand the client/server computing techniques and client/server application development and production environments

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to Client/Server Computing and applications | K1 |
| CO2 | To acquire knowledge about Client Hardware and Software and Database access tools | K2,K3 |
| CO3 | To understand the concepts of Data Management Software and Networking | K2,K5 |
| CO4 | To gain knowledge on applications development environments and integrating multivendor environments | K3,K4 |
| CO5 | To understand about Production Requirements and Hardware and Software Trends. | K3,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Elective | 18CAP26B | **DIGITAL IMAGE PROCESSING** | 48 | - | 3 |

**Preamble**

To understand the fundamentals of Digital Image Processing, image compression and segmentation

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | To get introduced to Digital Image Fundamentals and Components of an image processing system. | K1 |
| CO2 | To acquire knowledge about Image Enhancement methods in the spatial domain | K2,K4 |
| CO3 | To understand the concepts of Image Restoration and Geometric Transformations. | K2 |
| CO4 | To gain knowledge on Image compression models and standards | K3,K5 |
| CO5 | To understand about Image Segmentation and use of motion in Image Segmentation | K2,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Elective | 18CAP26C | **OPEN SOURCE SYSTEM** | 48 | - | 3 |

**Preamble**

To learn the basics of network programming using PERL and PHP.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | To get introduced to Linux and the X windows system files and Directories | K1 |
| CO2 | To acquire knowledge about viewing, editing text, analyzing and formatting text. | K2 |
| CO3 | To understand the concepts of TCP/IP and Elementary sockets | K2 |
| CO4 | To gain knowledge on PHP Programming Basics | K3 |
| CO5 | To understand about Perl Programming, File Management and Databases | K3 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP26D | **INTERNET OF THINGS** | 48 | - | 3 |

**Preamble**

To enable the students to learn the Data and Knowledge Management and use of Devices in IOT Technology.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the basic concepts of IOT Networking Core | K1,K2 |
| CO2 | Acquire depth knowledge in Network Fundamentals, Router, Switches. | K2,K3 |
| CO3 | Explore On IOT Architecture and Security aspects in IOT | K3,K4,K5 |
| CO4 | Deals With the Concepts of IOT Application Development, Application Protocols | K5 |
| CO5 | Gain knowledge by case study and Advanced IOT Applications | K4,K5,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP27A | MOBILE COMPUTING | 48 | - | 3 |

**Preamble**

To understand mobile computing applications, techniques and environment

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to mobile communication , its need and requirements | K1 |
| CO2 | To acquire knowledge Cellular Mobile Communication and Mobile Communication Standards | K2,K3 |
| CO3 | To understand the concepts of Classification of Mobile data networks Satellites in Mobile Communication | K2,K5 |
| CO4 | To gain knowledge on Working of Mobile IP , Wireless Network Security and Wireless application Protocol. | K2,K4 |
| CO5 | To understand about WCDMA Technology and Fibre Optic Microcellular Mobile Communication | K2,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP27B | **DISTRIBUTED COMPUTING** | 48 | - | 3 |

**Preamble**

        To Understand the Distributed Processing Systems Design, Client/Server Network Model and Distributed databases.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to Distributed Processing Systems , Networks and Interconnection Structures and Designing | K1 |
| CO2 | To acquire knowledge on  Distributed Databases– and the Challenges of Distributed Data | K2,K3 |
| CO3 | To understand the concepts of Design Considerations and  Synchronization of Network Databases | K2,K5 |
| CO4 | To gain  knowledge on  an **Client/Server Network Model:** ,  printer Server   an e- mail Server | K2,K4 |
| CO5 | To understand about  Levels of Transparency  and Problems of Heterogeneous Distributed Databases | K2,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP27C | **CLOUD COMPUTING** | 48 | - | 3 |

**Preamble**

To understand the Cloud computing architectures, applications and challenges

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to Cloud Computing ,Working, Benefits and Discovering cloud services. | K1 |
| CO2 | To acquire knowledge on Centralizing email communications, Mapping schedules and managing projects | K2,K3 |
| CO3 | To understand the concepts of Schedules and task management, Collaborating on event management and Collaborating on project management | K3,K4 |
| CO4 | To gain knowledge on Evaluating web mail services, web conference tools and Creating groups on social networksand Collaborating via blogs and wikis. | K5 |
| CO5 | To understand cloud storage , Evaluating on line file storage, Exploring photo sharing communities and Controlling it with web based desktops. | K3,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core Lab | 18CAP28 | .NET PROGRAMMING - PRACTICAL | - | 36 | 4 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Elective | 18CAP27D | REMOTE SENSING AND GEOMATICS FOR AGRICULTURE AND FORESTRY | 48 | - | 3 |

**Preamble**

This course enables the students to understand the application potentialities of remote sensing data separately and in combination with GIS techniques for Agriculture and Forestry.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | To get introduced to Crops Acre Age And Yield Estimation | K1,K2 |
| CO2 | Acquire depth knowledge in Soil Mapping | K2,K3 |
| CO3 | Explore On Damage Assessment and Agriculture damage prediction | K3,K4,K5 |
| CO4 | Deals With the Concepts of Forest taxonomy | K5 |
| CO5 | Gain knowledge in Climatic Impact Of Agriculture And Forestry | K4,K5,K6 |

**Subject Description**

This Course presents the Introduction to .NET programming.

**Goals**

To enable the students to learn what is .NET fundamentals, Components & techniques

**Objective**

To understood how to build the applications using .NET Programming.

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core Lab | 18CAP29 | **COMPUTER GRAPHICS AND MULTIMEDIA -PRACTICAL** | - | 36 | 4 |

**Subject Description:**

This course presents the Object Model, classes and objects, overloading, files, exception handling, OO analysis and 2D and 3D animation techniques with graphic techniques.

**Goal:**

To enable the students to learn the basic functions, principles and concepts of Object oriented programming, 2D animation techniques and Photoshop tools

**Objectives:**

To understood the Object model and relationship among objects and to gain knowledge in C++ programming, Flash and Photoshop

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Skill Enhancement Course: I | 18SEP15 | **CYBER SECURITY** | 24 | - | 2 |

**Preamble**

To understand the basics of cyber security and the security threats in day-to-day activities.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the basic concepts of information security and its types | K1 |
| CO2 | Obtaining the knowledge thoroughly on cyber security and its principles | K1 |
| CO3 | Deals with risk management and threats | K1,K2 |
| CO4 | Gain detailed knowledge on security issues in social media | K3,K4 |
| CO5 | Apply and work with cyber security applications in real world | K5,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core | 18CAP31 | DATA MINING AND WAREHOUSING | 60 | - | 5 |

**Preamble**

This course presents the basic data mining tasks, techniques, classification, clustering and data warehousing which could be used in real life mining.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Introduce basic Data Mining tasks and techniques. | K1 |
| CO2 | Explore on Data Mining classifications and algorithms. | K2,K3 |
| CO3 | Understand Clustering concepts and association rules. | K3 |
| CO4 | Deals with Data Warehousing concepts , OLTP & OLAP systems. | K4,K5 |
| CO5 | Acquire adequate knowledge in developing a Data Warehouse and to understand its applications. | K2,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP32A | **NATURAL LANGUAGE PROCESSING** | 60 | - | 3 |

## Preamble

To attain fundamental knowledge in natural language processing and to recognize the necessity and an ability to engage in life-long learning

## Course Outcomes

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To acquire knowledge about speech and language processing, History of NLP | K1,K2 |
| CO2 | To get introduced to Regular expressions , speech tagging and other entropy models | K2 |
| CO3 | Understand and apply Phonetics ,Automatic speech recognition | K3,K4 |
| CO4 | To enrich information about Formal grammars of English | K4,K5 |
| CO5 | Provide guidelines for  Question answering and Summarization | K5 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP32B | **SOFT COMPUTING** | 60 | - | 3 |

## Preamble

To enable the students to become familiar with various Soft Computing Techniques and to gain knowledge on applying soft computing techniques to solve optimization problems

## Course Outcomes

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to Soft Computing and Neural Networks | K1,K2 |
| CO2 | To acquire knowledge about Genetic Algorithms and its applications. | K2,K3 |
| CO3 | Enrich knowledge about Neural Networks and Kohonen self organising networks | K3 |
| CO4 | To apply the knowledge of Fuzzy Logic in several models. | K3,K4 |
| CO5 | Gain experience in Neuro-Fuzzy Modeling and Data clustering algorithms | K5,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP32C | **COMPONENT BASED SYSTEMS** | 60 | - | 3 |

**Preamble**

To enable the students to become familiar with java components with distributed systems and to gain knowledge on applying COM objects and Active X Controls.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to Software Components, Java Beans, CORBA Distributed objects | K1,K2 |
| CO2 | Obtain thorough knowledge about Garbage collection on the Client and Server , Event driven programming | K1,K3 |
| CO3 | Enrich knowledge about CORBA , ORB runtime system and their applications. | K3,K4 |
| CO4 | Familiar with Distributed Object Database management, DOM architectures | K3,K4,K5 |
| CO5 | Depth knowledge of Applying COM objects and ActiveX Controls | K3,K5 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP32C | GIS FOR LAND RESOURCE MANAGEMENT | 60 | - | 3 |

## Preamble

To develop the skills in utilization of technologies of remote sensing, GIS, GPS, etc. in Land Resource Analysis and planning for sustainable development, soil, forest, ecology and agricultural resources management and studies.

## Course Outcomes

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To acquire knowledge about Geological and Geo-technical studies | K1,K2 |
| CO2 | To get introduced to Applications in soil | K2 |
| CO3 | Understand about Forest and Ecology | K3,K4 |
| CO4 | To enrich information about Deforestation and Afforestation | K3,K4,K5 |
| CO5 | Deals with Application in agriculture | K5,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Elective | 18CAP33A | **C# PROGRAMMING** | 60 | - | 3 |

## Preamble

To understand the basics of developing programs using C# on .NET and to Debug, compile, and run a simple application.

## Course Outcomes

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | To get introduced to C# programming and understanding .net | K1 |
| CO2 | To gain knowledge in Object Oriented Aspects Of C# | K1,K2 |
| CO3 | To get exposed to Application Development On .Net | K3,K4 |
| CO4 | To analyze Web Based Application Development On .Net | K3 |
| CO5 | Depth knowledge of CLR AND .NET Framework | K4,K5 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP33B | ROBOTICS | 60 | - | 3 |

## Preamble

To learn about fundamental concepts in robotics and to provide an introductory understanding of robotics to the students.

## Course Outcomes

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | To get introduced to anatomy, law of Robotics and its classifications. | K1,K2 |
| CO2 | To gain knowledge in End Effectors And Robot Controls | K2 |
| CO3 | To analyze Robot Transformations And Sensors | K3,K4 |
| CO4 | Deals with Robot Cell Design And Application | K3,K4 |
| CO5 | Depth knowledge of Micro/Nano Robotics System and their principles | K4,K5 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP33C | **LEARNING BIG DATA & HADOOP** | 60 | - | 3 |

**Preamble**

To introduce the concepts and challenges of big data and focuses on big data handling concepts, R Programming, Map Reduce and Hadoop based analytics.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the basic concepts of Big Data and Pioneers of Big Data | K1 |
| CO2 | Acquire depth knowledge to performing data modeling in R | K2,K3 |
| CO3 | Explore on Installing Hadoop and understanding different Hadoop modes | K3,K5 |
| CO4 | Gain knowledge in HDFS, MapReduce architecture | K3 , K4 |
| CO5 | Depth knowledge in the components of HDFS and MapReduce | K4,K6 |

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Elective | 18CAP33D | **INFORMATON RETRIEVAL TECHNIQUES** | 60 | - | 3 |

**Preamble**

To introduce the concepts and challenges of information retrieval on data storage and various multimedia operations used on information retrieval systems

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|-----------|--------------|-----------------|
| CO1 | Understand the basic concepts of information storage and retrieval techniques | K1 |
| CO2 | Performing structural query and other query operations | K2,K3 |
| CO3 | Explore information retrieval process in multimedia techniques | K3,K5 |
| CO4 | Gain knowledge in text operations with user interface | K3 , K4 |
| CO5 | Create knowledge in Online IR systems and other public access catalogs | K4,K6 |

| CATEGORY | COURSE CODE | Title of the Course | L | P | CREDIT |
|----------|-------------|---------------------|---|---|--------|
| Core Lab | 18CAP34 | **DATA MINING USING R - PRACTICAL** | - | 72 | 4 |

**Subject Description:** This course provides hand on experience to Data Mining Using R

**Goal :** Candiates pursuing this course will be aligned with the current market job requirements.

**Objectives :** This course is designed to imbibe the best practice programming skills in Data Mining with R with real world Machine Learning case studies

| CATEGORY | COURSE CODE | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Proficiency Enhancement | **18PEP01** | **MULTIMEDIA SYSTEMS** | - | - | 2 |

**Preamble**

To expose students to understand the various concepts of compression methods, hardware and software used in multimedia and to get familiar with the various file formats used in multimedia.

**Course Outcomes**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | To get introduced on Architecture and other multimedia evolving technologies | K1 |
| CO2 | To enrich knowledge multimedia hardware and software elements | K2,K3 |
| CO3 | To learn various multimedia input and output tools and technologies | K2,K5 |
| CO4 | To understand about various multimedia subsystems | K3,K4 |
| CO5 | To acquire knowledge how multimedia is used in day to day life in various application models. | K2,K6 |

| CATEGORY | Course Code | Title of the Course | C | P | CREDIT |
|---|---|---|---|---|---|
| Core | 18CAP39 | Major Project | - | - | 10 |