# SOFTWARE PROJECT PLANNING AND MANAGEMENT

[As per Choice Based Credit System (CBCS) scheme](#)
(Effective from the academic year 2016 -2017)

## SEMESTER - II

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>IA Marks</th>
<th>Number of Lecture Hours/Week</th>
<th>Exam Marks</th>
<th>Total Number of Lecture Hours</th>
<th>Exam Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>16SSE21</td>
<td>20</td>
<td>04</td>
<td>80</td>
<td>50</td>
<td>03</td>
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### CREDITS - 04

#### Course objectives:
This course will enable students to
- Define and highlight importance of software project management.
- Formulate strategy in managing projects
- Estimate the cost associated with a project
- Plan, schedule and monitor projects for the risk management
- Define the software management metrics

<table>
<thead>
<tr>
<th>Module -1</th>
<th>Teaching Hours</th>
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</thead>
<tbody>
<tr>
<td>Metrics: Introduction, The Metrics Roadmap, A Typical Metrics Strategy, What Should you Measure?, Set Targets and track Them, Understanding and Trying to minimize variability, Act on data, People and Organizational issues in Metrics Programs, Common Pitfalls to watch out for in Metrics Programs, Matrices implementation checklists and tools, Software configuration management: Introduction, Some Basic Definitions and terminology, the processes and activities of software configuration management, configuration status accounting, configuration audit, software configuration management in geographically distributed teams, Metrics in software configuration management, software configuration management tools and automation.</td>
<td>10 Hours</td>
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<tr>
<th>Module -2</th>
<th>10 Hours</th>
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<tr>
<th>Module – 3</th>
<th>10 Hours</th>
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<tbody>
<tr>
<td>Software Requirements gathering: Inputs and start criteria for requirements gathering, Dimensions of requirements gathering, Steps to be followed during requirements gathering, outputs and quality records from the requirements phase, skill sets required during requirements phase, differences for a shrink-wrapped software, challenges during the requirements management phase, Metrics for requirements phase. Estimation: What is Estimation? when and why is Estimation done?, the three phases of Estimation, Estimation methodology, formal models for size Estimation, Translating size Estimate into effort Estimate, Translating effort Estimates into schedule Estimate, common challenges during Estimation , Metrics for the Estimation processes. Design and Development Phases: Some differences in our chosen approach, salient features of design, evolving an architecture/ blueprint, design for reusability, technology choices/ constraints, design to standards, design for portability, user interface issues, design for testability, design for diagnose ability, design for maintainability, design for install</td>
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</table>
ability, inter-operability design, challenges during design and development phases, skill sets for design and development, metrics for design and development phases.

**Module-4**

Project management in the testing phase: Introduction, What is testing?, what are the activities that makeup testing?, test scheduling and types of tests, people issues in testing, management structures for testing in global teams, metrics for testing phase. Project management in the Maintenance Phase: Introduction, Activities during Maintenance Phase, management issues during Maintenance Phase, Configuration management during Maintenance Phase, skill sets for people in the maintenance phase, estimating size, effort, and people resources for the maintenance phase, advantages of using geographically distributed teams for the maintenance phase, metrics for the maintenance phase.

**Module-5**

Globalization issues in project management: Evolution of globalization, challenges in building global teams, Models for the execution of global projects, some effective management techniques for managing global teams. Impact of the internet on project management: Introduction, the effect of internet on project management, managing projects for the internet, Effect on the project management activities. People focused process models: Growing emphasis on people centric models, people capability maturity model(P-CMM), other people focused models in the literature, how does an organization choose the models to use?

**10 Hours**

**Course outcomes:**

At the end of this course students will be able to:
- Evaluate a project to develop the scope of work, provide accurate cost estimates and to plan the various activities
- Apply risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales
- Identify the resources required for a project and to produce a work plan and resource schedule
- Monitor the progress of a project and to assess the risk of slippage, revising targets counteract drift
- Use appropriate metrics to management the software development outcome
- Develop research methods and techniques appropriate to defining, planning and carrying out a research project within your chosen specialist area within the management of software projects.

**Question paper pattern:**

The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer 5 full questions, selecting one full question from each module.

**Text Books:**


**Reference Books:**

## Course objectives:

This course will enable students to

- Explain Web Application Development and related terminologies
- Demonstrate persistent framework and other ORM tools.
- Illustrate solutions using Design Patterns
- Outline latest WEB frameworks

### Module 1

**Web application and java EE 6:** Exploring the HTTP Protocol, Introducing web applications, describing web containers, exploring web architecture models, exploring the MVC architecture. **Working with servlets 3.0** Exploring the features of java servlet, Exploring new features in servlet 3.0, Exploring the servlet API, explaining the servlet life cycle, creating a sample servlet, creating a servlet by using annotation, working with servlet config and servlet context objects, working with the HTTP servlet request and HTTP servlet response interfaces, Exploring request delegation and request scope, implementing servlet collaboration.

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<th>Teaching Hours</th>
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### Module 2

**Handling sessions in servlet 3.0:** Describing a session, introducing session tracking, Exploring the session tracking, mechanisms, using the java servlet API for session tracking, creating login application using session tracking. **Implementing event handling** Introducing events, Introducing event handling, working with the servlet events, developing the online shop web application. **Working with java server pages:** Introducing JSP technology, Exploring new features of JSP2.1, listing advantages of JSP over java servlet, Exploring the architecture of a JSP page, Describing the life cycle of a JSP page, working with JSP basic tags and implicit objects, working with the action tags in JSP, exploring the JSP unified EL, using functions with EL.

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<tr>
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<td>10 Hours</td>
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</table>

### Module 3

**Implementing JSP tag extensions:** Exploring the elements of tag extensions, Working with classic tag handlers, Exploring the tag extensions, Working with simple tag handlers. **Implementing java server pages standard tag library 1.2:** Introducing JSTL, Exploring the tag libraries JSTL, working with the core tag library. **Implementing filters:** Exploring the need of filters, exploring the working of filters, exploring filters API, configuring a filter, creating a web application using filters, using initializing parameter in filters.

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### Module 4

**Persistence Management and Design Patterns:** Implementing java persistence using hibernate Introducing hibernate, exploring the architecture of hibernate, downloading hibernate, exploring HQL, understanding hibernate O/R mapping, working with hibernate, Implementing O/R mapping with hibernate. **Java EE design patterns:** Describing the java EE application architecture, Introducing a design patterns, discussing the role of design patterns, exploring types of patterns.

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### Module 5

**Web Frameworks:** **Working with struts 2** Introducing struts 2, understanding actions in struts 2. **Working with java server faces 2.0:** Introducing JSF, Explaining the

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</table>
features of JSF, Exploring the JSF architecture, describing JSF elements, Exploring the JSF request processing life cycle. **Working with spring 3.0:** Introducing features of the spring framework, exploring the spring framework architecture, exploring dependency injection & inversion of control, exploring AOP with spring, managing transactions. **Securing java EE 6 applications:** Introducing security in java EE 6, exploring security mechanisms, implementing security on an application server.

### Course Outcomes

The students should be able to:

- Explain WEB basics and their functionalities
- Develop JAVA support and API skills
- Build a WEB application.
- Build Security mechanisms

### Question paper pattern:

The question paper will have ten questions. There will be 2 questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.

### Text Books:

1. Kogent learning solution: JAVA SERVER PROGRAMMING JAVA EE6(J2EE 1.6), Dreamtech press 2014

### Reference Books:

1. NIL
**SOFTWARE DESIGN PATTERNS**  
[As per Choice Based Credit System (CBCS) scheme]  
(Effective from the academic year 2016 -2017)  
**SEMESTER - II**

<table>
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<th>Subject Code</th>
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<th>IA Marks</th>
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<tr>
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<td>Exam Marks</td>
<td>80</td>
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<tr>
<td>Total Number of Lecture Hours</td>
<td>50</td>
<td>Exam Hours</td>
<td>03</td>
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**CREDITS – 04**

**Course objectives:** This course will enable students to
- Develop functionality to designs while minimizing complexity.
- What code qualities are required to maintain to keep code flexible?
- Categorize the common design patterns.

<table>
<thead>
<tr>
<th>Module -1</th>
<th>Teaching Hours</th>
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<tbody>
<tr>
<td>Introduction: what is a design pattern? describing design patterns, the catalog of design pattern, organizing the catalog, how design patterns solve design problems, how to select a design pattern, how to use a design pattern. What is object-oriented development? key concepts of object oriented design other related concepts, benefits and drawbacks of the paradigm</td>
<td>10 Hours</td>
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</table>

| Module -2 | |
|-----------| |
| Analysis a System: overview of the analysis phase, stage 1: gathering the requirements functional requirements specification, defining conceptual classes and relationships, using the knowledge of the domain. Design and Implementation, discussions and further reading. | 10 Hours |

| Module – 3 | |
|-----------| |
| Design Pattern Catalog: Structural patterns, Adapter, bridge, composite, decorator, facade, flyweight, proxy. | 10 Hours |

| Module-4 | |
|-----------| |
| Interactive systems and the MVC architecture: Introduction, The MVC architectural pattern, analyzing a simple drawing program, designing the system, designing of the subsystems, getting into implementation, implementing undo operation, drawing incomplete items, adding a new feature, pattern based solutions. | 10 Hours |

| Module-5 | |
|-----------| |
| Designing with Distributed Objects: Client server system, java remote method invocation, implementing an object oriented system on the web (discussions and further reading) a note on input and output, selection statements, loops arrays. | 10 Hours |

**Course outcomes:**
The student should be able to
- Design and implement codes with higher performance and lower complexity
- Discover code qualities needed to keep code flexible
- Assess the quality of a design with respect to these principles.
- Apply principles in the design of object oriented systems.
- Demonstrate an understanding of a range of design patterns.
- Comprehending a design presented using this vocabulary.
- Select and apply suitable patterns in specific contexts

**Question paper pattern:**
The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer 5 full questions, selecting one full question from each module.
Text Books:

Reference Books:
1. Frank Bachmann, RegineMeunier, Hans Rohnert “Pattern Oriented Software Architecture” – Volume 1, 1996.

SOFTWARE METRICS AND QUALITY ASSURANCE
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)
SEMESTER - II

<table>
<thead>
<tr>
<th>Subject Code</th>
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<th>Teaching Hours</th>
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<tbody>
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IA Marks 20

Number of Lecture Hours/Week 04 Exam Marks 80

Exam Hours 03

CREDITS - 04

Course objectives: This course will enable students to
- Define metrics, measurement theory and related Terminologies
- Assess the quality level of internal and external attributes of the software product
- Explain of software reliability and to illustrate how to perform planning, executing and testing for software reliability
- Evaluate various metrics and models of software reliability
- Compare various models of software reliability based on its application

Module -1


Module -2

Applying The Seven Basic Quality Tools In Software Development: Ishikawa’s Seven Basic Tools, Checklist, Pareo Diagram, Histogram, Run Charts, Scatter Diagram, Control Chart, Cause And Effect Diagram. The Rayleigh Model: Reliability Models, The Rayleigh Model Basic Assumptions, Implementation, Reliability And Predictive Validity.

Module – 3

Complexity Metrics And Models: Lines Of Code, Halstead’s Software Science, Cyclomatic Complexity Syntactic Metrics, An Example Of Module Design Metrics In Practice. Metric And Lessons Learned For Object Oriented Projects: Object Oriented
### Module-4

**Availability Metrics:** Definition and Measurement of System Availability, Reliability, Availability, and Defect Rate, Collecting Customer Outage Data for Quality Improvement, In Process Metrics for Outage and Availability. **Conducting Software Project Assessment:** Audit, Ad Assessment, Software Process Maturity Assessment, and Software Project Assessment. Software Process Assessment and A Proposed Software Project Assessment Method.

**10 Hours**

### Module-5


**10 Hours**

### Course Outcomes:

Upon completion of the course, students shall be able to:
- Identify and apply various software metrics, which determine the quality level of software.
- Identify and evaluate the quality level of internal and external attributes of the software product.
- Compare and pick out the right reliability model for evaluating the software.
- Evaluate the reliability of any given software product.
- Design new metrics and reliability models for evaluating the quality level of the software based on the requirement.

### Question Paper Pattern:

The question paper will have ten questions. There will be 2 questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.

### Text Books:


### Reference Books:


### DATA MINING & DATA WAREHOUSING

[As per Choice Based Credit System (CBCS) scheme]
### Course objectives:
The course will enable students to:
- Define Data warehousing Architecture and Implementation
- Explain Data mining principles and techniques and Introduce DM as a cutting edge business intelligence
- Interpret association rule mining for handling large data
- Classification for the retrieval purposes
- Explain clustering techniques in details for better organization and retrieval of data

### Module -1
**Teaching Hours**
- Introduction and Data Preprocessing: Why data mining, What is data mining, What kinds of data can be mined, What kinds of patterns can be mined, Which Technologies Are used, Which kinds of Applications are targeted, Major issues in data mining, Data Preprocessing: An overview, Data cleaning, Data integration, Data reduction, Data transformation and data discretization.
- Data warehousing and online analytical processing: Data warehousing: Basic concepts, Data warehouse modeling: Data cube and OLAP, Data warehouse design and usage, Data warehouse implementation, Data generalization by attribute-oriented induction.

### Module -2
- Classification: Basic Concepts: Basic Concepts, Decision tree induction, bayesian Classification Methods, Rule-Based classification, Model evaluation and selection, Techniques to improve classification accuracy.

### Module -3
- Cluster Analysis: Basic concepts and methods: Cluster Analysis, Partitioning methods, Hierarchical Methods, Density-based methods, Grid-Based Methods, Evaluation of clustering.

### Module -4
- Data mining trends and research frontiers: Mining complex data types, other methodologies of data mining, Data mining applications, Data Mining and society.

### Course outcomes:
The students shall be able to:
- Demonstrate Storing voluminous data for online processing, Preprocess the data for mining applications
- Apply the association rules for mining the data
- Design and deploy appropriate classification techniques
- Cluster the high dimensional data for better organization of the data
- Discover the knowledge imbibed in the high dimensional system

### Question paper pattern:
The question paper will have ten questions. There will be 2 questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.

### Text Books:
1. Jiawei Han, Micheline Kamber, Jian Pei: Data Mining Concepts and Techniques, ELSEVIER(MK) 3rd edition 2012.
Reference Books: NIL
| Subject Code | 16SSE252 | IA Marks | 20 |
| Number of Lecture Hours/Week | 03 | Exam Marks | 80 |
| Total Number of Lecture Hours | 40 | Exam Hours | 03 |

**CREDITS – 03**

**Course objectives:** This course will enable students to

- Define Information Retrieval with pertinence to modeling, query operations and indexing
- Explain machine learning techniques for text classification and clustering
- Contrast various applications of Information Retrieval giving emphasis to Multimedia IR, Web Search
- Interpret the concepts of queries specification judgment and search engines

**Module -1**

<table>
<thead>
<tr>
<th>Teaching Hours</th>
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<tbody>
<tr>
<td><strong>Introduction:</strong> Motivation, Basic concepts, Past, present, and future, The retrieval process. <strong>Modeling:</strong> Introduction, A taxonomy of information retrieval models, <strong>Retrieval:</strong> Adhoc and filtering, A formal characterization of IR models, Classic information retrieval, Alternative set theoretic models, Alternative algebraic models, Alternative probabilistic models, Structured text retrieval models, Models for browsing.</td>
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<td>8 Hours</td>
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**Module -2**

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<th>Teaching Hours</th>
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<tbody>
<tr>
<td><strong>Retrieval Evaluation:</strong> Introduction, Retrieval performance evaluation, Reference collections. <strong>Query Languages:</strong> Introduction, keyword-based querying, Pattern matching, Structural queries, Query protocols. <strong>Query Operations:</strong> Introduction, User relevance feedback, Automatic local analysis, Automatic global analysis.</td>
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<td>8 Hours</td>
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**Module – 3**

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**Module-4**

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<th>Teaching Hours</th>
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<tr>
<td><strong>User Interfaces and Visualization:</strong> Introduction, Human-Computer interaction, The information access process, Starting pints, Query specification, Context, Using relevance judgments, Interface support for the search process. <strong>Searching the Web:</strong> Introduction, Challenges, Characterizing the web, Search engines, Browsing, Meta searchers, Finding the needle in the haystack, Searching using hyperlinks.</td>
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<td>8 Hours</td>
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**Module-5**
### Indexing and Searching:
Introduction; Inverted Files; Other indices for text; Boolean queries; Sequential searching; Pattern matching; Structural queries; Compression. **Parallel and Distributed IR:** Introduction, Parallel IR, Distributed IR. 8 Hours

| Course outcomes: |
|------------------|----------------------------------|
| • Upon completion of the course, the students will be able to |
| • Build an Information Retrieval system using the available tools |
| • Identify and design the various components of an Information Retrieval system |
| • Apply machine learning techniques to text classification and clustering which is used for efficient Information Retrieval |
| • Analyze the Web content structure |
| • Design an efficient search engine |

### Question paper pattern:
The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer 5 full questions, selecting one full question from each module.

### Text Books:

### Reference Books:

### ADVANCED ALGORITHMS
**[As per Choice Based Credit System (CBCS) scheme]**
(Effective from the academic year 2016 -2017)

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<th>SEMESTER – II</th>
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<td><strong>Subject Code</strong></td>
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<td><strong>Number of Lecture Hours/Week</strong></td>
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<td><strong>Total Number of Lecture Hours</strong></td>
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<td><strong>CREDITS – 03</strong></td>
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<table>
<thead>
<tr>
<th>Course objectives:</th>
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<tbody>
<tr>
<td>This course will enable students to</td>
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<tr>
<td>• Define the graph search algorithms.</td>
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<td>• Explain network flow and linear programming problems.</td>
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<td>• Interpret hill climbing and dynamic programming design techniques.</td>
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<tr>
<td>• Develop recursive backtracking algorithms.</td>
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<td>• Define NP completeness and randomized algorithms</td>
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<th>Module -1</th>
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<td><strong>Teaching Hours</strong></td>
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### Module -2

**Graph Algorithms:** Bellman - Ford Algorithm; Single source shortest paths in a DAG; Johnson’s Algorithm for sparse graphs; Flow networks and Ford-Fulkerson method; Maximum bipartite matching. **Polynomials and the FFT:** Representation of polynomials; The DFT and FFT; Efficient implementation of FFT.

**Module – 3**

**Number -Theoretic Algorithms:** Elementary notions; GCD; Modular Arithmetic; Solving modular linear equations; The Chinese remainder theorem; Powers of an element; RSA cryptosystem; Primalty testing; Integer factorization

**Module-4**

**String-Matching Algorithms:** Naïve string Matching; Rabin - Karp algorithm; String matching with finite automata; Knuth-Morris-Pratt algorithm; Boyer – Moore algorithms.

**Module-5**

**Probabilistic and Randomized Algorithms:** Probabilistic algorithms; Randomizing deterministic algorithms, Monte Carlo and Las Vegas algorithms; Probabilistic numeric algorithms.

**Course outcomes:**

Upon completion of the course, the students will be able to
- Design and apply iterative and recursive algorithms.
- Design and implement optimization algorithms in specific applications.
- Design appropriate shared objects and concurrent objects for applications.

**Question paper pattern:**

The question paper will have ten questions. There will be 2 questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.

**Text Books:**


**Reference Books:**


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<table>
<thead>
<tr>
<th>Subject Code</th>
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<td>20</td>
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<tr>
<td>16SIT22/16SSE254</td>
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</table>
### Course objectives:

This course will enable students to:

- Define and Cloud, models and Services.
- Compare and contrast programming for cloud and their applications
- Explain virtualization, Task Scheduling algorithms.
- Apply ZooKeeper, Map-Reduce concept to applications.

#### Module 1: Teaching Hours

**Introduction, Cloud Infrastructure:** Cloud computing, Cloud computing delivery models and services, Ethical issues, Cloud vulnerabilities, Cloud computing at Amazon, Cloud computing the Google perspective, Microsoft Windows Azure and online services, Open-source software platforms for private clouds, Cloud storage diversity and vendor lock-in, Energy use and ecological impact, Service level agreements, User experience and software licensing. Exercises and problems.

<table>
<thead>
<tr>
<th>Module 1</th>
<th>Teaching Hours</th>
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<table>
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<tr>
<th>Module 2</th>
<th>Teaching Hours</th>
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<td>8 Hours</td>
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#### Module 3: Cloud Resource Virtualization


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<th>Module 3</th>
<th>Teaching Hours</th>
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#### Module 4: Cloud Resource Management and Scheduling

Policies and mechanisms for resource management, Application of control theory to task scheduling on a cloud, Stability of a two-level resource allocation architecture, Feedback control based on dynamic thresholds, Coordination of specialized autonomic performance managers, A utility-based model for cloud-based Web services, Resourcing bundling: Combinatorial auctions for cloud resources, Scheduling algorithms for computing clouds, Fair queuing, Start-time fair queuing, Borrowed virtual time, Cloud scheduling subject to deadlines, Scheduling MapReduce applications subject to deadlines, Resource management and dynamic scaling. Exercises and problems.

<table>
<thead>
<tr>
<th>Module 4</th>
<th>Teaching Hours</th>
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#### Module 5: Cloud Security, Cloud Application Development


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<th>Module 5</th>
<th>Teaching Hours</th>
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<td>8 Hours</td>
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### Course Outcomes

The students should be able to:
• Compare the strengths and limitations of cloud computing
• Identify the architecture, infrastructure and delivery models of cloud computing
• Apply suitable virtualization concept.
• Choose the appropriate cloud player
• Address the core issues of cloud computing such as security, privacy and interoperability
• Design Cloud Services
• Set a private cloud

**Question paper pattern:**
The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.

**Text Books:**

**Reference Books:**

**MINIPROJECT**
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)

**SEMMESTER – II**

<table>
<thead>
<tr>
<th>Laboratory Code</th>
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<td>16LNI26/ 16SCE26 / 16SCN26 /16SCS26 /16SFC26 / 16SIT26 / 16SSSE26</td>
<td>20</td>
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**Number of Lecture Hours/Week**
3 hours of lab

**Total Number of Lecture Hours**

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**CREDITS – 02**

**Course objectives:** This course will enable students to
- Enable the student to design, develop and analyze an application development

The student will carry out a mini project relevant to the course. The project must be development of an application ( Hardware/Software). It is preferable if the project is based on mobile application development.

**Course outcomes:**
- Design, develop and to analyze an application development.
- Prepare report of the project.

**Conduction of Practical Examination:**
The student shall prepare the report by including:
1. Define project ( Problem Definition)
2. Prepare requirements document
   a. Statement of work
   b. Functional requirements
   c. Software / Hardware requirements
3. Develop use cases
4. Research, analyze and evaluate existing learning materials on the application
5. Develop user interface and implement code
6. Prepare for final demo

**Evaluation:**

Evaluation shall be taken up at the end of the semester. Project work evaluation and viva-voce examination shall be conducted. Internal evaluation shall be carried by the Guide and Head of the department for 20 marks. Final examination which includes demonstration of the project and viva-voce shall be conducted for 80 Marks viz report + Outputs of the project + presentation = 30+30+20 = 80 marks.

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### SEMINAR

**[As per Choice Based Credit System (CBCS) scheme]**

(Effective from the academic year 2016-2017)

#### SEMESTER – II

<table>
<thead>
<tr>
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<th>Exam Marks</th>
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**Course Objectives:** This course will enable students to

- Motivate the students to read technical articles
- Discover recent technology developments

**Descriptions**

The students should read a recent technical article (try to narrow down the topic as much as possible) from any of the leading reputed and refereed journals like:

1. IEEE Transactions, journals, magazines, etc.
2. ACM Transactions, journals, magazines, SIG series, etc.
3. Springer
4. Elsevier publications etc

In the area of (to name few and not limited to)

- Web Technology
- Cloud Computing
- Artificial Intelligent
- Networking
- Security
- Data mining

**Course Outcomes**

The students should be able to:

- Conduct survey on recent technologies
- Infer and interpret the information from the survey conducted
- Motivated towards research

**Conduction:**

The students have to present at least ONE technical seminar on the selected topic and submit a report for internal evaluation.
<table>
<thead>
<tr>
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CREDITS – 04

**Course objectives:** This course will enable students to

- Explain key aspects of soft computing.
- Identify the components and building block hypothesis of Genetic algorithm.
- Analyze Neuro Fuzzy modeling and control.
- Evaluate machine learning through Support vector machines.

**Module 1**

**Introduction to Soft computing:** Neural networks, Fuzzy logic, Genetic algorithms, Hybrid systems and its applications. Fundamental concept of ANN, Evolution, basic Model of ANN, Terminologies used in ANN, MP model, Hebb model.

10 Hours

**Module 2**

**Perceptron Network:** Adaptive linear neuron, Multiple adaptive linear neurons, Back propagation Network (Theory, Architecture, Algorithm for training, learning factors, testing and applications of all the above NN models).

10 Hours

**Module 3**

**Introduction to classical sets and fuzzy sets:** Classical relations and fuzzy relations, Membership functions.

**Module 4**

**Defuzzification:** Fuzzy decision making, and applications.

10 Hours

**Module 5**

**Genetic algorithms:** Introduction, Basic operations, Traditional algorithms, Simple GA General genetic algorithms, The schema theorem, Genetic programming, applications.

10 Hours

**Course Outcomes**

The students should be able to:

- Implement machine learning through neural networks.
• Design Genetic Algorithm to solve the optimization problem.
• Develop a Fuzzy expert system.
• Model Neuro Fuzzy system for clustering and classification.

**Question paper pattern:**
The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.

**Text Books:**

**Reference Books:**

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**INTERNET OF THINGS**
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)

**SEMESTER – IV**

<table>
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**CREDITS – 03**

**Course objectives:** This course will enable students to
- Define and explain basic issues, policy and challenges in the IoT
- Illustrate Mechanism and Key Technologies in IoT
- Explain the Standard of the IoT
- Explain resources in the IoT and deploy of resources into business
- Demonstrate data analytics for IoT

**Module -1**

What is The Internet of Things? Overview and Motivations, Examples of Applications, IPV6 Role, Areas of Development and Standardization, Scope of the Present Investigation.Internet of Things Definitions and frameworks-IoT Definitions, IoT Frameworks, Basic Nodal Capabilities. Internet of Things Appliction Examples-Overview, Smart Metering/Advanced Metering Infrastructure-Health/Body Area Networks, City Automation, Automotive Applications, Home Automation, Smart Cards, Tracking, Over-The-Air-Passive Surveillance/Ring of Steel, Control Application Examples, Myriad Other Applications.

8 Hours

**Module -2**


8 Hours

**Module – 3**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Module-4</td>
<td>Case Studies illustrating IoT Design-Introduction, Home Automation, Cities, Environment, Agriculture, Productivity Applications.</td>
</tr>
<tr>
<td>Module-5</td>
<td>Data Analytics for IoT – Introduction, Apache Hadoop, Using Hadoop MapReduce for Batch Data Analysis, Apache Oozie, Apache Spark, Apache Storm, Using Apache Storm for Real-time Data Analysis, Structural Health Monitoring Case Study.</td>
</tr>
</tbody>
</table>

**Course outcomes:**

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

- Develop schemes for the applications of IOT in real time scenarios
- Manage the Internet resources
- Model the Internet of things to business
- Understand the practical knowledge through different case studies
- Understand data sets received through IoT devices and tools used for analysis

**Question paper pattern:**

The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer 5 full questions, selecting one full question from each module.

**Text Books:**

**Reference Books:**

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**MANAGING BIG DATA**

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016-2017)

**SEMESTER – IV**

<table>
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<tr>
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<td>Exam Hours</td>
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</tbody>
</table>

**CREDITS – 03**

**Course objectives:** This course will enable students to

- Define big data for business intelligence
- Analyze business case studies for big data analytics
- Explain managing of Big data Without SQL
- Develop map-reduce analytics using Hadoop and related tools

**Module -1**

| Teaching Hours | 8 Hours |

Module 2


Module 3


Module 4


Module 5


Course outcomes:
The students shall able to:
- Describe big data and use cases from selected business domains
- Explain NoSQL big data management
- Install, configure, and run Hadoop and HDFS
- Perform map-reduce analytics using Hadoop
- Use Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data Analytics

Question paper pattern:
The question paper will have ten questions. There will be 2 questions from each module. Each question will have questions covering all the topics under a module. The students will have to answer 5 full questions, selecting one full question from each module.

Text Books:

Reference Books:
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)

**SEMESTER – IV**

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<th>Subject Code</th>
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<td>03</td>
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</table>

**Course objectives:** This course will enable students to
- Explain iterative, incremental development process leads to faster delivery of more useful software
- Evaluate essence of agile development methods
- Illustrate the principles and practices of extreme programming
- Show the roles of prototyping in the software process
- Explain the Mastering Agility

<table>
<thead>
<tr>
<th>Module -1</th>
<th>Teaching Hours</th>
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<tr>
<td>Why Agile?: Understanding Success, Beyond Deadlines, The Importance of Organizational Success, Enter Agility, <strong>How to Be Agile?:</strong> Agile Methods, Don’t Make Your Own Method, The Road to Mastery, Find a Mentor</td>
<td>8 Hours</td>
</tr>
</tbody>
</table>

| Module -2 | |
| Understanding XP: The XP Lifecycle, The XP Team, XP Concepts, **Adopting XP:** Is XP Right for Us?, Go!, Assess Your Agility | 8 Hours |

| Module – 3 | |

| Module-4 | |
| **Mastering Agility: Values and Principles:** Commonalities, About Values, Principles, and Practices, Further Reading, **Improve the Process:** Understand Your Project, Tune and Adapt, Break the Rules, **Rely on People:** Build Effective Relationships, Let the Right People Do the Right Things, Build the Process for the People, **Eliminate Waste:** Work in Small, Reversible Steps, Fail Fast, Maximize Work Not Done, Pursue Throughput | 8 Hours |

| Module-5 | |
| **Deliver Value:** Exploit Your Agility, Only Releasable Code Has Value, Deliver Business Results, Deliver Frequently, **Seek Technical Excellence:** Software Doesn’t Exist, Design Is for Understanding, Design Trade-offs, Quality with a Name, Great Design, Universal Design Principles, Principles in Practice, Pursue Mastery | 8 Hours |
Course outcomes:

Students should be able to

- Define XP Lifecycle, XP Concepts, Adopting XP
- Evaluate on Pair Programming, Root-Cause Analysis, Retrospectives, Planning, Incremental Requirements, Customer Tests
- Demonstrate concepts to Eliminate Waste

Question paper pattern:

The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer 5 full questions, selecting one full question from each module.

Text Books:


Reference Books:


SUPPLY CHAIN MANAGEMENT
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)
SEMESTER – IV

<table>
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CREDITS – 03

Course objectives: This course will enable students to

- Define Model of SCM.
- Compare and contrast QRM, CPFR.
- Evaluate inventory Models and third party logistics.
- Explain revenue management

Module -1


8 Hours
<table>
<thead>
<tr>
<th>Module -2</th>
<th>Designing the supply chain network</th>
<th>Designing the distribution network – role of distribution – factors influencing distribution – design options – e-business and its impact – distribution networks in practice – network design in the supply chain – role of network – factors affecting the network design decisions – modeling for supply chain.</th>
<th>8 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module – 3</td>
<td>Designing and Planning Transportation Networks.</td>
<td>Role of transportation - modes and their performance - transportation infrastructure and policies - design options and their trade-offs - Tailored transportation.</td>
<td>8 Hours</td>
</tr>
<tr>
<td>Module-4</td>
<td>Sourcing and Pricing:</td>
<td>Sourcing – In-house or Outsource – 3rd and 4th PLs – supplier scoring and assessment, selection – design collaboration – procurement process – sourcing planning and analysis. Pricing and revenue management for multiple customers, perishable products, seasonal demand, bulk and spot contracts.</td>
<td>8 Hours</td>
</tr>
<tr>
<td>Course outcomes:</td>
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<td>The student shall be able to</td>
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<tr>
<td></td>
<td></td>
<td>• Discuss SCM Models,</td>
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<td>• Formulate of QRM, CPFR.</td>
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<td>• Implement various Inventory Models and third party logistics.</td>
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<tr>
<td>Question paper pattern:</td>
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<tr>
<td></td>
<td></td>
<td>2. Wisner, Keong Leong and Keah-Choon Tan, Principles of Supply Chain Management A</td>
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