Structure for Second Year Engineering (Computer Science) from Academic Year 2017- 18

Semester- I

Sr. No	Code	Subject	Contact Period (Hrs.)			Credits	Continuous Evaluation in terms of Marks						
			L	T	P		Class Test I	Class Test II	TA	ESE	TW	PR	Total
1	MA2001	Engineering Mathematics - III	4	-	-	4	15	15	10	60	-		100
2	HS2001	Environmental Studies	4	-	-	4	15	15	10	60	-		100
3	CS2001	Object Oriented Programming	3	-	-	3	15	15	10	60	-		100
4	CS2002	Database Management System	3	1	-	4	15	15	10	60	-		100
5#	CS2003	Engineering Science(DMS)	2	1		3	15	15	10	60	-		100
6		Group Discussion/NSS/NCC(Non Credit)	-	-	-	-	-	-	-	-	-		-
7	CS2004	Lab Database Management System	-	-	2	1		-	-	-	25	25	50
	CS2005	Lab Object Oriented Programming			2	1					25	25	50
8	CS2006	Lab Adv C & C++	-	-	2	1		-	-	-	25	25	50
9	CS2007	Lab Web Technology			2	1					25	25	50
		Total	**16**	**2**	**8**	**22**	**75**	**75**	**50**	**300**	**100**	**100**	**700**

Semester- II

Sr.No	Code	Subject	Contact Period (Hrs.)			Credits	Continuous Evaluation in terms of Marks						
			L	T	P		Class Test I	Class test II	TA	ESE	TW	PR	Total
1	CS2008	Data Structure	3	1	-	4	15	15	10	60	-		100
2	CS2009	Computer Organization	4	-	-	4	15	15	10	60	-		100
3	CS2010	Microprocessor & Interfacing	3	1	-	4	15	15	10	60	-		100
4	CS2011	Engineering Science(OSST)	1		2	2					25	25	50
5*		Open Elective -I	3	-		3	15	15	10	60			100
6 #	CS2012	Lab Adv Web Technology	1	-	2	1	-	-	-		25	25	50
7		Technical English(Non Credit)	-		-	-		-	-	-	-	-	-
8	CS2013	Lab Data Structure	-		2	1		-	-	-	25	25	50
9	CS2014	Lab Microprocessor & Interfacing	-		2	1		-	-	-	25	25	50
10	CS2015	Lab Java Programming	1		4	2		-	-	-	50	50	100
		Total	**16**	**2**	**8**	**22**	**60**	**60**	**40**	**340**	**125**	**125**	**700**
		Grand Total	**32**	**4**	**16**	**44**	**135**	**135**	**90**	**640**	**225**	**225**	**1400**

L = Lecturer, **T** = Tutorial, **P** = Practical, **TA** = Teacher Assessment, **ESE** = End Semester Examination

CS2001 : Object Oriented Programming

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs/Week	Test 1	15 Marks
		Test 2	15 Marks
		Teacher Assessment	10 Marks
Total Credits	3	End-Semester Examination	60 Marks

Total Hours required for this course: 60 Hours.

Prerequisites: CS244:Programming Language

Course Description: This course presents a conceptual and practical introduction to imperative and object oriented programming, exemplified by Java. As well as providing grounding in the use of Java, the course will cover general principles of programming in object oriented frameworks. This course introduces concepts like Exception handling, interfaces & multithreading which provides real time programming approach in object oriented programming.

Course Objectives:

- To identify issues related to the definition, creation and usage of classes, objects and methods.
- To discuss the principles of inheritance and polymorphism and demonstrate through problem analysis assignments how they relate to the design of methods, abstract classes and interfaces.
- To provide the foundation of good programming skills by discussing key issues to the design of object-oriented software, including programming design patterns.

Course Outcomes:

After completion of this course students will be able to:

CO1: Define the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading. K1

CO2: Identify classes, objects, members of a class and the relationships among them needed for a specific problem.K2

CO3:Use OOP concepts like inheritance, Interface & package in real time situations.K3

CO4: Identify situations for exceptions and multithreading &incorporate in program.K2

CO5: Develop Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, multithreading, error exception handling)K3

Detailed Syllabus:

UNIT 1	**Introduction :** Difference between OOP and other conventional programming – advantages and disadvantages. An overview of OOP concepts: Class, object, message passing, inheritance, encapsulation, polymorphism. Importance of Java in the internet, Java applets and applications, security, portability, the byte code. An overview of Java, OOP, Two paradigms, abstraction, the three OOP Principles. **Data Types, Variable and arrays :** Simple types, integers, floating point types, characters, Booleans, variables – declaring variable, dynamic initialization, the scope and life time of variables, type conversion and casting, arrays-one dimensional arrays and multi dimensional arrays. **Operators and control statements :** Arithmetic operators, bitwise operators, relational operators, logical operators, assignment operators, ternary operators, operator precedence. Control statements – if, switch, while, do-while, for nested loops, break, continue. All	

	with examples.	
Unit 2	**Classes and Object:** Class fundamentals, declaring objects, assigning object references variables, introducing methods, constructors, overloading method, using objects as parameters, argument passing, returning objects, recursion, use of static and final key word, nested and inner class, using command line arguments. Operator Overloading, Friend Function	
Unit 3	**Inheritance & reusability** Inheritance – basics, using super, creating a multi-level hierarchy, when constructor are called, method overriding, dynamic method dispatch, using abstract classes, using final with inheritance, Wrapper classes. packages, defining a package, use of CLASSPATH, package example, access Protection, importing packages, Interfaces – defining an interface, implementing interfaces, applying interfaces, variables in interfaces, extending interfaces.	
Unit 4	**Exception Handling & Multithreading :** Fundamentals, exception types, uncaught exception, using try and catch, multiple catch clauses, nested try statements, throw, throws, finally, Java's built in exception, creating exception subclasses, using exception. Basics of multithreading, main thread, thread life cycle, creation of multiple threads, thread priorities, thread synchronization, interthread communication, deadlocks for threads, suspending & resuming threads.	
Unit 5	**Input/output :** Java I/O classes and Interfaces, File – directories, using filename filter, the stream classes, the byte streams-input stream, output stream, file input stream, file output stream, byte array in put stream, byte array output stream, random access files. The character streams-Reader, Writer, FileReader, FileWriter, char ArrayReader, CharArrayWriter, BufferedReader, BufferedWriter. Serialization, Serialiabel, Externalizable, Object Output,Object Output Stream, Object Input, Object Input Stream.	

TEXT BOOKS:

1. Patrick Naughton, Herbert Schildt – "The complete reference-Java2" – TMH
2. E. Balagurusamy – " Programming With Java: A Primer" – 3rd Ed.2000 – TMH

REFERENCE BOOK:

1. Deitel and Deitel – "Java How to Program" – 6th Ed. – Pearson
2. Aaron Walsh and John Fronckowiak, " Java Programming Bible",IDG Books, 1st Edition, 2000, India.

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		M	M		H			H			H	
CO1		M	M									
CO2		M	M									
CO3		M	M									
CO4		M	M									

CO5					H			H			H	

H – High M – Medium L - Low

Teacher's Assessment: Teachers Assessment of 20 marks is based on one of the / or combination of few of following

1) Question answer based Theoretical Assignment
2) " Think More Write Less" Based (observation based) Assignment
3) Power point presentation of Topic which is related but out of syllabus
4) Class room Question & answer
5) Overall approach towards learning, creativity.

Assessment Pattern

Assessment Pattern Level No.	Knowledge Level	Test	Teachers Assessment/ Assignment	End Semester Examination
K1	Remember	10	05	15
K2	Understand	10	10	25
K3	Apply	00	05	20
K4	Analyze	00	00	00
K5	Evaluate	00	00	00
K6	Create	00	00	00
Total Marks 100		20	20	60

Assessment table

Assessment Tool	K1	K2	K3	K2	K3
	C01	C02	C03	CO4	CO5
Class Test (20 Marks)	10	10	00	00	00
Teachers Assessment (20 Marks)	05	00	00	10	05
ESE Assessment (60 Marks)	15	20	10	05	10

Special Instructions if any: Nil

Designed by

- Mrs. Pallavi V.Kulkarni
- Mrs. Meghana B. Nagori

CS2002: Database Management System

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs/Week	Test 1	15 Marks
		Test 2	15 Marks
Tutorial	1 Hr/Week	Teacher Assessment	10 Marks
Total Credits	4	End-Semester Examination	60 Marks

Total Hours required for this course: 40 Hours.
Prerequisites: Data Structures and Programming Language

Course Educational Objectives:

- To learn and understand various database concepts such as Relational Database Design, Relational Query Language, Database Architecture and Database Applications
- To familiarize the students with the concept of normalization of database, file organization and indexing method including B and B+ trees
- To understand the use of Structured Query Language (SQL) and learn SQL syntax to create normalized relational database
- To familiarize with the basic issues of transaction processing and concurrency control.
- To familiarize with NoSQL databases such as MongoDB

Course Outcomes:

After completion of this course students will be able to:

CO1: Apply the basic concepts of relational data model, ER model, relational database design and database query language SQL

CO2: Design and convert E-R diagrams into database tables that satisfies relational theory and provides users with queries, forms, and reports

CO3: Design a relational database, analyze it and improve the database design by normalization

CO4: Demonstrate knowledge of ACID properties of a transaction and several techniques of concurrency control

CO5: Develop database for any real time application considering various design constraints and compare SQL and NoSQL

Detailed Syllabus:

UNIT 1	**Introduction to Database Management System**
	Basic terminologies: Data, Database, Database Management System (DBMS), History of Database Systems, Purpose of Database Systems, Characteristics of Database approach, Comparison of database system and file system, Data models, Schemas and instances, Three-schema architecture and data independence, Database users and administrators, Database applications Entity-Relationship Model, Mapping Constraints, Keys,Strong and Weak Entity types, Refining the ER Design,ER Design Issues,ER Diagrams, Reduction of ER diagram to tables, Generalization, Specialization and Aggregation , Extended Entity Relationship Model (EER),
UNIT 2	**Relational Model and SQL**
	Structure of Relational Databases,Database schema, Relational Database Design Using ER-to-Relational Mapping, Mapping EER Model Constructs to Relations, Relational Query Language, Relational Algebra, Tuple Relational Calculus, Domain Relational Calculus SQL Overview, SQL Data Definition and Data Types, Types of SQL commands- DDL, DML, DCL, TCL, Integrity Constraints, SQL operators, Set operations, Null values, Aggregate functions, Nested and Complex queries, Views, Joins,PL/SQL Overview, Structure of PL/SQL program, Cursors, Stored procedures and functions, Triggers Concept of NoSQL Database, NoSQL using MongoDB, Comparative study of SQL and NoSQL

Unit 3	**Relational Database Design**
	Features of good Relational Database Design, purpose of Normalization for Relational Databases, Functional Dependencies, Decomposition: lossless join decomposition and dependency preservation, Normal Forms- First Normal Form, Second Normal Form, Third Normal Form, Boyce-Codd Normal Form, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form
Unit 4	**File Structures, Indexing and Hashing**
	File Organization, Organization of records in files, Basic File Structures, Operations on Files, Indexing Structures for Files, Ordered Indices,Single-Level Ordered Indexes,Multilevel Indexes, B+ Tree index files and B Tree Index files,Hashing Techniques- Static and Dynamic Hashing,Comparison of Ordered indices and hashing, Bitmap indices, Index definition in SQL
Unit 5	**Transactions and Concurrency Control**
	Transaction concept, Transaction States, A simple Transaction Model, Desirable Properties of Transactions, Concept of schedule, serial & non serial schedules, Serializability: conflict & view serializable schedules, uses of Serializability, Recoverable and Non-recoverable schedules Concurrency Control Techniques:Lock based protocols, deadlock handling, Timestamp based protocols, Multiple granularity, Validation based protocols

TEXT BOOKS:

1. Silberschatz , Henry F. Korth , and S. Sudarshan, "Database System Concepts", McGrawHill, Sixth edition
2. Elmasri,Navathe, "Fundamentals of Database Systems", Addison-Wesley ,Sixth Edition

REFERENCE BOOKS:

1. Raghu Ramakrishnan, Johannes Gehrke,"Database Management Systems", McGrawHill ,Third Edition
2. Thomas M. Connolly, Carolyn E. Begg, "Database Systems: A Practical Approach to Design, Implementation and Management", Addison Wesley,fifth Edition
3. Dr. P. S. Deshpande, "SQL and PL/SQL for Oracle 10g", Black Book, Dreamtech Press
4. C. J. Date "Introduction to Database Systems", Addition Wesley, Seventh Edition
5. AtulKahate,"Introduction to Database Management System ", Third Edition, Pearson Education
6. MongoDB: The Definitive Guide by Kristina Chodorow

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				H								
CO2	H											
CO3				M						H		
CO4	H											
CO5												

H – High M – Medium L - Low

Teacher's Assessment: Teachers Assessment of 20 marks is based on thefollowing :-

1) Assignment
2) PowerPointPresentation
3) Quiz/Multiple choice questions test

Assessment Pattern

Assessment	Knowledge Level	Test	Teachers	End Semester

Pattern Level No.			Assessment/ Assignment	Examination
K1	Remember	10	05	20
K2	Understand	10	05	20
K3	Apply	00	05	10
K4	Analyze	00	05	10
K5	Evaluate	00	00	00
K6	Create	00	00	00
Total Marks 100		20	20	60

Assessment table

Assessment Tool	K1	K2	K3	K4
	CO1	CO2,CO3	CO4	CO5
Class Test (20 Marks)	10	10		
Teachers Assessment (20 Marks)	05	05	05	05
ESE Assessment (60 Marks)	20	20	10	10

Special Instructions if any: Nil

Designed by
Prof. Charudatt M. Mane

CS2003: Discrete Mathematical Structure

Teaching Scheme		Evaluation Scheme	
Lectures	2 Hrs/Week	Test 1	15 Marks
Tutorial	1 Hrs/Week	Test 2	15 Marks
		Teacher Assessment	10 Marks
Total Credits	03	End-Semester Examination	60 Marks

Total Hours required for this course: 60 Hours.
Prerequisites: NIL

Course Description
This course is intended to introduce the students a coherent and balanced account of major discrete mathematical structures (Group, Rings, Integral Domain), Set theory(Binary relations, partial order relations ,Equivalence relations, equivalence classes, partitions), Discrete functions and recurrence relations(Z-transform, generating functions) ,concepts that form the basis of programming Languages and organization of data structure .

Course Objectives:

- To explain with examples the basic terminology of functions, relations, and sets.
- To perform the operations associated with sets, functions, and relations.
- To relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
- To demonstrate basic counting principles, including uses of diagonalization and the pigeonhole principle.

Course Outcomes:

After completing this course students will be able to:

CO1: Perform operations on discrete structures such as sets functions, relations construct proofs using mathematical induction and apply counting principal
CO2: Solve problems involving recurrence relations and generating functions and combinatorial problems
CO3: Demonstrate the knowledge of algebraic structures such as Groups, Subgroups, Generators, Co-sets
CO4: Demonstrate the knowledge of algebraic structures such as Rings, Fields, Integral Domain, Polynomial ring, cyclic codes.
CO5: Determine the Z-transform of elementary discrete functions
determine Inverse Z-transform of some mathematical functions
solve difference equations

Unit 1 Set, Relations and Functions

Combination of sets, finite and infinite sets, unaccountably infinite sets, mathematical induction, multisets, Properties of Binary Relations, Equivalence relation and partitions, Partial ordering Relations and Lattices. Chain and Antichains, A Job-Scheduling problem, Functions and Pigeonhole principles

Unit 2 Discrete Numerical Functions and Recurrence Relations

Manipulation and Numerical Functions, Asymptotic behavior, Generating functions and Combinatorial Problems, Recurrence relations, Linear

recurrence relations with constant coefficients, Homogeneous solutions, Particular Solutions, Total Solutions, Solutions by the method of generating functions.

Unit 3 **Groups,**
Introduction to Algebraic structures, Groups, Sub groups, Generators and Evaluation of powers, Cosets and Lagrange's Theorem, Permutation Group, Isomorphism and Automorphism, Homomorphism, Normal subgroup.

Unit 4 **Rings and Fields**
Rings, integral domains and fields. Ring Homomorphisms, polynomial rings and cyclic codes.

Unit 5 **Graphs,** graphs types, graphs Properties, Connectivity, Trees.

TEXT BOOKS:

1. C.L.Liu, "Elements of Discrete Mathematics", Tata McGraw-Hill Publication
2. B.K.Kolman,R.C.Busby and S.Ross, "Discrete Mathematical Structures", PHI
3. Trembley, Manohar, "Discrete mathematical Structures with Application to Computer Science", McGraw Hill Publication
4. B.S.Grewal, Higher Engineering Mathematics, KhannaPublication,New Delhi.

REFERENCE BOOKS:

1. Rm. Somasundaram, "Discrete Mathematical Structures", Prentice-Hall of India Pvt. Limited, 2004
2. Johnsonbaugh, "Discrete Mathematics", Pearson Education India, 2007.
3. K.D.Joshi, Foundations of Discrete Mathematics, Wiley eastern.

Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**H**	**M**	**L**									
CO2	**H**	**M**	**L**									
CO3	**H**	**M**	**L**									
CO4	**H**	**M**	**L**									
CO5	**H**	**M**	**L**									

H – High M – Medium L – Low

Teaching Strategies:

The teaching strategy is planed through the lectures, tutorials and team based home works. Exercises are assigned weekly to stimulate the students to actively use and revise the learned concepts which also help the students to express their way of solving the problems fluently in written form. Most critical concepts and mistakes are emphasized.

Teacher's Assessment: Teacher's Assessment of 20 marks is based on the following.

1) Home Assignments
2) Tutorials
3) Surprise written Test with multiple choice questions

Assessment Pattern

Assessment Pattern Level No.	Knowledge Level	Test	Teachers Assessment/ Assignment	End Semester Examination
K1	Remember	3 - 5	5	10 - 20
K2	Understand	3 – 5	5	10 - 20
K3	Apply	10 - 14	10	30 - 40
K4	Analyze	00	00	00
K5	Evaluate	00	00	00
K6	Create	00	00	00
Total		20	20	60

Assessment table

Course outcomes	CO1			CO2			CO3			CO4			CO5		
Assessment Tool	K1	K2	K3	K1	K2	K3	K1	K2	K3	K1	K2	K3	K1	K2	K3
Class Test 20 Marks	3	3	4							3	3	4			
Teachers Assessment 20 Marks	1	1	2	1	1	2	1	1	2	1	1	2	1	1	2
ESE Assessment 60 Marks	3	3	6	3	3	6	3	3	6	3	3	6	3	3	6

Special Instructions if any: Nil

Designed by

- Mathematics Department

CS2004: Lab Database Management System

Teaching Scheme

Practical	2 Hrs/Week
Credits	1

Evaluation Scheme

Team Work	25 Marks
Practical /Viva-voce	25 Marks

Total Hours required for this practical course: 30 Hours.
Prerequisites:
Laboratory Course Outcome:
After completion of this course student will be able to

CO1:Know the scope of SQL and use it to query,update and manage a database

CO2:Use PL/SQL

CO3:Identify functions of database administrator.

CO4:Demonstrate competence with advanced functions.

CO5:Design and build a simple database management system.

Suggestive list of experiments:-

1) To execute all the Basic DDL (Data Definition language) commands (i.e. Create, Alter, Drop, and Truncate) with example.
2) To execute all the Basic DML (Data Manipulation language) commands (i.e. Insert, Select, Update, and Delete) with example.
3) To Execute the Database Functions (i.e. Numeric, Date, Group, Character, and count function) with example.
4) To Execute the join Commands (i.e. Cartesian product, natural join, Inner join, left outer join, right outer join, equi join, non- equi join, and full join).
5) Implement the Program for Arithmetic operations (like addition, Subtraction, Multiplication and Division)' using PL/SQL (programming language in SQL).
6) Implement the concept for cursors in PL/SQL and demonstrate competence for loop constructs
7) To implement the program for updating the values using cursor.
8) To implement the Concept of Views and Sql Sub-Queries.
9) Mini-Project

Practical Examination will consist of Performance and Viva-voice Examination
The assessment will be based on the following –

1. Performance in the practical examination
2. Record of programs submitted by the candidate
3. Innovation & Creativity
4. Team building skills

5. Mini Project

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										H		
CO2										M		
CO3										M		
CO4									M			
CO5					L	H		M		M	H	

H – High M – Medium L - Low

Assessment Table

Assessment Tool	S1	S2	S3	S4	S5
	CO1,CO2,CO3	CO4	CO5		
Term Work (25 Marks)					
Practical Examination & Viva Voce (25 Marks)					

Assessment Pattern

Assessment Pattern Level No.	**Skill Level**	**Term Work**	**Practical Examination & viva voce**
S1	Imitation	10	10
S2	Manipulation	05	05
S3	Precision	10	10
S4	Articulation	00	00
S5	Naturalization	00	00
Total		25	25

Preparation (S1)	05	00
Conduct of Experiment (S2)	05	06
Observation and Analysis of Results (S3)	00	10
Record (S3)	05	09
Mini-Project / Presentation/ Viva-Voce (S3)	10	10
Total	**25**	**25**

CS 2005 Lab: Object Oriented Programming

Teaching Scheme		**Evaluation Scheme**	
Practical	2 Hrs/Week	Team Work	25 Marks
Credits	1	Practical /Viva-voce	25 Marks

Total Hours required for this practical course: 30 Hours.
Prerequisites:CS247: Lab Programming Language
Laboratory Course Outcome:
After completion of this course student will be able to

CO1: Execute JAVA programs based on simple constructs like arrays,loops , decision statements, functions etc
CO2: Incorporate object oriented concepts like classes , objects , inheritance , polymorphism resembling real time situation.
CO3: Demonstrate the use of packages and interfaces.
CO4: Develop OOP programs containing User created Exception handling & Threading.
CO5: Familiarize with Java development Environment such as Eclipse, NetBeans etc.

Suggestive list of programs.

1. Demonstrate the installation of JAVA with necessary path settings & Execute " Hello World " Program.
2. Execute simple program based on basic syntactical constructs of java like :
   a. Operators and Expression.
   b. Looping Statements.
   c. Decision making statements.
3. Construct & Execute a Java Program to define a class, describe its constructors, overload the constructors and instantiate its object.
4. Implement inheritance by applying various access controls to its data members and methods. Demonstrate use of method overriding.
5. Demonstrate use of implementing interfaces.
6. Implement Package and Sub-Packages.
7. Write a program to implement Wrapper classes and their methods.
8. Demonstrate use of I/O stream.
9. Implement the concept Exception Handling using predefined exception by creating user defined exception.
10. Implement the concept of multi threading.
11. Demonstrate database connectivity and add, delete, update and retrieve records from database using JDBC.
12. Design Applet to display a message in the Applet for configuring Applets by passing parameters.

Mapping of Course outcome with Program Outcomes

Course Outco	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO1 2

me												
CO1		H	H									
CO2		H	H									
CO3		H	H									
CO4		H	H									
CO5		H	H									

H – High M – Medium L - Low

Assessment Table

Assessment Tool	S1	S2	S3	S3	S2
	CO1	CO2	CO3	CO4	CO5
Term Work (25 Marks)	07	07	05	03	03
Practical Examination & Viva Voce (25 Marks)	05	05	05	05	05

Assessment Pattern

Assessment Pattern Level No.	**Skill Level**	**Term Work**	**Practical Examination & viva voce**
S1	Imitation	05	05
S2	Manipulation	08	10
S3	Precision	12	10
S4	Articulation	00	00
S5	Naturalization	00	00
Total		25	25

Preparation (S1)	04	05
Conduct of Experiment (S2)	04	07
Observation and Analysis of Results (S3)	08	05
Record (S2)	03	03
Mini-Project / Presentation/ Viva-Voce (S3)	06	05
Total	**25**	**25**

Special Instructions if any: Nil

Designed by

- Mrs. Pallavi V.Kulkarni
- Mrs. Meghana B. Nagori
- Mr. Nitin Dhutraj

CS 2006: LAB:Advanced c and c++			
Teaching Scheme		**Examination Scheme**	
Lectures:	**1 Hrs/Week**	**Term Work :**	**25 Marks**
Practical:	**2Hrs/Week**	**Practical /Viva :**	**25 Marks**
Credits:	**1**		

List of program for Advance C

1) C Program for implementing Pointer to structure.

2) C Program for implementing self referential structure.

3) C Program for implementing singly and doubly link list for

   1) Insertion of new node.

   2) Delete a node

   3) Lookup (Traversing a link list)

4) C++ program for constructor and destructor.

5) C++ Program for scope resolution operator.

6) C++ program for inheritance.

7) C++ Program for polymorphism.

8) C++ program for Inline function.

9) C++ program for Friend function.

10) C++ program for Virtual base class and virtual function .

11) C++ program for File handling.

CS 2007: LAB: Web Technology	
Teaching Scheme **Lectures: 1 Hrs/Week** **Practical: 2Hrs/Week**	**Examination Scheme** **Term Work : 25 Marks** **Practical /Viva : 25 Marks**

Prerequisites: -

Course description: This course aims at developing skill and awareness amongst students in area of Web Technology using HTML and CSS. After completion of this course student will be able to understand concepts of Web development, they will learn the new technologies associated with web

Course Objectives:

- To make students familiar with concepts of web designing
- To create awareness of latest web technologies amongst students
- To give students knowledge of advanced concepts of CSS helpful in creating professional Websites

Course Outcomes

After completing the course, students will able to:

CO1	Understand Presentational, and basic formatting tags of HTML
CO2	Implement CSS rules to give style to HTML Elements
CO3	Implement the Basic JavaScript functions and understand how to use them
CO4	Host website using Domain Nam e+ Hosting Services
CO5	Understand latest versions i.e. HTML 5, CSS 3

Detailed Syllabus:

Unit 1	Introduction to web, Introducing HTML Tags and Elements (Presentational, Basic Formatting, Lists, Links & Navigation, Images , Tables, Form Controls, Frame Element etc.), Properties of Tags & Events of the Elements.
Unit 2	Introduction to CSS – Adding CSS Rules, CSS Properties, CSS Selectors, Design Issues, Minimizing CSS, Inheritance in CSS, Reset in CSS, Browser Compatibility using CSS
Unit 3	Learning JavaScript – Adding Scripts to your pages, Document Object Model, Starting Program with JavaScript, Functions, Operators, Conditional Statements, and Looping.
Unit 4	Deployment – Introduction to domain and Hosting, Uploading website, Testing of website, Introduction to SEO, Using Analytics, AdWords and AdSense, Introduction to DHTML and XHTML.
Unit 5	Introduction to HTML 5, Introduction to CSS 3, Introduction to JQuery, Introduction to AJAX.

Text Books

1. Thomas Powell,"HTML & CSS: The Complete Reference", Fifth Edition by.
2. Jon Duckett ,"Beginning HTML, XHTML, CSS, and JavaScript". – Wrox Publication.
3. Head First HTML with CSS & XHTML – O'Reilly Publication.
4. HTML, CSS, JavaScript for Dummies.

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			M				M			M	M	
CO2			H				H			H	M	
CO3			H				H			H	M	
CO4			H				H			H	M	
CO5			H				H			H	M	

1 – High 2 – Medium 3 - Low

List of Experiments

Sr. No.	Details
1	Working with Basic Formatting & Presentational Tags.
2	Working with Form Elements like Button, Textbox etc.
3	Creating Tables, Frames and Layouts
4	Creating Inline, External style sheets.
5	Working with Advanced CSS.
6	Using JavaScript.
7	Writing Functions, Operators and Control Structures with JavaScript.
8	Using JQuery to add Animation Effects.
9	Using HTML 5 and CSS 3 Properties.
10	Mini Project

Assessment Table

Assessment Tool	S1	S2	S3	S3	S2
	CO1	CO2	CO3	CO4	CO5
Term Work (25 Marks)	07	07	05	03	03

Practical Examination & Viva Voce (25 Marks)	05	05	05	05	05

Assessment Pattern

Assessment Pattern Level No.	**Skill Level**	**Term Work**	**Practical Examination & viva voce**
S1	Imitation	05	05
S2	Manipulation	08	10
S3	Precision	12	10
S4	Articulation	00	00
55	Naturalization	00	00
Total		25	25

Preparation (S1)	08	10
Conduct of Experiment (S2)	08	14
Observation and Analysis of Results (S3)	16	10
Record (S2)	06	06
Mini-Project / Presentation/ Viva-Voce (S3)	12	10
Total	**50**	**50**

Semester II

CS2008: Data Structures

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs/Week	Test 1	15 Marks
		Test 2	15 Marks
Tutorials	1 Hrs/Week	Teacher Assessment	10 Marks
Total Credits	4	End-Semester Examination	60 Marks

Total Hours required for this course: 60 Hours.
Prerequisites: Programming Language

Course Description: This course presents a conceptual and practical introduction to organizing data in a computer so that it can be used efficiently. Practical introduction of data structure is cover using C language by implementation of various data structures. This course introduces concepts like ADT, stack, queue, linked lists, tree, graph, sorting technique and searching technique.

Course Educational Objectives:

- To discuss data structures like stack, queue, linked list, tree & graph.
- To implement all data structures in high level language & use them in various applications.
- To analyze & differentiate between different searching & sorting methods.

Course Outcomes Expected:

After Completing the course students will be able to :

CO1: Awareness of abstraction concepts.
CO2: Implement various data structures viz. stacks, queues, linked lists, trees and graphs.
CO3: Identify different applications of data structures.
CO4: Analyze &Compare various searching and sorting techniques.
CO5: Implement user defined data structures in a high level language.

UNIT 1	**Introduction to data structure & The Stack & Queues –** Data structure- linear and non linear, abstract data type Algorithm, performance analysis of algorithm, space and time complexity, Asymptotic Notation- Big O, Big omega, Big Theta The Arrays as an ADT: Using One-Dimensional Arrays, Using Two-Dimensional Arrays, Using Multidimensional Arrays, Definition and Examples, Primitive Operation, The stack as an ADT, stack applications - Basic Definition and examples: Infix, Postfix, and Prefix, Program to evaluate a Postfix expression, Limitations of the program ,The queue and its sequential representation, The queue as an ADT.	
Unit 2	**Linear Data Structure & their representation** Definition, concept, operation on linked lists, Circular linked lists, Doubly linked lists, Operations like insertion, deletion, insertion in order, searching, updating , Applications of linked lists such as polynomial manipulation, Comparison of singly linked, circularly linked & doubly linked list	
Unit 3	**Trees** Definition, Basic terminology, operation on binary trees, linked storage	

	representation for binary search trees, Basic operation on binary search tree such as creating a binary search tree, searching, modifying an element, inserting & deleting the element, destroy a binary search tree, tree traversals ,in-order, pre-order, post-order , tree application for expression evaluation & for solving sparse matrices,height balanced trees2-3 tree, B trees, B+ trees, Heap tree	
Unit 4	**Graphs** Definitions, basic terminology, matrix representation & implementation of graphs, graph travels, DFS, BFS, Shortest path, spanning tree	
Unit 5	**Sorting& searching and hashing techniques** Different sorting tech, classification on the basis of big-O notation, tech such as straight selection sort, bubble sort, merge sort, quick sort, heap sort, shell sort, radix sort, comparisons between different sorting techniques .Sequential searching, binary searching, Hashing Techniques.	

TEXT BOOKS:

1. YedidyahLangsam, Moshe J. Augenstein, Aaron M. Tenenbaum, "Data Structures using C and C++" ,Pearson Edition
2. G.S. Baluja," Principles of Data Structures using C and C++".

REFERENCE BOOKS:

1. Niklaus Wirth, "Algorithms + Data Structure = Programs" ,Amazon
2. Adam Drozdek,"Data Structures and Algorithms in C++",Amazon
3. Rajesh K. Shukla ,"Data Structures Using C & C++",Willy
4. Prof P.S.Deshpande& Prof O.G.Kakde, "C& Data Structures",dreamtech

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	M	M	M								M	
CO1	M		M									
CO2		M	M									
CO3		M	M									
CO4		M	M									
CO5											M	

H – High M – Medium L - Low

Teacher's Assessment: Teachers Assessment of 20 marks is based on one of the / or combination of few of following

1) Assignments
2) Tutorials
3) Power point presentation
4) Participation and enthusiasm towards problem solving
5) Creativity.

Assessment Pattern

Assessment Pattern Level No.	Knowledge Level	Test	Teachers Assessment/ Assignment	End Semester Examination
K1	Remember	10	05	18
K2	Understand	10	10	24
K3	Apply	00	05	18
K4	Analyze	00	00	00
K5	Evaluate	00	00	00
K6	Create	00	00	00
Total Marks 100		20	20	60

Assessment table

Assessment Tool	K1	K2	K3	K2	K3
	C01	C02	C03	CO4	CO5
Class Test (20 Marks)	10	10	00	00	00
Teachers Assessment (20 Marks)	05	05	05	05	00
ESE Assessment (60 Marks)	18	12	12	12	06

Special Instructions if any: Nil

Designed by

CS 2009: Computer Organization & Architecture

Teaching Scheme		Evaluation Scheme	
Lectures	4 Hrs/Week	Test 1	15 Marks
		Test 2	15 Marks
		Teacher Assessment	10 Marks
Total Credits	4	End-Semester Examination	60 Marks

Total Hours required for this course: 45 Hours.

Prerequisite: CS243: Microprocessor & Interfacing

Course Description: Course includes basic machine architecture and design, digital logic circuits, digital components, central processing unit, machine representation of instructions and data, addressing techniques, memory organization, and execution of instructions at machine level.

Course Educational Objectives:

- Illustrate the structure, function and characteristics of computer systems.
- Exhibit the design of the various functional units of digital computers
- Discuss different types of memories and their properties.
- Introduce basics of Parallel Computer Architecture.
-

Course Outcomes Expected:

After completion of this course students will be able to:

CO1: Discuss working of functional components of computer (K1)
CO2: Demonstrate instruction execution cycle (K1)
CO3: Categories various memory types according to their properties.(K2)
CO4: Describe the principles of memory management.(K2)
CO5: Explain how interrupts are used to implement I/O control and data transfers.(K3)

Detailed Syllabus:

UNIT-1 Computer Evolution

Organization and Architecture, Structure and function of computer , Functional Components of a computer, Basic operational concepts, Designing for performance,Perfomance assessment

UNIT-2 Computer Arithmetic

Scalar Data Types, Fixed and Floating point numbers, Signed numbers, Integer Arithmetic, 2's Complement method for multiplication, Booths Algorithm, Floating point representations, IEEE standards, Floating point arithmetic

UNIT-3 The Central Processing Unit

Functions of CPU, instruction sets and Examples of instruction set, addressing schemes, instruction formats, instruction cycle and instruction pipelining, Hardwired control unit, Micro programmed control unit

UNIT-4 Memory Organization

Basic Concepts, Semiconductor RAM Memories, Memory Hierarchy, Types of memories: ROM: PROM, EPROM, EEPROM, RAM: SRAM, DRAM, SDRAM, RDRAM, Direct Memory Access, Cache Memories, Virtual Memory, Memory Management Requirements, Secondary Storage, Organization and Mapping

Techniques, ,Error correction memories, Interleaved memories, RAID

UNIT-5 I/O Organization

Input /Output Organization

Accessing I/O Devices , Interrupts ,Bus Structure, Bus Operation, Arbitration, Interface Circuit, Interconnection Standards, , asynchronous data transfer, modes of data transfer

TEXT BOOKS

1. W. Stallings, "Computer Organization and Architecture: Designing for performance", 6th Edition, Prentice Hall of India, 2003, ISBN 81 – 203 – 2962 – 7
2. C. Hamacher, V. Zvonko, S. Zaky, "Computer Organization", McGraw Hill, 2002, 5th edition ISBN 007-120411-3

REFERENCE BOOKS

1. D. Paterson, J. Hennesy, "Computer Organization and Design: The Hardware Software Interface", 2nd Edition, Morgan Kauffman, 2000 ISBN
2. John P. Hayes, Computer Architecture and Organization, McGraw Hill

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				H					M			
CO2				H					M			
CO3				H					M			
CO4				H					M			
CO5				H					M			

H – High M – Medium L - Low

Teacher's Assessment: Teachers Assessment of 20 marks is based on one of the / or combination of few of following

1) Tutorials
2) Problem Solving
3) Power point presentation of case studies
4) Question & answer / Numerical solution

Assessment Pattern

Assessment Pattern Level No.	**Knowledge Level**	**Test**	**Teachers Assessment/ Assignment**	**End Semester Examination**
K1	Remember	20	05	25
K2	Understand	00	10	20
K3	Apply	00	05	15
K4	Analyze	00	00	00
K5	Evaluate	00	00	00
K6	Create	00	00	00
Total Marks 100		20	20	60

Assessment table

Assessment Tool	K1	K1	K2	K2	K3
	C01	C02	C03	CO4	CO5
Class Test (20 Marks)	10	10	00	00	00
Teachers Assessment (20 Marks)	05	00	00	10	05
ESE Assessment (60 Marks)	15	10	10	10	15

Special Instructions if any: Nil

Designed by

CS2010: Microprocessor Fundamentals and Interfacing

Teaching Scheme		**Evaluation Scheme**	
Lectures	3 Hrs/Week	Test 1	15 Marks
		Test 2	15 Marks
Tutorial	1 Hrs/Week	Teacher Assessment	10 Marks
Total Credits	4	End-Semester Examination	60 Marks

Total Hours required for this course: 60 Hours.

Prerequisites: NIL

Course Description: This course presents a conceptual and practical introduction to imperative and assembly level language programming, exemplified by Microcontroller. As well as providing grounding in the use of microcontroller, the course will cover general principles of programming in assembly level frameworks. This course introduces concepts like Digital electronics, memory & peripherals interfacing which provides real time programming approach in assembly level languages.

Course Educational Objectives:

- To familiarize with the Intel 8086 Microprocessor & instruction set.
- To develop & execute programs in assembly language.
- To demonstrate 8255 interfacing with 8086 microprocessor.

Course Outcomes:

After completion of this course students will be able to:

CO1: Solve K-MAPs and number system conversion, A.C, D.C. Loading Characteristics, Registers & Counters functioning while designing with digital gates. Design several multiplexer and De- multiplexer.

CO2: Describe 8086 internal hardware architecture and Implement assembly language Programs using 16 bit registers.

CO3: Describe 8086 CPU Design.

CO4: Explain microprocessor architecture of memory organization of 8086 microprocessor and memory interfacing.

CO5: Demonstrate interface and program using legacy peripherals.

UNIT 1 **Basics of Digital Electronics :** Binary ,Octal & Hexadecimal number System, Parity Code,7-bit hamming code, Logic gates ,K-Map, Multiplexers &De multiplexers , Flip-flops, Registers, Counters, Introduction to D/A,A/D convertor.

Unit 2 **8086 Microprocessor:**

8086 internal Architecture, memory Organization, Addressing modes , Accessing immediate & Register data ,memory accessing.

Instruction set of 8086, Programming with 8086:

8086 data transfer instruction, Arithmetic instruction, Bit manipulation instruction, String instruction, Conditional & unconditional branch instruction ,Process control instruction.

Use of Assembler Debug, Development cycle, debugging software

Modular Programming, Procedures

Develop programs in assembly language

Unit 3 **Designing 8086 CPU**

Basic 8086 CPU hardware design, Generating CPU clock and reset signals, Bus types and buffering techniques, 8086 minimum mode CPU module, 8086

maximum mode CPU module
Design minimum mode CPU module using appropriate tool such as ORCAD

Unit 4 Main memory design-SRAM,DRAM,ROM & interfacing
Basic input-output-Parallel, serial programmed and interrupt driven I/O,DMA

Unit 5 **Peripheral Controllers**
8255, 8259, 8251

TEXT BOOKS:

1. John P. Uffenbeck ,"8086 Family , Programming and interfacing", PHI 2001
2. Yu Chen Liu & Glenn A Gibson : "Microcomputer Systems; The 8086/8088 Family", PHI
3. R P Jain "Modern Digital Electronics" TATA MCGRAW HILL

REFERENCE BOOKS:

1. Walter A.Triebel, Avatar Singh ,"8088 & 8086 Microprocessors Programming Interfacing, software, Hardware & Applications"
2. Barry B. Brey,"The Intel Microprocessors", Hard cover 8th edition

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		M	M		H			H			H	
CO1		M	M									
CO2		M	M									
CO3		M	M									
CO4		M	M									
CO5					H			H			H	

H – High M – Medium L - Low

Teacher's Assessment: Teachers Assessment of 20 marks is based on one of the / or combination of few of following

1) Question answer based Theoretical Assignment
2) " Think More Write Less" Based (observation based) Assignment
3) Power point presentation of Topic which is related but out of syllabus
4) Class room Question & answer
5) Overall approach towards learning, creativity.

Assessment Pattern

Assessment Pattern Level No.	Knowledge Level	Test	Teachers Assessment/ Assignment	End Semester Examination
K1	Remember	10	05	15
K2	Understand	10	10	25
K3	Apply	00	05	20
K4	Analyze	00	00	00
K5	Evaluate	00	00	00
K6	Create	00	00	00

Total Marks 100	20	20	60

Assessment table

Assessment Tool	K1	K2	K3	K2	K3
	C01	C02	C03	CO4	CO5
Class Test (20 Marks)	10	10	00	00	00
Teachers Assessment (20 Marks)	05	00	00	10	05
ESE Assessment (60 Marks)	15	20	10	05	10

Special Instructions if any: Nil

Designed by

CS2011: (Engineering Science)Open Source Software Technology

Teaching Scheme		**Evaluation Scheme**	
Lecture	1 Hrs /Week		
Practical	2 Hrs/Week	Term Work	25 Marks
Total Credits	1	Practical/Viva-voce	25 Marks

Total Hours required for this practical course: 30 Hours.

Prerequisite: NIL

Course Educational Objectives:

- Demonstrate different open source technology like Linux, PHP & MySQL with different packages.
- Illustrate & implement Linux commands for programming.
- Create & execute programs of PHP with MySQL/ MariaDB connection
- Create & Implement programs of Python programming using MySQL / MariaDB connection

Course Outcomes Expected:

After completion of this course students will be able to:

CO1: Explore different open source technology like Linux, PHP & MySQL with different packages.
CO2: Implement Linux commands for programming.
CO3: Execute programs of PHP with MySQL/MariaDB server connection
CO4: Execute programs of Python with Mysql /Maria DB connection

The term work shall consist of following practical/assignments/mini-project/visit* based on following Theory

UNIT-1 Open Source and Linux

Open Source Definition, The distribution terms of open source software, open

source technology importance Free and open Source Software (FOSS), LAMP(Linux, Apache, MySQL, PHP, Python, and Perl) Benefits , Perspective of Open Source software Linux and Open Source, Linux Usage Basics: Logging into the system, changing users and editing text files.Running Commands and Getting Help.Browsing the File system, Users, Groups and Permissions.

UNIT-2 Apache and PHP

Introduction to Web server. Installing Apache on Linux: httpd service.
PHP : Testing Installation. Basics of PHP scripts, Variables, Datatypes,Operators and Expressions, Constants , Flow control functions, If statement, Loops, Arrays, Strings,Dates and Times, Forms

UNIT-3 MySQL/MariaDB Server and Application

MySQL Server: Configuring MySQL Server, working with MySQL Databases, MySQL Tables, SQL Standards-INSERT, SELECT, UPDATE, REPLACE, DELETE. Date and Time functions in MySQL.
PHP-MySQL Application Development: Connecting to MySQL with PHP, Inserting data with PHP, Retrieving data with PHP. Developing PHP scripts for dyanamic web page like Feedback form, online admission form online test.

UNIT-4 Python programming with MYSQL/MariaDB connection and pplication.

Understanding prerequisites for Python, Getting started with Hello /orld, Selecting code with conditionals loops, datatypes, variables, ithmetic expressions, string,arrays & functions, access MySQL atabases from Python, decimal datatypes, Creating retrieving updating id deleting records.

TEXT AND REFERENCE BOOKS

1. Red Hat Linux Bible by Christopher Negus. Wiley Publishing
ISBN: 0-7645-4333-4
2. PHP, MySQL and Apache by Julie C Meloni. Pearson Education
ISBN: 81-297-0443-9
3. The Complete Reference Linux by Peterson . Tata McGRAW HILL
ISBN:0-07-044489-7
4. Programming in Python 3, Second Edition, Mark Summerfield

5. Python Cookbook, Third Edition, David Beazley and Brian K. Jones, Shroff Publishers & Distributors Pvt. Ltd., ISBN : 978-93-5110-140-6

6. Learning Python FIFTH EDITION Mark Lutz

7. Programming Python (English) 4Th Edition Mark Lutz

8. Testing Python, David Sale, Wiley India (P) Ltd., ISBN : 978-81-265-5277-1

9.PHP Cookbook, 3rd Edition Solutions & Examples for PHP Programmers By David Sklar, Adam Trachtenberg Publisher: O'Reilly Media Final Release Date: June 2014 ISBN:978-1-4493-6375-8

| ISBN 10:1-4493-6375-X

Internet Resources:

1. http://opensource.org/
2. http://www-128ibm.com/developerworks/opensource/newto/
3. http://www.sun.com/software/opensource/
4. http://www.linux.org/lessons/beginner/
5. http://www.linux.org/lessons/interm/index.html
6. http://www.php.net/tut.php
7. http://www.howopensource.com/2011/07/foss-lab-manual
8. http://www.csetube.in7th-lab..html

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			H						H	H		
CO2			H						H	H		
CO3			H						H	H		
CO4			H						H	H		

H– High M – Medium L - Low

Assessment Table

Assessment Tool	S1	S2	S3
	CO1	CO2	CO3
Term Work (25 Marks)	5	10	10
Practical Examination & Viva Voce (25 Marks)	5	10	10

Assessment Pattern

Assessment Pattern Level No.	**Skill Level**	**Term Work**	**Practical Examination & viva voce**
S1	Imitation	05	05
S2	Manipulation	10	10
S3	Precision	10	10
S4	Articulation		
55	Naturalization		
Total		25	25

Preparation (S1)	05	05
Conduct of Experiment (S2)	05	05
Observation and Analysis of Results (S3)	05	05
Record (S2)	05	05
Mini-Project / Presentation/ Viva-Voce (S3)	05	05
Total	**25**	**25**

CS 2012: LAB: Adv Web Technology	
Teaching Scheme	**Examination Scheme**
Lectures: 1 Hrs/Week	**Term Work : 25 Marks**
Practical: 2Hrs/Week	**Practical /Viva : 25 Marks**

Prerequisites:-

Course description: This course aims at developing skill and awareness amongst students in area of Web Technology using HTML and CSS. After completion of this course student will be able to understand concepts of Web development, they will learn the new technologies associated with web

Course Objectives:

- To make students familiar with concepts of web designing
- To create awareness of latest web technologies amongst students
- To give students knowledge of advanced concepts of CSS helpful in creating professional Websites

Course Outcomes

After completing the course, students will able to:

CO1	Understand Presentational, and basic formatting tags of HTML 5
CO2	Implement CSS 3 rules to give style to HTML 5 Elements
CO3	Apply JQuery to build Modern User Interface
CO4	Build SEO Friendly Website and Marketing Strategy

Detailed Syllabus:

Unit 1	Introduction to HTML 5, HTML 5 Tags, Introduction to Bootstrap, Working with Bootstrap, Grid System and other important elements in Bootstrap
Unit 2	Introduction to CSS 3 – Introduction, Writing Media Queries, Creating Animations
Unit 3	JQuery: Introduction, Advantages, Events, Effects, Using JQuery to Create User Interface

Unit 4	**Online Marketing:** Tracking Website performance with Google Analytics, Using Google AdWords and AdSense, Social Media Marketing, Email Marketing **Search Engine Optimization:** Introduction, Building SEO Friendly website, SEO best practices, Online Reputation Management, Web Master Tools, Registering to Major Search EnginesDeployment – Introduction to domain and Hosting, Uploading website, Testing of website, Introduction to SEO, Using Analytics, AdWords and AdSense, Introduction to DHTML and XHTML.

Text Books

5. Thomas Powell,"HTML& CSS: The Complete Reference", Fifth Edition by.
6. Jon Duckett ,"Beginning HTML, XHTML, CSS, and JavaScript". – Wrox Publication.
7. Head First HTML with CSS & XHTML – O'Reilly Publication.
8. HTML, CSS, JavaScript for Dummies.

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			M				M			M	M	
CO2			H				H			H	M	
CO3			H				H			H	M	
CO4			H				H			H	M	
CO5			H				H			H	M	

1 – High2 – Medium3 - Low

List of Experiments

Sr. No.	Details
1	Working with Basic Formatting & Presentational Tags.
2	Working with Form Elements like Button, Textbox etc.
3	Creating Tables, Frames and Layouts
4	Creating Inline, External style sheets.
5	Working with Advanced CSS.
6	Using JavaScript.
7	Writing Functions, Operators and Control Structures with JavaScript.
8	Using JQuery to add Animation Effects.
9	Using HTML 5 and CSS 3 Properties.
10	Mini Project

Assessment Table

Assessment Tool	S1	S2	S3	S3	S2

	CO1	CO2	CO3	CO4	CO5
Term Work (25 Marks)	07	07	05	03	03
Practical Examination & Viva Voce (25 Marks)	05	05	05	05	05

Assessment Pattern

Assessment Pattern Level No.	**Skill Level**	**Term Work**	**Practical Examination & viva voce**
S1	Imitation	05	05
S2	Manipulation	08	10
S3	Precision	12	10
S4	Articulation	00	00
55	Naturalization	00	00
Total		25	25

Preparation (S1)	08	10
Conduct of Experiment (S2)	08	14
Observation and Analysis of Results (S3)	16	10
Record (S2)	06	06
Mini-Project / Presentation/ Viva-Voce (S3)	12	10
Total	**50**	**50**

CS2013: Lab Data Structures

Teaching Scheme		Evaluation Scheme	
Practical	2 Hrs/Week	Team Work	25 Marks
Credits	1	Practical/Viva-voce	25 Marks

Total Hours required for this practical course: 30 Hours.

Prerequisites: Lab Programming Language

Course Outcomes:

After Completing the course students will be able to:

CO1: Use basic data structures

CO2:Apply data structure for solving simple mathematical problems

CO3: Implement complex data structures like trees &graphs .

CO4: Implement basic searching & sorting methods.

CO5:Awareness to some real –world applications

Assignments should be completed which will be based on the subject and record for the same shall be submitted

1. Implement a C code for implementing Stack and to evaluate postfix expression.
2. Implement a program for Queue and Circular Queue.
3. Demonstrate with C code Singly Linked List and Doubly Linked List.
4. Illustrate a program for stack, queue and Circular Queue using Linked List.
5. Generate a C code for Creation of Binary Tree and operations on it.
6. Implement a C code for Creation of Binary Threaded Tree.
7. Demonstrate c code for Depth First search and Breadth First search.
8. Illustrate a C program for Bubble Sort and Bucket Sort.
9. Implement a C code for Merge Sort and Heap Sort.
10. Develop a C program for Insertion Sort and Quick sort.
11. Implement a program for sorting students roll nos(name etc)/searching for a roll no(name etc)
12. Develop a C program for Binary Search to search an element in the given sequence.

Khushbu Jain(mehta)

Mapping of Course outcome with Program Outcomes

H – High M – Medium L – Low

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO12
CO1	M											
CO2		M	M									
CO3		M	M									
CO4		M	M									
CO5				M				M				L

Assessment Table

Assessment Tool	S1	S2	S3	S3
	CO1	CO2	CO3	CO4
Term Work (25 Marks)	04	10	05	06
Practical Examination & Viva Voce (25 Marks)	03	08	07	07

Assessment Pattern

Assessment Pattern Level No.	**Skill Level**	**Term Work**	**Practical Examination & viva voce**
S1	Imitation	04	03
S2	Manipulation	10	08
S3	Precision	11	14
S4	Articulation	00	00
S5	Naturalization	00	00
Total		25	25

Preparation (S1)	04	03
Conduct of Experiment (S2)	06	06
Observation and Analysis of Results (S3)	06	06
Record (S2)	04	02
Viva-Voce (S3)	05	08
Total	**25**	**25**

CS 2014:LAB Microprocessor & Interfacing

Teaching Scheme		Evaluation Scheme	
Practical	2 Hrs/Week	Team Work	25 Marks
Credits	1	Practical /Viva-voce	25 Marks

Total Hours required for this practical course: 30 Hours.

Prerequisites:Theory- Microprocessor & Interfacing

Laboratory Course Outcome:

After completion of this course student will be able to

CO1: Describe the internal architecture of 8086

CO2: Execute ALP programs based on simple Addition, Subtraction etc.

CO3: Incorporate ALP concepts like 16-bit addition, subtraction, multiplication, division for resembling real time situation.

CO4: Demonstrate the use of memory designing & Interfacing.

CO5: Develop ALP programs for peripherals interfacing

Suggestive list of programs.

Practical Statements should be as or more hard than mentioned below

1. Introduction to 8086.
2.16-bit addition, subtraction, multiplication and division in Debug.
3. Assembly language program for 16-bit addition, subtraction, multiplication and division
4. Assembly language program for finding sum of series of 8-bit numbers in an array.
5. Assembly language program for finding largest and smallest number in an array.
6. Assembly language program for BCD multiplication.
7. Assembly language program for BCD division.
8. Assembly language program for BCD string addition.
9. Assembly language program for packed BCD to ASCII.
10.8255 interfacing with 8086.

Mapping of Course outcome with Program Outcomes

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		H	H									
CO2		H	H									
CO3		H	H									
CO4		H	H									
CO5		H	H									

H – High M – Medium L - Low

Assessment Table

Assessment Tool	S1	S2	S3	S3	S2
	CO1	CO2	CO3	CO4	CO5
Term Work (25 Marks)	07	07	05	03	03
Practical Examination & Viva Voce (25 Marks)	05	05	05	05	05

Assessment Pattern

Assessment Pattern Level No.	Skill Level	Term Work	Practical Examination & viva voce
S1	Imitation	05	05
S2	Manipulation	08	10
S3	Precision	12	10
S4	Articulation	00	00
S5	Naturalization	00	00
Total		25	25

Preparation (S1)	04	05
Conduct of Experiment (S2)	04	07
Observation and Analysis of Results (S3)	08	05
Record (S2)	03	03
Mini-Project / Presentation/ Viva-Voce (S3)	06	05
Total	**25**	**25**

Special Instructions if any: Nil

Designed by

- Mrs. Vijayshree A. Injamuri
- Mr. Sudhir G.Shikalpure
- Mrs. Madhuri A. Aher

CS 2015 : Lab-Programming in Java

Teaching Scheme		**Evaluation Scheme**	
Lectures	1 Hrs/Week	Term Work	50 Marks
Practical	4 Hrs/Week	Practical/Viva-voce	50 Marks
Total Credits	2		

Total Hours required for this practical course: 30 Hours.

Prerequisites:CS2014: Lab Programming Language
Course Outcome:
After completion of this course student will be able to
CO1: Write and resolve programming problems using Java Language
CO2: Build Java Application and Java Applet, Java Servlet
CO3: Identify Java standard libraries and classes
CO4: Understand and utilize Java Graphical User Interface in the program writing.
CO5: Develop and write Advanced Object Oriented Java Programs.

Suggestive list of programs.

1. To study Java EE 6 & Eclipse IDE Lab Exercises
2. To study and implement Multithreading.
3. To study and implement Applets with Swings.
4. To study and implement Socket Programming in java
5. To study and implement JDBC classes in java.
6. To study and implement RMI Programming
7. To study and develop servlets & AJAX.
8. To study and create Java Server Pages.
9. To study and implement MVC architecture and steps in creating it.
10. To study and implement struts application and steps in creating it.
11. To study and implement Hibernate and Spring Framework.
12. Mini-Project

Syllabus

UNIT-1 **The Collection Framework in Java**: Collection Class, Array List & linked list Classes, Inserting elements, HashSet and TreeSet Classes. Algorithm Support to Collection Classes.
J2EE: Introduction to Java Enterprise Edition 6, Need for JEE 6, Advantages of JEE 6, Types of Enterprise Architecture, JEE6 Best Practices, Introduction to Eclipse and its Integrated Development Environment

UNIT-2 **Networking in Java**: Java.Net Package, Socket Fundamentals and Sockets in Java,
Java Database Connectivity (JDBC): Understanding JDBC Classes, Performing CRUD (create, read, update and delete) Operations, Joining, Manipulating Databases with JDBC, Transaction Processing, Stored Procedures

Remote Method Invocation [RMI] :
Introduction To Distributed Computing, RPC, Client Side And Server Side Proxies, Introduction To RMI, Stubs And Skeletons, The Process Of Creating A Simple RMI Application, Callbacks, Bootstrap Server, RMI With JDBC, RMI Packages

UNIT-3 **Servlets**: Servlet Overview and Architecture, Introduction to Tomcat 7 Servlet container, Interface Servlet and the Servlet Life Cycle, Handling,HTTP get Requests, Handling HTTP post Requests, Redirecting Requests to Other Resources

Java Server Pages (JSP): Introduction, Java Server Pages Overview, A First Java Server Page Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries

AJAX: Introduction, Understanding Synchronous vs Asynchronous, Technologies, Examples, Operations, How AJAX works?

UNIT-4 **Introduction to MVC architecture and its significance.** Role of Servlets and JSP in MVC architecture.

Understanding Struts: What is Struts? Why Struts, MVC Framework, Building Model Components, Building View Components, Building Controller Components, Installing Struts, Developing Sample Application

UNIT 5 **Hibernate :**Introduction, difference between hibernate & JDBC,Architecture of hibernate & ORM understanding, Steps to configure hibernate & create sample program.

Spring : Spring Core Module,Spring J2EE module, Spring ORM, Spring JDBC, Spring AOP(Aspect Oriented Module),Spring Web MVC module

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		H			H				H			
CO2		H			M				H			
CO3		H			M				H			
CO4		H			H				H			
CO5		H			H				H			

H – High M – Medium L – Low

Assessment Table

Assessment Tool	**S2**	**S3**	**S3**	**S2,S4**
	CO1,CO4	CO2	CO3,CO5	CO5
Term Work (50 Marks)	20	10	10	10
Practical Examination & Viva Voce (50 Marks)	20	10	10	10

Assessment Pattern

Assessment Pattern Level No.	**Skill Level**	**Term Work**	**Practical Examination & viva voce**
S1	Imitation	06	00
S2	Manipulation	16	20
S3	Precision	20	20
S4	Articulation	08	10
S5	Naturalization	00	00
Total		50	50

Preparation (S1)	06	00
Conduct of Experiment (S2)	08	10
Observation and Analysis of Results (S3)	20	20
Record (S2)	08	10
Mini-Project / Presentation/ Viva-Voce (S4)	08	10
Total	**50**	**50**