

SRM UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF SOFTWARE ENGINEERING

Amendment to 2013-2014 Curriculum and syllabus with effect from 2015-2016 for students admitted in the year 2013-2014 and 2014-2015 was approved by 28th Academic Council Meeting which was conducted on 23.03.2015.

Sl.No	Course Code	Course Name	Semester	Course Type
1	SE1017	Web Programming	VI	Core Course
2	SE1107	Advanced programming Java	V	Elective Course
3	SE1142	Programming Using Python	V	Elective Course
4	SE1143	Big Data Analytics	VI	Elective Course
5	SE1203	Object Oriented Programming	V	Open Elective
6	SE1501	Linux Kernel		1 Credit Course

SE1017	SE1017 -WEB Programming	L	T	P	C
	Total Contact Hours-60	3	0	2	4
	Prerequisite				
	Knowledge of Java Programming is required				
PURPOSE					
To explain internet Programming concepts and related programming with scripting languages and to provide practical knowledge in web programming.					
INSTRUCTIONAL OBJECTIVES					
1	To create a basic website using HTML and Cascading Style Sheets.				
2	To design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms.				
3	To design rich client presentation using AJAX.				
4	To design and implement simple web page in PHP.				

UNIT I USER INTERFACE DESIGN (9 Hours)

Markup Language (HTML): Introduction to HTML and HTML5 - Formatting and Fonts – Commenting Code – Anchors – Backgrounds – Images – Hyperlinks – Lists – Tables – Frames - HTML Forms.**Cascading Style Sheet (CSS):** The need for CSS, Introduction to CSS – Basic syntax and structure -Inline Styles – Embedding Style Sheets - Linking External Style Sheets – Backgrounds – Manipulating text - Margins and Padding - Positioning using CSS.

UNIT II CLIENT SIDE AND SERVER SIDE PROGRAMMING (11 Hours)

Java Script: An introduction to JavaScript–Control statement-Functions-Array-Objects. Servlets: Java Servlet Architecture- Servlet Life Cycle- Handling the client request form data-Session Tracking- Handling Cookies- Installing and Configuring Apache Tomcat Web Server;- DATABASE CONNECTIVITY: JDBC perspectives, JDBC program example - JSP: Understanding Java Server Pages-JSP Standard Tag Library(JSTL)-Creating HTML forms by embedding JSP code.

UNIT III XML and AJAX (9 Hours)

XML:XML and RSS –Introduction-Basics-Structure data-XML Namespaces-DTD-XML Schema documents-Extensible Style Sheet Language and XSLT-RSS-Ajax-Enabled Rich Internet Application-Introduction-Traditional web application Vs Ajax Application-RIA with Ajax-Ajax example using XML Http Request Object.

UNIT IV PHP (9 Hours)

Introduction - How web works - Setting up the environment (LAMP server) - Programming basics -Print/echo - Variables and constants – Strings and Arrays – Operators, Control structures and looping structures – Functions – Reading Data in Web Pages - Embedding PHP within HTML – Establishing connectivity with MySQL database.

UNIT V STRUTS (7Hours)

Struts Architecture - Struts classes - Action Forward, Action Form, Action Servlet, Action classes -Understanding struts - config.xml, Understanding Action Mappings, Struts flow with an example application, Struts Tiles Framework, Struts Validation Framework .

Total :45 Hours

TEXT BOOKS

1. Deitel ,Deitel and Nieto, “Internet and World Wide Web – How to program”,4th Edition, Pearson Education Publishers, 2009
2. Eric Freeman, Elisabeth Robson, “HTML5 Programming”, first edition, O’Reilly Publishers, 2011.
3. Marty Hall, “Core Servlet &Java Sever Pages”, Sun Microsystems
4. Steven Holzner, “The Complete Reference - PHP”, Tata McGraw Hill, 2008
5. James Holmes “Struts: The Complete Reference, " 2nd Edition 2007 McGraw Hill Professional.

REFERENCES

1. Mike Mcgrath, “PHP & MySQL in easy Steps”, Tata McGraw Hill, 2012.
2. Patrick Naughton, “COMPLETE REFERENCE: JAVA2”, 7th edition,Tata McGraw-Hill, 2010.
- 3.Thomas A powell,”The complete reference HTML & CSS”,5th Edition.

PRACTICALS

(15 hours)

Students are asked to create a dynamic website and implement the following concepts

(ex: creating website for ABC Restaurant)

1. Create a web page with the following using HTML5
 - i) To embed an image map in a web page
 - ii) To fix the hot spots
 - iii)Show all the related information when the hot spots are clicked.
2. Create a web page with all types of Cascading style sheets.
3. Create a web page and perform the validation using DHTML
4. Create a dynamic web pages using JSP and Servlet
5. Create dynamic web pages to store and retrieve information using JDBC
6. Create a web page using AJAX,XML Schema
7. Create a web pages to store and retrieve information using PHP,SQL
8. Cretae a simple web page using Struts

SE1017 -Web Programming												
Course designed by		Department of Software Engineering										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	k
		X	X			X						
2	Mapping of instructional objectives with student outcome	1, 2	2, 3			2						4
3	Category	General (G)			Basic Sciences (B)		Engineering Sciences and Technical Arts (E)				Professional Subjects (P)	
											x	
4	Broad area	Software Engineering					Computer Engineering				Knowledge Engineering	
		X					x					
5	Approval	28 th meeting of Academic Council, March 2015										

UNIT V ENTERPRISE APPLICATIONS AND FRAMEWORK (9 Hours)

Server Side Component Architecture –EJB Introduction-EJB Architecture- Session Beans – Entity Beans – Persistent Entity Beans –Java Frameworks-Strut introduction-HIBERNATE

TEXT BOOKS:

1. Eric Armstrong, Jennifer Ball, Stephanie Bodoff “J2EE The Complete Reference” 2005. (UNIT II)
2. Ed Roman, “Mastering Enterprise Java Beans”, John Wiley & Sons Inc., 1999. (UNIT III and UNIT V)
3. Hortsman & Cornell, “CORE JAVA 2 ADVANCED FEATURES, VOL II”, Pearson Education, 2002. (UNIT I and UNIT IV)
4. Mowbray, “*Inside CORBA*”, Pearson Education, 2003.(Unit III)

REFERENCES:

1. Web reference: <http://java.sun.com>.
2. Patrick Naughton, “COMPLETE REFERENCE: JAVA2”, Tata McGraw-Hill, 2003.

SE1107 - ADVANCED JAVA PROGRAMMING													
Course designed by		Department of Software Engineering											
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k	
		x	x	x		x	x	x	x	x	x		
2	Mapping of instructional objectives with student outcome		1,3	5		3					2,3	1,4	1,4
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)		Professional Subjects (P)				
									X				
4	Broad Area (for courses under ‘P’ only)	Software Engineering		Computer Engineering			Knowledge Engineering						
		X		X									
5	Approval	28 th Meeting of Academic Council, March 2015											

PROGRAMMING USING PYTHON		L	T	P	C
SE1142	Total Contact Hours - 45	3	0	0	3
	Prerequisite				
	Knowledge of C and C++ Programming is required				
PURPOSE					
To Familiarize the students with the fundamentals and programming basics of Python Language					
INSTRUCTIONAL OBJECTIVES					
This course introduces the students to					
1.	To Understand data types (like character strings, integers, and real numbers)and the Operations that can be Applied to each data type.				
2.	To Write programs that get input, perform calculations, and provide output (using Conditional logic, loops, Functions).				
3.	To Write well designed and well documented programs that are easily maintainable.				
4.	To Test and debug programs (find out what is wrong and fix it).				
5.	To Enjoy the art and science of computer programming.				

UNIT-1 BASICS OF PYTHON

(9 hours)

Entering and Storing Data- Binding Values to Names- More Python Syntax Basics- Reading and Converting User Input. Making Decisions- Conditions in Python- Making Decisions: Simple if Statements.-Multiple Choice Decisions.

UNIT-II ITERATION AND LISTS

(9 hours)

Iteration: For and While Loops- Terminating the Current Iteration. — Sequence Containers: Lists and Tuples- Writing Lists and Tuples- Accessing Sequence Values- Manipulating Lists and Tuples.

UNIT-III SETS AND DICTS

(9 hours)

Sets and Dicts- Creating Sets- Working With Sets- Working with Dicts- Applying Dicts: Counting Words.

UNIT-IV FORMATTING

(9 hours)

String Formatting- The format() Method- Function Arguments- Format Field Names- More About Looping-- Fun with the range() function- While Loops and User Input Validation.

UNIT-V FILES

(9 hours)

Reading and Writing Files- Creating a New File- Writing to a File- Reading Files as Text, Python's Built-In Functions- abs(x)- bool(x)- chr(i), The Python Standard Library- Namespaces- Python Modules.

Text Books

1. Introduction to Programming Using Python, First Edition by Y. Daniel Liang,©2013 Prentice Hall
2. Dawson, Michael. Python Programming for the Absolute Beginner (3rd ed.). Boston, MA: Course Technology, 2010.

REFERENCE BOOKS:

1. Shaw, Zed A., 2012. Learn Python the Hard Way, Second Edition, Shavian Publishing, LLC, 183 p

SE1142 - PROGRAMMING USING PYTHON												
Course designed by		Department of Software Engineering										
1.	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		x	x								x	x
2.	Mapping of instructional objectives with student outcome	1,2	3,4								5	6
3.	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
										X		
4.	Broad Area (for courses under 'P' only)	Software Engineering		Computer Engineering			Knowledge Engineering					
		X		X								
5.	Approval	28 th meeting of Academic Council, March 2015										

SE1143	BIG DATA ANALYTICS	L	T	P	C
	Total Contact Hours - 45	3	0	0	3
	Prerequisite				
	Database Management Systems				
PURPOSE					
The objective of this course is to explore, design, and implement basic concepts of big data & analytics methodologies for analyzing structured and unstructured data with emphasis on the relationship between the Data Scientist and its application to the business needs					
INSTRUCTIONAL OBJECTIVES					
1.	To work with big data platform				
2.	To analyze the HADOOP and Map Reduce technologies associated with big data				
3.	To explore on Big Data applications Using Pig and Hive				
4.	To understand the fundamentals of various big data analysis techniques				
5.	To use software tools such as R and Hadoop, in-database analytics				

UNIT I INTRODUCTION TO BIG DATA

(9hours)

Introduction to BigData Platform – Challenges of Conventional Systems - Nature of Data-Evolution Of Analytic Scalability - Intelligent data analysis- Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

UNIT II MINING DATA STREAMS

(9hours)

Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT III INTRODUCTION TO BIG DATA ANALYTICS & R PROGRAMMING

(9hours)

Analyzing, Visualization and Exploring the Data, Statistics for Model Building and Evaluation, Introduction to R and RStudio, Basic analysis in R, Intermediate R, Intermediate analysis in R, Advanced Analytics - K-means clustering, Association rules-Speedup, Linear Regression, Logistic Regression, Naïve Bayes, Decision Trees, Time Series Analysis, Text Analysis

UNIT IV HADOOP

(9hours)

History of Hadoop- The Hadoop Distributed File System – Components of HadoopAnalyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFSBasics- Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features

UNIT V FRAMEWORKS

(9hours)

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper - IBM InfoSphere BigInsights and Streams. Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications

TEXT BOOKS

1. Prajapati, Big Data Analytics with R and Hadoop, 2014
2. Stephan Kudyba, Big Data, Mining, and Analytics: Components of Strategic Decision Making, Auerbach Publications, March 12, 2014 .
3. Michael Minelli (Author), Michele Chambers (Author), Ambiga Dhiraj (Author) , Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses,Wiley Publications,2013

REFERENCES

1. Dr. Mark Gardener, Beginning R: The Statistical Programming Language (Wrox), 2013
2. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2012.
3. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012.
4. Pete Warden, "Big Data Glossary", O'Reilly, 2011.
5. Zikopoulos, Paul, Chris Eaton, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, Tata McGraw Hill Publications, 2011
6. Tom White " Hadoop: The Definitive Guide" Third Edition, O'reilly Media, 2012.
7. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHill Publishing, 2012

SE1143 - BIG DATA ANALYTICS												
Course designed by		Department of Software Engineering										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
			X							X		X
2	Mapping of instructional objectives with student outcome		1 - 2							5		3 - 4
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
												x
4	Broad Area (for courses under 'P' only)	Software Engineering		Computer Engineering			Knowledge Engineering					
		X		X			X					
5	Approval	28 th meeting of Academic Council, March 2015										

SE1203	OBJECT ORIENTED PROGRAMMING	L	T	P	C
	Total Contact hours - 45	3	0	0	3
	Prerequisite				
	Nil				
Purpose					
To provide a comprehensive introduction to Object Oriented Programming (OOP) uses c++, Java and c# programming language. This course aims to teach OOP concepts, such as classes, interfaces, inheritance, and polymorphism.					
INSTRUCTIONAL OBJECTIVES					
1	The Student will able to understand the Basics object-oriented programming concepts				
2	The Student will able to understand and apply the object oriented concept like Classes and Objects, encapsulation, Inheritance, Polymorphisms in C++				
3	The Student will able to understand java environment and its features				
4	The Student will able to understand and apply the object oriented concept like Classes and Objects, encapsulation, Inheritance, Interface, Polymorphisms in java				
5	The Student will able to understand C# environment and the differences with C++ and Java				

UNIT I - INTRODUCTION TO OBJECT ORIENTED PROGRAMMING WITH C++

(9 hours)

Introduction to C++ - Object-Oriented Programming Concepts - Review of constructs of C used in C++: Basic Language Elements, control structures, input and output statement, structure, unions, functions, pointers and arrays, preprocessor directives - Classes and Objects : Object Scope, Data Abstraction, Enforcing Data Encapsulation, 'this' Pointer, Dynamic creation of objects - Constructors and Destructors : The Default Constructor, The Destructor, Parameterized Constructors, Copy constructor.

UNIT II - EXTENDING CLASSES AND INHERITANCE IN C++

(9

hours)

Defining member functions, Methods and access modifiers, Accessing class data and methods, Friend class and friendly functions, Returning objects, Arrays of Objects - Function and Operator Overloading : Function Overloading, Operator overloading - using friend function, Dealing with strings using operators, Converting data types, Inheritance, Virtual functions and Polymorphism, Templates, Exception Handling

UNIT III - INTRODUCTION TO JAVA

(9

hours)

Java Fundamentals - The Java Environment, Java's Key Features, Java virtual machine, Basic Language Elements - The First Application - The 'Classpath' in Java, Java Archives - Java Classes : Classes &

Packages, The 'import' Statement, The Importance of Encapsulation, Java Constructors, Access Modifiers (private, default and public), Method Overloading

UNIT IV - EXTENDING JAVA CLASSES

(9

hours)

Polymorphism and Inheritance, the 'Protected' Modifier, Using 'this' and 'super', The 'final' keyword, Static Members & Methods - Interfaces & Abstract Classes, The Complete Construction Process, The Class 'Object', Nested Classes, Enums in Java - Exception handling

UNIT V - INTRODUCTION TO C#

(9 hours)

Introduction to C # : Evaluation of C#, characteristics of C#, application of C#, difference between C++, Java and C# - Introduction to C# environment - Overview of C#: Programming structure of C#, Basic Language Elements, The First Application - Classes: Classes as Structured Data, Methods - Constructors and Initialization - Methods: Method Overloading - Inheritance - Virtual Methods and Polymorphism - Exceptions – Interfaces.

EXERCISE PROGRAMS

1. Design C++ classes with static members, methods with default arguments, friend functions and Function Overloading in c++
2. Operator Overloading with and without friend function : +, -, ++, --, >>, << in c++
3. Develop a template of linked-list class and its methods in c++
4. Define stack and queue class with necessary exception handling in c++
5. Simple java program for method overloading, exception handling and Access Specifiers
6. Inheritance and Interface in Java
7. Constructor and Constructor overloading in java
8. Overriding in java
9. Simple program in c# with constructor, method, exception
10. Polymorphism and interface in c#

TEXT BOOKS

1. E Balagurusamy, "Object Oriented Programming Using C++ and JAVA", McGraw-Hill Education, 2012.
2. Herbert Schildt, "C# 4.0: The Complete Reference", McGraw-Hill Education, 2010.

REFERENCES

1. Herbert Schildt, "C# 3.0: A Beginner's Guide", McGraw-Hill Education, 2009.
2. Ramesh Vasappanavara et al, "Object-oriented Programming Using C++ and Java", First Impression, Pearson, 2011.
3. Dan Clark, "Beginning C# Object-Oriented Programming", Apress, 2011.

4. Ira Pohl, "Object-Oriented Programming Using C++", 2/e, Pearson Education, 2006

5. Thomas Wu, "An Introduction to Object-Oriented Programming with Java", 5th Edition, McGraw-Hill Education, 2009.

SE1203 - Object Oriented Programming												
Course designed by		Department of Software Engineering										
1	Student Outcome	a	b	c	d	e	f	g	h	i	j	k
		x	x									x
2	Mapping of instructional objectives with student outcome	2,3	1,3									5
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P) x		
4	Broad Area (for courses under 'P' only)	Software Engineering		Computer Engineering			Knowledge Engineering					
		x		X								
5	Approval	28 th meeting of Academic Council, March 2015										

SE1501	LINUX KERNEL	L	T	P	C
	Total Contact Hours - 15	1	0	1	1
	Prerequisite				
	OS Basics ,C programming, Data Structures and Algorithms, Algorithmic Complexity Analysis				
PURPOSE					
The objective of this course is to explore, design, and implement basic concepts of Linux kernel. This course allows the student to configure, compile and install a Linux kernel from scratch.					
INSTRUCTIONAL OBJECTIVES					
1.	To work with Linux platform				
2.	A deeper understanding of core OS concept, mutual exclusion, virtual memory and scheduling.				
3.	Good understanding about the various mechanism for the Linux environment				
4.	To program a wide variety of applications using Linux system calls and Library functions.				
5.	Allows the students to develop driver programs and kernel programs on Linux system core.				

COURSE OUTLINE

1. Overview of course and logistics
2. Overview and introduction
 - a. OS, Modern OS, Processes, Files, Memory, Storage, Networking, Linux, History of Linux, Linux applications.
3. Linux Process
 - a. Program versus Process , Process Address space
4. Linux Process Management
 - a. Creation, Execution and Termination
 - b. Linux Process Scheduling
 - i. Priorities , Scheduling policies , Scheduling , CPU Affinity
5. Linux System Calls
6. Understanding / proc file system
7. Interrupts and Interrupt Handling
8. Memory Management
9. Virtual File System
10. Compiling the Linux Kernel
 - a. Git Basics
 - b. Linux Kernel Configuration
11. New features in latest Kernel Configuration

TEXT BOOKS

1. Daniel P Bovet, Marco Cesati, Understanding Linux Kernel, 3rd Edition, O Reilly Media, 2005.
2. Robert Love, Linux Kernel Development, 3rd Edition, Addison-Wesley Professional, 2010.

SE1501 - LINUX KERNEL												
Course designed by		Department of Software Engineering										
1	Student Outcome	a	b	c	d	e	f	g	h	I	j	k
			X			X				X		
2	Mapping of instructional objectives with student outcome		1 - 2			3-4				5		
3	Category	General (G)		Basic Sciences (B)			Engineering Sciences and Technical Arts (E)			Professional Subjects (P)		
										x		
4	Broad Area (for courses under 'P' only)	Software Engineering		Computer Engineering			Knowledge Engineering					
		X		X								
5	Approval	28 th meeting of Academic Council, March 2015										