

Rajarshi Shahu Mahavidyalaya, Latur (Autonomous)  
 Department of Computer Science  
**Curriculum Structure with effect from June, 2019**

|   | Course Code | Core Course | Title of the course with paper number                                      | Hours/Week | Marks (50) |              | Credits      |
|---|-------------|-------------|--|------------|------------|--------------|--------------|
|   |             |             |  |            | Internal   | End Semester |              |
| <b>B. Sc. III (Computer Science) Semester V</b> | U-COS-541   | DSEE-I      | Relational Database Management System - IX                                 | 03         | 20         | 30           | 02           |
|   | U-COS-542   | DSEE -II    | Programming in C#.net<br>- X A<br><br>or<br>Programming in VB. Net<br>-X B | 03         | 20         | 30           | 02           |
|   | U-COS-543   | DSEEP-I     | Laboratory Course -VII<br>(RDBMS)  | 03         | 20         | 30           | 02           |
|   | U-COS-544   | DSEEP-II    | Laboratory Course -VIII<br>(DSE.)  | 03         | 20         | 30           | 02           |
|   |             | SECCOS-3    | Web Page Designing   | 03         | 25         | 25           | 2            |
|   |             |             | <b>Total Credits</b>   |            |            |              | <b>06+02</b> |

**Student Stay Hours: 15/Week**

|   | Course Code | Core Course | Title of the course with paper number  | Hours/Week | Marks (50) |              | Credits      |
|---|-------------|-------------|--|------------|------------|--------------|--------------|
|   |             |             |  |            | Internal   | End Semester |              |
| <b>B. Sc. III(Computer Science) Semester VI</b> | U-COS-641   | DSEE-I      | Web Programming using PHP and MySQL - XI   | 03         | 20         | 30           | 02           |
|   | U-COS-642   | DSEE-II     | Introduction to Python Programming - XII A<br><br>Or<br>Software Engineering - XII B | 03         | 20         | 30           | 02           |
|   | U-COS-643   | DSEEP-I     | Laboratory Course-IX (PHP and MySQL)   | 03         | 20         | 30           | 02           |
|   | U-COS-644   | DSEEP-II    | Laboratory Course-X-A<br>Or<br>Laboratory Course-X-B                                 | 03         | 20         | 30           | 02           |
|   |             | SECCOS-4    | Introduction to SCILAB   | 03         | 25         | 25           | 2            |
|   |             |             | <b>Total Credits</b>   |            |            |              | <b>06+02</b> |

**Student Stay Hours: 15/Week**

**B. Sc. – III [Computer Science] Semester V**  
**Course: Relational Database Management System**  
**Course Code: U-COS-541**  
**DSEE-I**  
**Paper-IX**

**Teaching Hours : 45**

**Marks : 50**

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**Learning Objectives**

1. To implement the design of the tables in DBMS
2. To write queries to get optimized outputs
3. To store, retrieve and view the contents
4. To generate report based on customized need

**Course Outcomes:**

After successfully this course, students should be able to –

1. Identify the information that is needed to design a database management system for a business information problem.
2. Create conceptual and logical database designs for a business information problem.
3. Construct a database management system that satisfies relational theory and provide users with business queries, business forms, and business reports.
4. Analyze the core terms, concepts, and tools of relational database management systems.
5. Demonstrate skills to work in teams in teams and utilize effective group techniques to manage a complex project.

**SYLLABUS**

**UNIT I: Introduction to Database and Elements of DBMS [10 hrs]**

Definition of DBMS, File processing Vs DBMS  
Advantages and disadvantages of DBMS  
Users of DBMS, DBMS Structure ,DBMS Languages: DDL, DML, DCL  
Terms: Entity, Entity set, attributes, Keys: Primary, secondary, foreign, composite

**UNIT II: Data Models and Relational Algebra and Calculus [13 hrs]**

Introduction, Object based logical model, Record based logical model (RDB, NDB ,HDB) ,E-R model, E-R diagram, Introduction Relation, Schemes, Domain, Tuples, Cardinality degree , Algebraic operation .  
Fundamental operation: Select, product, union  
Set difference : Natural join, Cartesian product, rename  
Relational calculus: Tuple and domain relational calculus.

### **UNIT III: Relational Database Design and SQL**

**[12 hrs]**

Normalization: 1NF, 2NF, 3NF, BCNF, Class diagrams and E-R tables  
Functional dependency, Data types, Table Creation, Modify, Selecting, Deleting records  
, Simple queries, Oracle constraints

### **UNIT IV: Use of Operators and Advance in SQL**

**[10 hrs]**

**Comparison operators:** Between, In, Not In, Like, Null

**Logical operators:** AND, OR, NOT

SQL function, Joins

Sub-queries, Views.

#### **Reference Books:**

1. "Database System Concepts" by Abraham Silberschatz, Henry Korth, and S. Sudarshan
2. "Database Management Systems" by Raghu Ramakrishnan

**B. Sc. – III [Computer Science] Semester V**  
**Course: Relational Database Management System**  
**Course Code: U-COS-543**  
**DSEEP-I**  
**Paper-VII**

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**Learning Objectives:**

1. To implement the design of the tables in DBMS
2. To write queries to get optimized outputs
3. To store, retrieve and view the contents
4. To generate report based on customized need

**Course Outcome:**

After successfully completion of this course, students should be able to –

1. Identify the information that is needed to design a database management system for a business information problem.
2. Create conceptual and logical database designs for a business information problem.
3. Construct a database management system that satisfies relational theory and provides users with business queries, business forms, and business reports.
4. Analyze the core terms, concepts, and tools of relational database management systems.
5. Demonstrate skills to work in teams and utilize effective group techniques to manage a complex project.

**Proposed Practical List:**

1. Data Definition Language (DDL) commands in RDBMS
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. Study of create table command.
4. Study of insert command.
5. Study of select command.
6. Sub-query in SQL.
6. Study in operators in SQL.
7. Study of Set operators in SQL.
8. Study of JOIN operators in SQL.
10. Study of functions in SQL.

**B. Sc. – III [Computer Science] Semester V**  
**Course: Programming in C#.net**  
**Course Code: U-COS-542**  
**DSEE-II**  
**Paper-X A**

**Teaching Hours : 45**

**Marks : 50**

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**Learning Objectives**

1. Working With Visual Studio
2. Designing Forms
3. Write Code, Database Connectivity

**Course Outcome:**

After successfully completion of this course, students should be able to –

1. Handle Visual Studio
2. Design form with menus, controls and write code
3. Work with Advance Controls
4. Connect Front End with Back End
5. Perform DML Operation

**Unit I: Introduction to .net, Arrays & Operators**

**[10 hrs]**

What is .net, .net Framework, CLR , Visual Studio.net & .net Languages Integrated Development Environment , Project types , c#.net History & design Goals , How c# differs from java , I/O Statement with C#.net , Boxing & Unboxing , Short Circuiting Operator , Array & ArrayList class, Jagged Array , Hash Table , String Class

**Unit II: Properties, Error Handling & Namespaces**

**[10hrs]**

Properties & its type , Event , Delegate & Multicast Delegate , Thread , Exception handling , using keyword, creating and using namespaces, interface , Method overloading & method overriding , Partial Class

**Unit III: GUI Programming (Windows Application)**

**[13hrs]**

Event Driven Programming, Building windows application with visual studio  
TextBox, Label & Button Control, Combo Box, List Box, Check Box & Group Box Control  
DateTimePicker , Timer Control, Tree View , Building Menu , MDI Form , Picture Box,  
Progress Bar Control , Common Dialog boxes , Introduction to WPF

## **Unit IV: Database Programming**

**[12hrs]**

How ADO.NET differs from ADO, Advantages of ADO.NET, Connected & Disconnected Architecture, DataSet, Data Reader & Data Adapter  
Managed Data Providers, Data Grid View Control, Developing ADO.NET Based Application  
Insert, Update & Delete operation on table, Filling the DataSet

### **Reference Books:-**

1. Programming in C# A Primer - Second Edition By - E Balagurusamy
2. C#.Net Programming Wrox Publication
3. .NET 4.0 programming black book by KOGENT LEARNING SOLUTIONS INC.
4. C# 2010 programming black book by KOGENT LEARNING SOLUTIONS INC.

**B. Sc. – III [Computer Science] Semester V**  
**Course: Programming in C#.net**  
**Course Code: U-COS-544**  
**DSEEP-VIII**

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**Learning Objectives:**

1. Working With Visual Studio
2. Designing Forms
3. Write Code, Database Connectivity

**Course Outcome:**

After successfully completion of this course, students should be able to –

1. Handle Visual Studio
2. Design form with menus, controls and write code
3. Work with Advance Controls
4. Connect Front End with Back End
5. Perform DML Operation

**Practical List:-**

1. Introduction to Visual Studio.net
2. Console application for I/O statement
3. Console application for each loop with Array class
4. Console application for Hash Table
5. Console application for Read Write properties
6. Console application for Exception Handling
7. Console application to demonstrate Thread
8. Windows application for MDI form
9. Windows application to create Menus
10. Windows application to show Message Box in different type
11. Windows application to perform Addition of two Text Box
12. Windows application to work with Combo Box
13. Windows application to work with List Box
14. Windows application to work with Progress Bar and Timer
15. Windows application to demonstrate Dialog Box
16. Windows application to work with Tree View
17. Windows application to connect with MS-Access
18. Windows application to connect with Oracle
19. Windows application to Perform DML operation on Table
20. Windows application to show database record in Data Grid View



**B. Sc. – III [Computer Science] Semester V**  
**Course: Programming in VB.NET**  
**Course Code: U-COS-542**  
**DSEE-II**  
**Paper-X B**

Teaching Hours: 45

Marks: 50

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**Learning Objectives:**

1. The student will use Visual Basic.Net to build Windows applications using structured and object-based programming techniques.
2. Students will be exposed to the following concepts and skills
3. Analyze program requirements
4. Design/develop programs with GUI interfaces
5. Code programs and develop interface using Visual Basic .Net
6. Perform tests, resolve defects and revise existing code

**Course Outcomes:**

After successfully completion of this course, students should be able to –

1. Students will understand .NET Framework and describe some of the major enhancements to the new version of Visual Basic.
2. Students will describe the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE)
3. Students will create applications using Microsoft Windows Forms
4. Students will create applications that use ADO. NET

**Unit I: Introduction to .Net Technology and Visual Basic.Net IDE [13hrs]**

Introduction to .Net , Features of .Net, Advantages of .Net, Net Framework, CLR, CTS, CLS, Creating a project , Types of project in .Net , Exploring and coding a project, **Solution explorer** - toolbox, properties window, Output window, Object Browser.

**Unit II : Programming with VB.Net and Understanding Console Application [10hrs]**

Variables, constants, operators, Data types ,working with string, Methods.  
Control statements: Making decisions, if statement, Select case, Loops

MsgBox and Input Box , Classes and Objects , Access Specifiers: Private, Public and Protected , Building Classes , Constructors , Inheritance types , Overloading and Overriding.

### **Unit III : GUI Programming**

**[13 hrs]**

Introduction to Window Applications, Using Form – Properties, Methods and Events , Interacting with controls - Textbox, Label, Button, Listbox, Combobox, Checkbox, Picture Box, Radio Button, GroupBox, Timer, toolbar, Progress Bar, Common Dialog Controls (Save, Open, Font, Color).

### **Unit IV: Introduction to ADO.Net**

**[9hrs]**

Connected and disconnected Object Model  
Creating Connection, Command, Data Adapter, Data Reader and Data Set with OLEDB, Insertion and Updating with table.

#### **Reference Books**

1. VB.Net programming Black Book, by Kogent Learning Solutions, 2. Wiley India VB.Net Step By Step, Michael Halvorson, PHI.
3. Mastering VB.Net, EvangelosPetroutsos,
4. Wiley Publications Beginning VB.Net (Wrox)

**B. Sc. – III [Computer Science] Semester V**  
**VB.NET**  
**Course: Lab Course VII**  
**Course Code: U-COS-544**  
**DSEEP-VIII**

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**Learning Objectives:**

1. The student will use Visual Basic.Net to build Windows applications using structured and object-based programming techniques.
2. Design/develop programs with GUI
3. Code programs and develop interface using Visual Basic .Net

**Course Outcomes:**

After successfully completion of this course, students should be able to –

1. Understand .NET Framework and describe some of the major enhancements to the new version of Visual Basic.
2. Understand the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE)
3. Create applications using Microsoft Windows Forms.
4. Create an application that contains use of ADO. NET

**Practical List**

1. Study of Integrated development environment in vb.net.
2. Study of project types in vb.net
3. Creating a project in VB.NET
4. Study of form with its all properties and methods.
5. Programs to demonstrate textbox, label and command buttons
6. Programs to demonstrate InputBox and MsgBox.
7. Programs to demonstrate Operators in vb.net using different controls.
8. Programs to demonstrate if-else, elseif and switch statements in vb.net.
9. Programs to demonstrate lopping statements in vb.net.
10. Programs to demonstrate listbox.
11. Programs to demonstrate ComboBox.
12. Programs to demonstrate string handling functions.
13. Programs to demonstrate database connectivity.

**Semester: V**  
**Skill Enhancement Course**  
**(Web Page Designing)**  
**SECCOS-3**

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**Course Outcomes:**

After successfully completion of this course, students should be able to –

- Design basic programming structures to implement functionality in line with requirements defined in BRS/URS, SRS and HLD.
- Establish and agree with appropriate people the data/information they need to provide, the formats in which they need to provide it, and when they need to provide it, Obtain the data/information from reliable sources, Check that the data/information is accurate, complete and up-to-date.

**Unit I Introduction to HTML5**

Formatting text by using tags, Using lists and backgrounds.

Creating hyperlinks and anchors, Creating tables, creating simple table, specifying the size of the table, specifying the width of the column, merging table cells, using tables for page layout, Formatting tables, applying table borders, applying background and foreground fills, changing cell padding, spacing and alignment, creating user forms creating basic form, using check boxes and radio buttons creating lists, additional input types in HTML5, Incorporating sound and video, Audio and video in HTML5, HTML multimedia basics, embedding video clips, incorporating audio on web page, Image Mapping.

**Unit II CSS3**

Introduction to CSS, how does CSS work? Syntax, identification and grouping of elements, selectors, colors, background, fonts, text, links, lists, tables. CSS Box model, Margin, Padding, Border, height and width, floating elements, positioning of elements, align, dropdowns, navigation bar, counters, Image gallery.

**Unit III Java Script, Bootstrap**

Introduction to Client Side Scripting, Introduction to Java Script, JavaScript Types, Variables in JS, Operators in JS, Conditional statements, Java Script Loops, JS Popup Boxes, JS Events, JS Arrays, Working with Arrays, JS Objects, JS Functions, Document and its associated objects, Document, Link, Area, Anchor, Image, Applet, Layer Events and Event Handlers, Using Java Script in Real-time, Validation of Forms.

What is Bootstrap?

Basic Bootstrap Pages, Bootstrap Grid System, Grid Classes, and Basic Structure of a bootstrap Grid, Equal Columns, and Unequal Columns.

Typography, Table, Images, Wells, Alerts Button, Button groups, Badges/Labels Progress Bars, Pagination, pager, List groups, Panels, Drop Down, Collapse, Tabs/Pills, Navbars

## **Unit IV Development of Website**

### **Reference Books:**

- 1) Start Here Learn HTML5, FaitheWempen, Microsoft Publication
- 2) HTML and CSS Design and Build Websites, John Duckett, Willy Publications
- 3) JavaScript 2.0: The Complete Reference, Second Edition by Thomas Powell and FritzSchneider
- 4) Internet & Web Development, Soma Das Gupta, Khanna Publishing House

**B. Sc. – III [Computer Science] Semester VI**  
**Course: Web Programming using PHP and MySQL –XI**  
**Course Code: U-COS-641**  
**DSEE-I**  
**Paper-XI**

**Total Teaching Hours: 45**

**Total Marks: 50**

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**Learning Objective:-**

1. Learn Designing of Web Pages.
2. writing PHP code
3. JoinHTML with PHP,
4. Testing application on Browsers,object oriented programming with php,MySql Connectivity etc.

**Course Outcome:-**

After successfully completion of this course, students should be able to –

1. Student should design Web Pages.
2. Writing HTML page with PHP Code.
3. Runweb page on various browsers.
4. Createphp classes.
5. Works with different php classes.
6. Performdatabase connectivity with Mysql
7. Student can get job of PHP web developer or web designer.

**UNIT- I: PHP Basic and Programming Constructs.**

**[10hrs]**

HTTP basics, Introduction to Web server and Web browser,  
Introduction to PHP, advantages of PHP.

PHP syntax, Variables, Constants, print/Echo Data types, Strings, Constants,while,  
For, Operators and Expressions, if-else , else if, Switch statement, Break and Continue.

**UNIT- II: Function & Arrays**

**[13hrs]**

Defining and calling a function, Default parameters, Variable parameters, Variable function, Types of strings in PHP, Printing functions, Encoding andescaping, Comparing strings, Manipulating and searching strings, Regularexpressions , Indexed Vs Associative arrays, Multidimensional arrays, Converting between arrays and variables, Traversing arrays, Using arrays, Functions:count, list, in array, current, next, previous, end, each, sort, rsort, assort, array\_merge,array\_reverse.

## **UNIT- III: OOPs and Forms**

**[12hrs]**

Classes, Objects, Serialization, Inheritance, Interfaces, Encapsulation.  
FORM element, INPUT elements, Validating user input, Passing variables between pages, Passing variables through a GET, Passing variables through a POST, Passing variables through aREQUEST,MVC Architecture.

## **UNIT- IV: My SQL**

**[10hrs]**

Introduction to MySql , Benefits of MySql, reserve words, key words, variables, data types,

**Types of commands** : Data Definition Commands, Data Manipulation Commands, Data Control

**Commands Clauses** : where , order by , group by , having, like , between, Connectivity withPHP.

### **Reference Books :**

1. Programming PHP RasmusLerdorf and Kevin Tatroe O'Reilly publication
2. Beginning PHP 5 Wrox publication
3. PHP and MYSQL O'Reilly publication

### **Web References**

1. [www.php.net.in](http://www.php.net.in)
2. [www.W3schools.com](http://www.W3schools.com)
3. [www.wrox.com](http://www.wrox.com)

**Course: Web Programming using PHP and MySQL -XI**  
**Course Code: U-COS-643**  
**DSEEP-I**  
**Paper-IX**

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**Learning Objectives:**

1. Learn Designing of Web Pages,.
2. writing PHP code, JoinHTML with PHP,
3. testing application on Browsers, object oriented programming with php, MySql Connectivity etc.

**Course Outcome:-**

After successfully completion of this course, students should be able to –

1. Student should design Web Pages.
2. Writing HTML page with PHP Code.
3. Runweb page on various browsers.
4. Create php classes.
5. Works with different phpclasses.
6. Perform database connectivity with Mysql
7. Student can get job of PHP web developer or web designer.

**Proposed Practical List:**

1. HTML code to print Hello on Browser
2. HTML program with Form tag
3. HTML program with Form and Input tag
4. First PHP program
5. Php program for looping
6. Php program for Function
7. Php program for Printing Function
8. Php program for Encoding Function
9. Php program for Escaping Function
10. Php program for Inheritance



**B. Sc. – III [Computer Science] Semester VI**  
**Course: Introduction to Python Programming –XII A**  
**Course Code: U-COS-642**  
**DSEE-II**  
**Paper-XII A**

**Total Teaching Hours: 45**

**Total Marks: 50**

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**Learning objectives:**

1. To acquire programming skills in core Python.
2. To acquire Object Oriented Skills in Python
3. To develop the skill of designing Graphical user Interfaces in Python
4. To develop the ability to write database applications in Python

**Course Outcomes:**

After successfully completion of this course, students should be able to –

1. Explain basic principles of Python programming language.
2. Implement object oriented concepts.
3. Implement database and GUI applications.

**UNIT I: Beginning Python**

**[7 hrs]**

Introduction, History, important features, overview of python and installation. Lexical Matters: Lines, Comments, Names and Tokens, Doc Strings.

**UNIT II: Getting Started**

**[15 hrs]**

Simple Program, Identifiers, Reserved Words, Multi-Line Statements, Operators, variables, assignment, Numbers (int, long, float and complex), Strings. Decision and Looping Statements ,Introduction to decision statement, If Statement, if—else statement, if-elif-else statement. Introduction to Looping statement, while loop, for loop, nesting of loop, break, continue and pass statement.

**UNIT III: Sequence: String, List, Tuples and Error, exceptions [10 hrs]**

Strings, Strings and Operators, String Built-in methods, Lists, List type built-in method, Tuples, Special features of Tuples. What are exceptions?, exceptions in Python, Detecting and handling exceptions, Raising exception, Assertions, Standard exceptions, creating exceptions.

**Unit IV: Functions, Class and OOPs**

**[13hrs]**

What are functions, Calling functions, creating functions, passing functions, formal arguments, positional arguments, default arguments, variable length argument, recursion , Introduction, OOP, Classes, Class attributes, Instances, Instance attribute, building and Method of invocation, Sub classing and derivation, Inheritance, Built-in functions for classes, instances and other objects, Privacy.

**Reference Book:**

1. Core Python Programming – Wesley J. Chun, Printice Hall PTR, First edition.
2. Learning To Program With Python - Richard L. Halterman.

**B. Sc. – III [Computer Science] Semester VI**  
**Course: Introduction to Python Programming**  
**Course Code: U-COS-644**  
**DSEEP-II**  
**Paper-X A**

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**Learning objectives**

1. To acquire programming skills in core Python.
2. To acquire Object Oriented Skills in Python
3. To develop the skill of designing Graphical user Interfaces in Python
4. To develop the ability to write database applications in Python

**Course Outcomes:**

After successfully completion of this course, students should be able to –

1. Explain basic principles of Python programming language.
2. Implement object oriented concepts.
3. Implement database and GUI applications.

**PRACTICAL LIST:**

- 1) Program to demonstrate Constant Variable.
- 2) Program to demonstrate scope of Variable
- 3) Program to demonstrate branching statement
- 4) Program to demonstrate Looping statement
- 5) Program to demonstrate simple class
- 6) Program to demonstrate String class and it's method.
- 7) Program to demonstrate String Buffer and it's method.
- 8) Program to demonstrate inheritance and its Types
- 9) Program to demonstrate recursion.
- 10) Program to demonstrate function

**B. Sc. – III [Computer Science] Semester VI**  
**Course: Software Engineering –XII B**  
**Course Code: U-COS-642**  
**DSEE-II**  
**Paper-XII B**

**Teaching Hours: 45**

**Marks: 50**

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**Learning Objectives:**

1. Knowledge of basic software engineering methods and practices, and their appropriate application.
2. Describe software engineering layered technology and Process frame work.
3. A general understanding of software process models such as the waterfall and evolutionary models.
4. Understanding of the role of project management including planning, scheduling, risk management, etc.
5. Understanding of different software architectural styles.
6. Understanding of approaches to verification and validation including static analysis, and reviews.
7. Understanding of software testing approaches such as unit testing and integration testing.

**Course Outcomes:**

After successfully completion of this course, students should be able to –

1. Basic knowledge and understanding of the analysis and design of complex systems.
2. Apply software engineering principles and techniques.
3. Develop, maintain and evaluate software systems.
4. Perform independent research and analysis.
5. Work as an effective member or leader of software engineering teams.
6. Understand and meet ethical standard s and legal responsibilities

**UNIT I: Software Engineering Fundamentals and Software Process**

**[13hrs]**

Definition of Software ,Software characteristics , Software Applications  
Software Process Models , Waterfall model , Prototyping model ,Spiral model ,  
Incremental model , Concurrent development model  
Project management Concepts: The Management Spectrum - The People, The Product,  
The Process, and The Project.

**UNIT II: Software Process and Project Metrics:**

**[10hrs]**

Measures, Metrics and Indicators,

**Software measurement:** Size - Oriented Metrics, Function - Oriented Metrics,  
Extended Function point metrics, Software Project Planning , Project Planning  
Objectives , Software Project Estimation , Decomposition Techniques - Problem Based  
Estimation, Process Based Estimation , Empirical Estimation Models- The COCOMO  
Model

### **UNIT III: Risk Analysis and Management and Software Quality Assurance**

**[12hrs]**

Software risks, Risk identification, Risk Projection, Risk Refinement  
Risk Mitigation, Monitoring and Management

**Basic concepts-** Quality, Quality Control, Quality Assurance, Cost of Quality  
Software Quality Assurance (SQA) ,Formal Technical Review

### **UNIT IV: Coding and Testing**

**[10hrs]**

Programming principles and guidelines , Incrementally developing code , Managing,  
evolving code , Unit testing , Code inspection , Testing concepts , Testing process  
Black-box testing, White-box testing

#### **Reference Books:**

1. R. Pressman: Software Engineering, McGraw-Hill.
2. K.K. Agrawal and Y. Sing: Software Engineering, New Age International.
3. P. Jalote: Software Project Management

**Course Code: U-COS-644**  
**DSEEP-II**  
**Paper-XII B**

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**Learning Objectives:**

1. Knowledge of basic software engineering methods and practices, and their appropriate application.
2. Describe software engineering layered technology and Process frame work.
3. A general understanding of software process models such as the waterfall and evolutionary models.
4. Understanding of the role of project management including planning, scheduling, risk management, etc.
5. Understanding of different software architectural styles.
6. Understanding of approaches to verification and validation including static analysis, and reviews.
7. Understanding of software testing approaches such as unit testing and integration testing.

**Course Outcomes:**

After successfully completion of this course, students should be able to –

1. Basic knowledge and understanding of the analysis and design of complex systems.
2. Apply software engineering principles and techniques.
3. Develop, maintain and evaluate software systems.
4. Perform independent research and analysis.
5. Work as an effective member or leader of software engineering teams.
6. Understand and meet ethical standards and legal responsibilities

**Practical List:**

1. Study of Problem Statement
2. Study of Process Model
3. Creating a Data Flow Diagram
4. Data Dictionary
5. Computing FP
6. Calculate Efforts
7. Decide Schedule
8. Creating Risk Table
9. Creating Timeline chart
10. Creating Architectural Design
11. Creating Data Design
12. Based on Component Level Design

**Skill Enhancement Course**

**SciLab**

### **1. Overview**

Introduction to Scilab ,  
Installation on Windows & Linux  
Getting Help from Scilab  
Exercise

### **2. Getting Started Scilab**

The console , The editor , Docking , Using exec  
Batch processing

### **3. Basic elements of the language**

Creating real variables , Variable names , Comments and continuation lines  
Elementary mathematical functions , Pre-de\_fined mathematical variables, Booleans ,  
Complex numbers , Integers , Floating point integers , The ans variable , Strings ,  
Dynamic type of variables

### **4. Matrices**

Working with Matrix , Multiplication of two vectors , Comparing two real matrices

### **5. Control & Looping Statement**

The if statement , The select statement , The for statement , The while statement , The  
break and continue statements

#### **Reference :**

1. The Scilab Consortium. Scilab.<http://www.scilab.org>
2. SCILAB (A Free Software To MATLAB) Kindle Edition  
by ACHUTHSANKAR S. NAIR (Author)