



**II YEAR IV SEMESTER BSc MPCs SYLLABUS**

**SRI RAMAKRISHNA DEGREE COLLEGE (AUTONOMOUS)**

**NANDYAL**

# Cyber Laws

## Syllabus

### **Unit I**

Introduction: Computers and its Impact in Society, Overview of Computer and Web Technology, Need for Cyber Law, *Cyber Jurisprudence* at International and Indian Level.

### **Unit II**

Cyber Law- International Perspectives: UN & International Telecommunication Union (ITU) Initiatives, Council of Europe-Budapest Convention on Cybercrime, Asia-Pacific Economic Cooperation (APEC), Organization for Economic Co-operation and Development (OECD), World Bank, Commonwealth of Nations.

### **Unit III**

Constitutional & Human Rights Issues in Cyberspace: Freedom of Speech and Expression in Cyberspace, Right to Access Cyberspace – Access to Internet, Right to Privacy, Right to Data Protection.

### **Unit IV**

Cyber Crimes & Legal Framework: Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Cyber Pornography, Identity Theft & Fraud, Cyber terrorism, Cyber Defamation, Different offences under IT Act, 2000.

### **Unit V**

Cyber Torts: Cyber Defamation, Different Types of Civil Wrong under the IT Act, 2000, Intellectual Property Issues in Cyber Space, Interface with Copyright Law, Interface with Patent Law, Trade marks & Domain Names Related issues

## **Reference Books**

1. Chris Reed & John Angel, *Computer Law*, OUP, New York, (2007).
2. Justice Yatindra Singh, *Cyber Laws*, Universal Law Publishing Co, New Delhi, (2012).
3. Verma K, Mittal Raman, *Legal Dimensions of Cyber Space*, Indian Law Institute, New Delhi, (2004)
4. Jonathan Rosenoer, *Cyber Law*, Springer, New York, (1997).
5. Sudhir Naib, *The Information Technology Act, 2005: A Handbook*, OUP, New York, (2011)
6. S.R. Bhansali, *Information Technology Act, 2000*, University Book House Pvt. Ltd., Jaipur (2003). Vasu Deva, *Cyber Crimes and Law Enforcement*, Commonwealth Publishers, New Delhi, (2003).



## DATA ANALYTICS USING R

### Syllabus

#### UNIT

Introducing to R Data Structures –Help functions in R –Vectors –Scalars –  
Declarations – recycling –Common Vector operations –Using all and any –  
Vectorized operations –NA and NULL values –Filtering – Vectorised if-then else  
–Vector Equality –Vector Element names

#### **Matrices, Arrays and Lists:**

Creating matrices –Matrix operations –Applying Functions to Matrix Rows and  
Columns – Adding and deleting rows and columns –Vector/Matrix Distinction –  
Avoiding Dimension Reduction –Higher Dimensional arrays –lists –Creating lists –  
General list operations – Accessing list components and values –applying  
functions to lists –recursive lists

#### **Data Frames:**

Creating Data Frames –Matrix-like operations in frames –Merging Data Frames  
–Applying functions to Data frames –Factors and Tables –factors and levels –  
Common functions used with factors –Working with tables -Other factors and table  
related functions -Control statements –  
Arithmetic and Boolean operators and values –Default values for arguments –  
Returning Boolean values Unit II Packages in R  
Tidyr, ggplot2, ggraph, dplyr, tidyquant, dygraphs

**Introduction to Data analytics:** Overview of Bigdata, Need of Data Analytics,  
Applications of Data Analytics, Datasets, tools for data analytics

Basic Statistics: Mean, Median, Standard Deviation, Variance, Correlation, Covariance

#### **Unit III**

#### **Basic Analysis Techniques:**

Chi-Square Test, t-Test, Analysis of Variance, Correlation Analysis

#### **Unit IV**

#### **Data Analysis Techniques**

Linear Regression, Logistic Regression, Classification Techniques, Clustering  
Techniques, Ensemble model

## **UnitV**

### **Data VisualizationUsingR**

Data Visualization, Libraries used for Data Visualization in R, Bar chart, Histogram, Heatmap, Scatter plot, Box Plot, Correlogram, Area Chart

#### **TextBook:**

1. DataAnalyticsusingR, McGrawHillPublications, SeemaAcharya
2. RforDataScience: Import, Tidy, Transform, Visualize, and Model Data by Hadley Wickham, O'Reilly
3. Rumset D. J. (2010): Statistical Essentials for Dummies. Hoboken: Wiley Publishing

# DATAMINING and WARE HOUSING

## Syllabus

### UnitI

**Introduction:** What Motivated Data Mining? Why Is It Important?, So, What Is Data Mining? , *Data Mining—On What Kind of Data?:* Relational Databases, Data Warehouses, Transactional Databases. Data Mining Functionalities—What Kinds of Patterns Can Be Mined? , *Data Preprocessing:WhyPreprocesstheData?,DescriptiveDataSummarization:MeasuringtheCentral Tendency, Measuring the Dispersion of Data, Data Cleaning, Data Integration and Transformation, Data Reduction.*

### UnitII

**Data Warehouse and OLAP Technology: An Overview** , What Is a Data Warehouse? , A Multidimensional Data Model, From Tables and Spreadsheets to Data Cubes, Stars, Snowflakes, and Fact Constellations: Schemas for Multidimensional databases, Examples for Defining Star, Snowflake and Fact Constellation Schemas, Measures: Their Categorization and Computation, Concept Hierarchies, OLAP Operations in the Multidimensional Data Model. *Data Warehouse Architecture:Steps for the Design and Construction of Data Warehouses,A Three- Tier Data Warehouse Architecture, Data Warehouse Back-End Tools and Utilities. Data Warehouse Implementation.*

### UnitIII

**Mining Frequent Patterns, Associations, and Correlations:** Basic Concepts and a Road Map, *Efficient and Scalable Frequent Itemset Mining Methods:* The Apriori Algorithm: Finding Frequent Itemsets Using Candidate Generation, Generating Association Rules from Frequent Itemsets, Improving the Efficiency of Apriori, Mining Frequent Itemsets without Candidate Generation. *Mining various kinds of Association Rules:* Mining Multilevel Association Rules, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses.

### UnitIV

**Classification and Prediction:** What Is Classification? What Is Prediction? , Issues Regarding ClassificationandPrediction,ClassificationbyDecisionTreeInduction,DecisionTreeInduction, Attribute Selection Measures. *Bayesian Classification:* Naïve Bayesian Classification, Bayesian Belief Networks, Training Bayesian Belief Networks. *Rule-Based Classification:* Using IF-THEN Rules for Classification, Rule Extraction from a Decision Tree, Rule Induction Using aSequential Covering Algorithm.

### UnitV

**Cluster Analysis:** What is Cluster Analysis? , Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods. *Hierarchical Methods:* Agglomerative and Divisive Hierarchical Clustering, BIRCH: Balanced Iterative Reducing and Clustering Using Hierarchies . Density-Based Methods, Outlier Analysis.

**Prescribed Text Book:**

1. Data Mining: Concepts and Techniques Second Edition Jiawei Han  
University of Illinois at Urbana-Champaign Micheline Kamber

**References:**

1. Data Mining by Vikram Pudi, P. Radha Krishna, Oxford Universal Press
2. Data Warehousing by Reema Thareja, Oxford University Press
3. J. Han, M. Kamber and J. Pei, Data Mining: Concepts and Techniques, 3rd Edition Morgan Kaufmann, 2011
4. Introduction to Data Mining – G.K. Gupta, PHI
5. Data Mining, Data Warehouse & OLAP – Berson, Tata McGraw Hill

## DESIGN OF OBJECT ORIENTED APPLICATIONS

### Syllabus

#### UNIT I:

**Process-First Principles:** Traits of Successful Projects: Strong Architectural Vision, Iterative and Incremental Lifecycle. Toward a Rational Development Process, *The Macro Process:* The Software Development Lifecycle, Overview, The Macro Process Content Dimension-Disciplines, The Macro Process Time Dimension-Milestones and Phases, The Macro Process Time Dimension-Iterations, Release Planning. *The Micro Process:* The Analysis and Design Process, Overview, Level of Abstraction, Activities, Products, The Micro Process and Level of Abstraction, Identifying Elements, Defining Elements of Collaborations, Defining Element Relationships, Detailing Element Semantics.

#### UNIT II:

**Pragmatics-Management Planning:** Risk Management, Task Planning, Development Review. *Staffing:* Resource Allocation, Development Team Roles. *Release Management:* Configuration Management and Version Control, Integration, Testing. *Reuse:* Elements of Reuse, Institutionalizing Reuse. *Quality Assurance and Metrics:* Software Quality, Object-Oriented Metrics. *Documentation:* Development Legacy, Documentation Contents. *Tools:* Kinds of Tools, Organizational Implementations. *Special Topics:* Domain-Specific Issues, Adopting Object-Oriented Technology. *The Benefits and Risks of Object-Oriented Development:* The Benefits of Object Oriented Development, The Risk of Object Oriented Development.

#### UNIT III:

**System Architecture:** *Satellite-Based Navigation:* Inception, Elaboration, Construction, Post-Transition. **Control System:** *Traffic Management:* Inception, Elaboration, Construction, Post-Transition.

#### UNIT IV:

**Artificial Intelligence:** *Cryptanalysis:* Inception, Elaboration, Construction, Post-Transition. **Data Acquisition:** *Weather Monitoring station:* Inception, Elaboration, Construction, Post-Transition.

#### UNIT V:

**Web Application:** *Vacation Tracking System:* Inception, Elaboration, Construction, Transition and Post-Transition.



**Object-Oriented Programming Languages:** Language Evolution, Smalltalk,C++,Java.

**TEXTBOOK:**

1. Object-Oriented Analysis and Design with Applications, 3rd Edition,

By: Robert

A.Maksimchuk,BobbiJ.Young,GradyBooch,JimConallen,MichaelW.Engel,KelliA.Houston, Pearson education.

**REFERENCEBOOKS:**

1. GradyBooch, ObjectOrientedAnalysisandDesignwithApplications, 2nd Edition, Pearson education 1999.

2. Jacobson et al., The Unified Software Development Process, AW 1999.

3. Tom Pender, UML Bible, John Wiley and sons.

# Object Oriented Software Engineering

## Syllabus

**Unit – I**      **The Scope of Object Oriented Software Engineering:** Historical Aspects, Economic Aspects, Maintenance Aspects, Requirements, analysis and design aspects, the object oriented Paradigm, Terminology, Ethical Issues.

**Software Life Cycle Models:** Software Development t In Theory, Risks and other aspects of Iteration and Incrementation, Managing Iteration and Incrementation, other Life Cycle Models: Code and Fix, Waterfall, Rapid Prototyping, Open Source, Agile Processes, Synchronize and Stabilize, Spiral Models, Comparison of Life Cycle Models.

**Unit-II**      **The Software Process :** The Unified Process, Iteration and Incrementation, The Requirements Workflow, The Analysis workflow, The Design Workflow ,The Implementation workflow, the test workflow, Post Delivery Maintenance, Retirement, the phases of the unified process, one-versus two-dimensional life cycle models, improving the software process, capability maturity models, costs and benefits of software process improvement.

**Teams :** Team Organization, Democratic Team Approach, Chief Programmer Team Approach, Synchronize and Stabilize Teams, Teams for Agile processes, open source programming teams, people capability maturity model choosing an appropriate team.

**Unit-III**      **ModelstoObjects:**                    what is a module? Cohesion, Coupling, Data Encapsulation, Abstract Data Types, Information Hiding, Objects, Inheritance, Polymorphism and Dynamic Binding, The Object-Oriented Paradigm.

**Reusability and Portability:** Objects and Reuse, Reuse during design and implementation reuse and post delivery maintenance, portability, techniques for achieving portability.

**Planning and Estimating:** planning and the software process, Estimating duration and cost, components of a software project management plan, software project management plan framework, planning testing, training requirements, documentations standards.

**Unit-IV**      **The Requirements workflow:** Determining what client needs , overview of the requirements, understanding the domain, the business model, initial

requirements, what are object-oriented requirements, rapid prototyping , human factors, reusing the rapid prototype, metrics for the requirement workflow, challenges of the requirements workflow.

**The Analysis Workflow:** The specification document, informal specifications, the analysis workflow, extracting the entity classes ,challenges of the analysis workflow.

**The Design Workflow:** Object –Oriented Design, the design workflow, formal techniques for detailed design, real time design techniques, CASE tools for design, metrics for design, challenges of the design workflow.

#### **Unit-V**

**The implementation workflow:** choice of programming languages, good programming practice, coding standards, code reuse, integration, the implementation workflow.

**Testing:** Quality Issues, Non – Execution based testing, execution based testing, what should be tested?, testing versus correctness proofs, who should perform execution based testing?, when testing stops. Test case selection, Black

Box Unit Testing techniques, Glass-Box Unit Testing Techniques, code walkthrough and inspections, comparison of unit testing techniques, clean room, testing issues integration testing, product testing, and acceptance testing metrics for the implementation workflow challenge of the implementation workflow.

**Post delivery Maintenance:** Why post delivery maintenance is necessary, what is required of post delivery maintenance programmers? Management of post delivery maintenance, maintenance issues, reverse engineering testing during post delivery maintenance metrics for post delivery maintenance, challenges for the post delivery maintenance.

# Web Programming

## Syllabus

### **Unit-I:PHP Basics**

**9Hrs.**

Introduction, Identifiers, Variables, Constants, Data Types, Operators, Conditional Statements, PHP Loops.

**Working with Arrays:**Arrays, Creating Arrays, some Array-Related Functions. Working with Objects: Creating Objects, Object Instance. Working with Strings, Dates and Time: Formatting Strings with PHP), Investigating Strings with PHP , Manipulating Strings with PHP, Using Date and Time Functions in PHP.

### **Unit-II:PHPAdvanced**

**9Hrs.**

Advantages of Using functions, Types of functions, creating and invoking functions, returning values, recursive functions, Object Oriented Concepts, File handling and Data Storage:creating, open/close a file, file operations: read,write,append. File truncate, file uploading, EOF in PHP.

### **Unit-III:WorkingwithFormsin PHP**

**9H**

**rs.**

Creating Forms, Accessing Form - Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending MailonFormSubmission,andWorkingwithFile Uploads.Workingwith Cookiesand UserSessions:

Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsettling Variables, Using Sessions in an Environment with Registered Users.

### **Unit-IV:IntroductiontoJavaScript**

**9**

**Hrs.**

**Java Script:** Introduction – Basic commands – Variables – Operators – Control structures – Arrays -Window and document object – Forms and form elements – String, math and dates – multiple windows.

### **Unit-V:AngularJS**

**9Hrs.**

Getting started with Angular JS, Modules, Components, Built in Directives, Custom directives. Use of built – in directive, Data Binding, filters, custom filters, constants.

**References:**

1. FUNDAMENTALSOFOPENSOURCESOFTWARE,MNRAO,PHI,2015.
2. JulieC.Meloni,PHPMySQLandApache,SAMSTeachYourself,Pears onEducation (2007).
3. WebTechnologies,A.a.Puntambekar,2013,TechnicalPublications
4. <https://books.goalkicker.com/AngularJSBook/>