


Government of Karnataka
Department of Technical Education
Bengaluru

	Course Title: Software Engineering		
	Scheme (L:T:P) : 4:0:0	Total Contact Hours: 52	Course Code: 15CS51T
	Type of Course: Lectures, Self Study & Student Activity.	Credit : 04	Core/ Elective: Core
CIE- 25 Marks		SEE- 100 Marks	
Prerequisites			

Basic knowledge about the development of programs.

Course Objectives

1. Discuss factors like cost, schedule, quality that drive a software project and to Learn the role of software process and a process model in a project.
2. Understand the role of SRS in a project and to know how requirements are validated.
3. Understand software architectural views and learn planning and estimation of a software project.
4. Describe the key design concepts of software engineering and articulate in Projects.
5. Illustrate principles of structured programming, testing modules using unit test frameworks and code inspection to improve quality of code.
6. Identify evolving trend in software Engineering with DevOps.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

Course outcome		CL	Linked PO	Teaching Hours
CO1	Identify the factors that drive software project and summarize the role of process model in a project	R,U	1,2,9,10	10
CO2	Appraise SRS and to develop use cases for a project	R,U,A	1,2,3,8,9,10	08
CO3	Evaluate system architecture and develop detailed task schedule from the overall estimates and planning	U,A	1,2,3,8,9,10	12
CO4	Summarize structured design Methodologies	U,A	1,2,3,4,8,9,10	08
CO5	Illustrate different coding principles with unit test process	R,U,A	1,2,3,7,8,9,10	10
CO6	Identify the need for DevOps.	R,U	1,2,4,9,10	04
Total				52

Legends: R = Remember U= Understand; A= Apply and above levels (Bloom's revised taxonomy)

Course-PO Attainment Matrix

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
Software Engineering	3	3	3	2	-	-	1	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

Course Content and Blue Print of Marks for SEE

Unit No	Unit Name	Hour	Questions to be set for SEE			Marks Weightage	Marks Weightage (%)
			R	U	A	A	
I	The software problem & Software process	10	05	15	05	25	17
II	Software requirements analysis and specifications.	08	05	10	10	25	17
III	Software architecture & planning a software project	12	--	20	15	35	25
IV	Design	08	05	10	10	25	17
V	Coding and Testing	10	--	15	10	25	17
VI	Devops	04	--	05	05	10	7
Total		52	15	75	55	145	100

UNIT I : The software problem & Software process

10 Hrs

Software Problem - Cost, Schedule and quality, Scale and Change.

Software Process - Process and Project, Component Software Processes, Software development Process Models, Waterfall, Prototyping, Iterative development, Rational Unified Process, Time boxing Model, Extreme programming and Agile processes, Using process model in a project, Project Management Process.

UNIT II: Software requirements analysis and specifications

08 Hrs

Value of good SRS, Requirement process, Requirement Specification, Desirable Characteristics of an SRS, Components of an SRS, Structure of a Requirements Documents, Functional Specification with use cases, Basics, Examples, Extensions, Developing use cases, Other Approaches for Analysis, Data Flow Diagram, Validation.

UNIT III: Software architecture & Planning a software project

12 Hrs

Software Architecture - Role of Software Architecture, Architecture Views, Component and Connector view, Components, Connectors, Example, Architecture styles for C&C View, Pipe and Filter, Shared data Style, Client Server style, Some other styles, Documenting Architecture Design, Evaluating Architectures.

Planning a software project - Effort Estimation, Top-Down Estimation Approach, Bottom-Up Estimation Approach, Project Schedule and Staffing, Quality Planning, Risk Management Planning, Risk Management Concepts, Risk Assessment, Risk Control, A Practical Risk Management Approach, Project Monitoring Plan, Measurements, Project Monitoring and tracking, Detailed Scheduling.

UNIT IV: Design

08 Hrs

Design Concepts, Coupling, Cohesion, the Open-Closed Principle, Function Oriented Design, Structure Charts, Structured Design Methodology, Example, Object Oriented Design, OO Concepts Unified Modelling Language (UML), A Design Methodology, Examples, Detailed Design, Logic/Algorithm Design, State Modelling of Classes, Verification.

UNIT V: Coding & Testing

10 Hrs

Coding - Programming Principles and Guidelines, Structured Programming, Information Hiding, Some Programming Practices, Coding Standards, Incrementally Developing Code, An incremental coding process, Test Driven development, Pair Programming, Managing Evolving Code, Source Code Control and Build, Refactoring, Unit Testing, Testing procedural units, Unit testing of Classes, Code Inspection, Planning, Self review, Group review meeting.

Testing - Testing Concept, Error, Fault and Failure, Test Case, Test Suite and Test Harness, Psychology of Testing, Levels of Testing, Testing Process, Test Plan, Test Case Design, Test Case Execution.

UNIT VI: Devops

04Hrs

Devops, Introduction-Definition, Devops Tool chain, Why Devops?, Goals, Benefits, Relationship to Agile and Devops (continuous delivery), Devop Tools.

Text books

1. Software Engineering –A Precise Approach, Pankaj Jalote, edition 2010, Wiley India, ISBN: 9788126523115.
2. <https://en.wikipedia.org/wiki/DevOps>
3. <http://www.informationweek.com/devops/agile-vs-devops-10-ways-theyre-different/d/d-id/1326121>

References

1. Software Engineering A Practitioners Approach, Roger S Pressman, 2010, Tata McGraw Hill Publishing Co Ltd, ISBN 9780070701137
2. Software Engineering, Sajan Mathew, 2009 Reprint, S Chand publications.
3. Software Engineering Principles and Practices, Rajesh Narang. Mc Graw Hill Education.
4. Software Engineering, Subramanian Dutt, 2015 Pearson Publications

Suggested list of student activities

Note: the following activities or similar activities for assessing CIE (IA) for 5 marks (Any one)

Student activity like mini-project, surveys, quizzes, etc. should be done in group of 3-5 students.

1. Each student should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course coordinator and programme coordinator.
2. Each student should conduct different activity and no repeating should occur
 1. A survey on Software Development Life Cycle(SDLC).
 2. Presentation on Software Architecture.
 3. A report on testing the software products.
 4. Quiz.

Course Delivery

The course will be delivered through lectures and Power point presentations/ Video

Course Assessment and Evaluation Scheme

Method	What		To who m	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE	IA	Students	Three IA tests (Average of three tests will be computed)	20	Blue books	1,2,3,4
				Student activities	05	Report	1,2,3,4
				Total	25		
	SE E	End Exam		End of the course	100	Answer scripts at BTE	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1 & 2 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1,2,3,4,5,6 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation

*SEE – Semester End Examination

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

1. Blue books (20 marks)
2. Student suggested activities report for 5 marks evaluated through appropriate rubrics.
3. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

Questions for CIE and SEE will be designed to evaluate the various educational components (Bloom's taxonomy) such as:

Sl. No	Bloom's Category	%
1	Remembrance	10

2	Understanding	50
3	Application	40

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

4. Blue books (20 marks)
5. Student suggested activities report for 5 marks
6. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

FORMAT OF I A TEST QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks			
Ex: I test/6 th week of sem 10-11 AM	V SEM		20			
	Year:					
Name of Course coordinator : Units: __ CO's: ____						
Question no	Question		MARKS	CL	CO	PO
1						
2						
3						
4						

Note: Internal choice may be given in each CO at the same cognitive level (CL).

MODEL QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks	
Ex: I test/6 th week of sem 10-11 AM	V SEM	Software Engineering	20	
	Year: 2017-18	Course code: 15CS51T		
Name of Course coordinator : Units:1,2 Co: 1,2				
Note: Answer all questions				
Question no	Question	CL	CO	PO
1	Explain components of software processes.(5) OR Discuss the desirable characteristics of an SRS.(5)	U	1,2	1,2
2	Discuss the various notations used in ER-diagram.(5) OR Compare scale and change in a software problem.(5)	U	1,2	1,2
3	Explain Waterfall model with a neat diagram. (10) OR Explain Prototyping model.(10)	U	1	1,2

Format for Student Activity Assessment

DIMENSION	Unsatisfactory 1	Developing 2	Satisfactory 3	Good 4	Exemplary 5	Score
-----------	---------------------	-----------------	-------------------	-----------	----------------	-------

Collection of data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collects some basic information; refer to the topic	Collects relevant information; concerned to the topic	Collects a great deal of information; all refer to the topic	3
Fulfill team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs all duties	Performs all duties of assigned team roles with presentation	4
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Does the assigned job without having to be reminded.	Always does the assigned work without having to be reminded and on given time frame	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Listens, but sometimes talk too much	Listens and contributes to the relevant topic	Listens and contributes precisely to the relevant topic and exhibit leadership qualities	3
TOTAL						13/4=3.25=4

Note: This is only an example. Appropriate rubrics/criteria may be devised by the concerned course co-ordinator for assessing the given activity.

MODEL QUESTION PAPER

Code: 15CS51T

Diploma in Computer Science & Engineering

V- Semester

Course Title: Software Engineering

Time: 3 Hours

Max Marks: 100

PART-A

Answer any **SIX** questions. Each carries 5 marks.

5X6=30 Marks

1. Explain cost, schedule and quality.
2. Explain components of software processes.
3. Explain desirable characteristics of an SRS.
4. Explain Data Flow Diagram.
5. Discuss the role software architecture.
6. Explain Bottom-Up estimation approach.
7. Explain Structure charts.
8. Discuss the various OO concepts.
9. Define use case. List out the terms used in use cases.
10. Explain different attributes of software quality.
11. Define the term Error, Fault, Failure, Test Case and Test Suite.
12. Define Devops. Discuss the goals and benefits of Devops.
13. Explain the life cycle of defect.

PART-B

Answer any **SEVEN** full questions each carries 10 marks.

10X7=70 Marks

1. Explain the Waterfall model with a neat diagram.
2. Explain Time boxing model with a neat diagram.
3. Explain components and connectors with an example.
4. Explain different architectural styles.
5. Explain the effort estimation of a software project.
6. Explain the Risk management concepts.
7. Explain various design concepts.
8. Explain structured design methodology.
9. Explain Test Driven development.
10. Compare Agile and Devops.



MODEL QUESTION BANK

Diploma in Computer Science & Engineering

V Semester

Course Title: Software Engineering

CO	Question	CL	Marks
----	----------	----	-------


I	Define software Engineering. Differentiate between process and project	R	05
	Discuss the main differences between student software and industrial software.	U	
	Explain cost, schedule and quality.	U	
	Define scale and change in a software problem.	U	
	Define different attributes of software quality.	U	
	Explain software process and software project.	A	
	Classify the software process components.	U	
	Explain software development process model. List the various software development process models.	A	
	Explain project management process.	A	
	Explain Extreme programming.	U	
	Explain Agile processes.	U	
	Explain the temporal relationship between development and management process.	A	
	Discuss the software process and software project.	A	10
	Explain components of software processes.	A	
	Explain Waterfall model with a neat diagram.	A	
	Explain Time boxing model with a neat diagram.	U	
	Explain Prototyping model.	U	
	Explain iterative development model.	U	
	Explain Rational Unified Process(RUP) model.	A	
	Explain Extreme programming and Agile processes.	A	
	Explain the phases of project management process.	U	
II	Mention the values of good SRS.	R	05
	Explain requirement process.	A	
	Discuss the desirable characteristics of an SRS.	U	
	Explain the general structure of SRS.	A	
	Define use case. List out the terms used in use cases.	R	
	Explain the various abstractions in each level while developing use cases.	A	
	Write the steps for analysis when employing use cases.	A	
	Explain the concept of state and projection .List the different approaches for problem analysis.	U	
	Discuss the various notations used in ER-diagram.	U	
	Explain the validation of SRS.	A	
	Explain the components of SRS.	U	10
	Explain the Data Flow Diagram with a neat diagram.	A	
	Discuss use case scenario with an example.	A	
III	Define software architecture. Explain the important uses of software architecture.	R	05
	Explain the role of software architecture.	A	
	Explain Components view.	U	
	Explain Connectors view.	U	
	Define architectural styles. List the architecture styles.	U	

IV	Explain Peer-to-Peer & Publish-Subscribe styles.	U	
	Discuss how to evaluate a proposed architecture.	A	
	Describe the role of effort estimation in a project.	A	
	Explain Top-Down estimation approach.	U	
	Explain Bottom-Up estimation approach.	U	
	Explain project scheduling and staffing with an example.	A	
	Define quality plan. Explain quality control activities.	R	
	Explain Risk Control.	U	
	Explain practical approach for Risk management planning.	A	
	Explain measurements in project monitoring plan.	U	
	Explain project monitoring and tracking plan.	U	
	Explain detailed scheduling.	A	
	Explain the architectural view.	U	10
	Explain architectural view with an example.	U	
	Explain components and connectors with a neat diagram.	U	
	Explain different architectural styles.	U	
	Explain Pipe and Filter Style.	U	
	Explain Shared-Data Style.	U	
	Explain Client-Server Style.	U	
	What should an architecture document for a system contain?	A	
	Explain COCOMO Model.	A	
	Explain Bottom-Up approach.	U	
	Explain Quality Planning.	U	
	Explain Risk management concepts.(any one)	U	
	Explain the goal of Risk Assessment to prioritize the risk.	A	
IV	Identify the goal of Design and mention the main criteria for evaluating the design.	U,A	05
	Define coupling. List the different types of it.	R	
	Define cohesion. List the different levels of cohesion.	R	
	Describe the cohesion in OO system.	U,A	
	Explain open closed principle.	U	
	Explain Structure Charts for creating function oriented design.	U	
	Explain OO design methodology.	U	
	Define UML. List the different types of UML modelling.	R	
	With an example explain word counting problem for OO design.	U,A	
	Write a note on Logic/Algorithm Design.	A	
	Write a note on State Modelling of Classes.	A	
	Explain the approaches for design verification.	A	
	Explain the various Design concepts.	U	10
	Explain the different types of coupling between the modules.	U	
	Explain the different levels of cohesion.	A	
	Explain Structure Design Methodology for function oriented design.	U	
	Explain the word counting problem through DFD and factoring.	A	
	Explain main Object Oriented Concepts.	U	

	Explain Class diagram with an example.	U	
	Explain Sequence diagram with an example.	U	
	Explain Collaboration diagram with an example.	U	
	Explain state diagram and activity diagram.	U	
	Explain the OO Design methodology.	U	
V	Define coding. Explain the basic goal of coding.	R,U	05
	Predict the necessity of coding standards explain any one	U,A	
	Write a note on Source code control.	U	
	Write a note on Bad smells of refactoring.	A	
	Define Unit Testing. Write a note on Testing Procedural Units.	R,U	
	Define Code inspection and summarize the report of an inspection.	R,A	
	Define testing. Discuss the goal of testing.	U	
	Define error, fault, failure, Test case, Test suite and test harness.	R	
	Write a note on Test plan.	U	
	Explain the test case specification in the test case design.	A	
	Explain the life cycle of defect.	U,A	10
	Explain the necessary Programming Practices for coding	U,A	
	Explain Coding standards.	U	
	Explain Incremental Coding process with a neat flow chart.	U	
	Explain Test Driven Development (TDD) with a neat flow chart.	U	
	Explain Structured Programming.	A	
	Explain Information Hiding.	U	
	Explain Pair Programming.	U	
	Explain Refactoring.	A	
	Explain Unit testing of Classes with example.	U,A	
	Explain Code Inspection.	U	
	Explain different levels of testing and the goals of each level.	U,A	
	Explain the Testing process.	U,A	
VI	Define DevOps. Discuss the goal of DevOps	R,U	5
	Explain the benefits of DevOps.	U	
	Explain DevOps tool chain.	U	
	Explain the DevOps Tools.	U	10
	Explain the necessity of DevOps in detail	U,A	
	Compare Agile and DevOps.	A	



Government of Karnataka
Department of Technical Education
Bengaluru

	Course Title: Web Programming		
	Scheme (L:T:P) : 4:0:0	Total Contact Hours: 52	Course Code: 15CS52T
	Type of Course: Lectures, Self Study & Student Activity.	Credit : 04	Core/ Elective: Core
CIE- 25 Marks		SEE- 100 Marks	

Prerequisites:

Knowledge of HTML and CSS.

Course Objectives

To study the concepts of web application development such as XHTML, XML, PHP, Java web software, and Database access through JDBC and PHP.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

Course outcome		CL	Linked PO	Teaching Hours
CO1	Discuss the fundamentals of web and concept of XHTML.	R,U,A	1,2,3,6,7,8,9,10	06
CO2	Describe different concepts of JavaScript and XHTML documents and Construct dynamic documents with JavaScript.	U,A	1,2,3,6,7,8,9,10	12
CO3	Describe XML using the user defined tags, DTD, Namespaces and Schemas with simple programs.	R,U,A	1,2,3,6,7,8,9,10	08
CO4	Discuss the concepts of PHP with associated programs	R,U,A	1,2,3,6,7,8,9,10	10
CO5	Discuss different ways to access the database through the web using examples.	U,A	1,2,3,6,7,8,9,10	06
CO6	Discuss various server based software using different technologies.	U,A	1,2,3,6,7,8,9,10	10
Total				52

Legends: R = Remember U= Understand; A= Apply and above levels (Bloom's revised taxonomy)

Course-PO Attainment Matrix

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
Web Programming	3	3	3	-	-	3	3	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

Course Content and Blue Print of Marks for SEE

Unit No	Unit Name	Hour	Questions to be set for SEE			Marks Weightage	Marks Weightage (%)
			R	U	A	A	
I	Fundamentals and Introduction to XHTML	06	05	05	05	15	10.35
II	Java Script and XHTML Documents and Dynamic documents with JavaScript	12	-	20	15	35	24.13
III	Introduction to XML	08	05	10	05	20	13.79
IV	Introduction to PHP	10	05	15	10	30	20.69
V	Database Access through Web	06	-	05	10	15	10.35
VI	Java Web Software	10	-	15	15	30	20.69
Total		52	15	70	60	145	100

UNIT I : Fundamentals and Introduction to XHTML**06 Hrs**

Fundamentals – A brief introduction to Internet, Origins, What the Internet Is, Internet Protocol Addresses, Domain Names, The World Wide Web, Origins, Web or Internet, Web browsers, Web servers, Web Server Operations, General Server Characteristics, Apache, IIS, Uniform Resource Locators, URL Formats, URL Paths, Multipurpose Internet Mail Extensions, Type Specification, Experimental Documental Types, Hypertext Transfer Protocol, The Request Phase, The Response Phase, Security, The web Programmers Toolbox

Introduction to XHTML: Syntactic differences between HTML and XHTML

UNIT II: JavaScript and XHTML documents and Dynamic documents with JavaScript**12 Hrs**

JavaScript and XHTML documents – The JavaScript Execution Environment, The Document Object Model, Element Access in JavaScript, Events & Event Handling, Basic Concepts of Event handling, Events, Attributes & Tags, Handling Events from Body Elements, Handling Events from Button Elements, Handling Events from Textbox & password Elements, The Focus Event, Validating from Input, The DOM2 Event Model, Event Propagation, Event handler registration, An Example of the DOM2 Event Model, The Navigator Object, DOM Tree Traversal and Modification, DOM Tree Traversal, DOM Tree Modification.

Dynamic documents with JavaScript: Introduction, Positioning Elements, Absolute Positioning, Relative Positioning, Static Positioning, Moving Elements, Element Visibility, Changing Colors & Fonts, Changing Colors, Changing Fonts, Dynamic Contents, Stacking Elements, Locating the Mouse Cursor, Reacting to the Mouse Click, Slow Movement of Elements, Dragging & Dropping Elements.

UNIT III: Introduction to XML

08 Hrs

Introduction, The Syntax of XML, XML Document Structure, Document Type Definitions, Declaring Elements, Declaring Attributes, Declaring Entities, A Sample DTD, Internal & External DTDs, Namespaces, XML Schema, Schemas Fundamentals, Defining the Schema, Defining the Schema Instances, An Overview of Data types, Simple Types, Complex Types, Displaying Raw XML Documents, Displaying XML Documents with CSS.

UNIT IV: Introduction to PHP

10 Hrs

Introduction to PHP: Origins and Uses of PHP, Overview of PHP, General Syntactic Characteristics, Primitives, Operations and Expressions, Variables, Integer Type, Double Type, String Type, Boolean Type, Arithmetic Operations & Expressions, String Operations, Scalar Type conversions, Output, Control statements, Relational Operators, Boolean Operators, Selection Statements, Loop statements, An Example, Arrays, Array Creation, Accessing array Elements, Functions for Dealing with Arrays, Sequential Access to Array Elements, Sorting Arrays, Functions, General Characteristics of Functions, Parameters, The scope of Variables, The Lifetime of Variables, Pattern Matching, Form Handling, Files, Opening and Closing Files, Reading from a File, Writing to a File, Locking Files, Cookies, Introduction to Cookies, PHP Support for Cookies, Session Tracking.

UNIT V: Database access through the Web

06 Hrs

Database Access with PHP & MySQL, Potential Problems with Special Characters, Connecting to MySQL & Selecting the Database, Requesting MySQL Operations, A PHP/MySQL Examples, Database Access with JDBC & MySQL, JDBC & MySQL, Metadata, Examples.

UNIT V: Java Web Software

10 Hrs

Introduction to Servlets, Overview, Details, Servlet Containers, The NetBeans IDE, Storing information on Clients, Cookies, Servlet support for Cookies, Examples, JavaServer Pages(JSP), Motivation for JSP, JSP Documents, The Expression Language, The JSTL control action elements, JavaBeans, Model-View-Controller Application Architecture, JavaServer Faces, The tag libraries, JSF event handling, An example application.

Text books

1. Programming the World Wide Web, 7th edition, Robert W. Sebesta, Pearson Education, ISBN- 9789332518827

References

1. <http://www.tutorialspoint.com/>
2. <http://www.w3schools.com/>
3. Web Programming – Building Internet Applications, 3rd edition, Chris Bates, Wiley publisher

4. Web Technologies— HTML,JavaScript,PHP,java,JSP,ASP.Net,XML & Ajax – Black Book, Wiley, ISBN : 978-81-7722-997-4
5. PHP A Begineer's Guide --- Vikram Vaswami , TMH publishers. ISBN: 13:978-0-07-014069-1

Suggested list of student activities

Note: the following activities or similar activities for assessing CIE (IA) for 5 marks (Any one)

Student activity like mini-project, surveys, quizzes, etc. should be done in group of 3-5 students.

1. Each student should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course coordinator and programme coordinator.
2. Each student should conduct different activity and no repeating should occur

1	Prepare a simple website using NetBeans IDE.
2	Demonstration of PHP program which includes database access.
3	Create a simple webpage using JSON.
4	Quiz

Course Delivery

The course will be delivered through lectures and Power point presentations/ Video

Course Assessment and Evaluation Scheme

Method	What		To who m	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE	IA	Students	Three IA tests (Average of three tests will be computed)	20	Blue books	1 to 6
				Student activities	05	Report	1 to 6
				Total	25		
	SEE	End Exam		End of the course	100	Answer scripts at BTE	1 to 6
Indirect Assessment	Course Survey		Students	Middle of the course		Feedback forms	1, 2, 3 Delivery of course
				End of the course		Questionnaires	1 to 6 Effectiveness of Delivery of instructions & Assessment Methods

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Questions for CIE and SEE will be designed to evaluate the various educational components (Bloom's taxonomy) such as:

Sl. No	Bloom's Category	%
1	Remembrance	10
2	Understanding	50
3	Application	40

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

1. Blue books (20 marks)
2. Student suggested activities report for 5 marks
3. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

FORMAT OF IA TEST QUESTION PAPER (CIE)

FORMAT OF PA TEST QUESTION PAPER (CIE)						
Test/Date and Time		Semester/year	Course/Course Code		Max Marks	
Ex: I test/6 th week of sem 10-11 AM		V SEM			20	
		Year:				
Name of Course coordinator : CO's: _____						Units: __
Question no	Question		MARKS	CL	CO	PO
1						
2						
3						
4						

Note: Internal choice may be given in each CO at the same cognitive level (CL).

MODEL QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks	
Ex: I test/6 th week of sem 10-11 AM	V SEM	Web Programming	20	
	Year: 2017-18	Course code: 15CS52T		
Name of Course coordinator : Units:1,2 COs: 1,2				
Note: Answer all questions				
Question no	Question	CL	CO	PO
1	Explain the operation of web server. (5) OR Explain MIME with its type specification. (5)	U	1	1,2,3,6,7,8,9,10
2	Explain how to handle the focus event with an example (5) OR Illustrate Moving elements with simple example. (5)	A	2	1,2,3,6,7,8,9,10
3	Illustrate the HTTP protocol's request and response phases with an example for each. (10)	A	1	1,2,3,6,7,8,9,10

Format for Student Activity Assessment

DIMENSION	Unsatisfactory 1	Developing 2	Satisfactory 3	Good 4	Exemplary 5	Score
Collection of data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collects some basic information; refer to the topic	Collects relevant information; concerned to the topic	Collects a great deal of information; all refer to the topic	3
Fulfill team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs all duties	Performs all duties of assigned team roles with presentation	4
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Does the assigned job without having to be reminded.	Always does the assigned work without having to be reminded and on given time frame	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Listens, but sometimes talk too much	Listens and contributes to the relevant topic	Listens and contributes precisely to the relevant topic and exhibit leadership qualities	3
TOTAL						13/4=3.25=4

Note: This is only an example. Appropriate rubrics/criteria may be devised by the concerned course co-ordinator for assessing the given activity.

Diploma in Computer Science & Engineering**V- Semester****Course Title: Web Programming****Time: 3 Hours****Max Marks: 100****PART-A****Answer any SIX questions. Each carries 5 marks.****5X6=30 Marks**

1. Define Web Browser, Web Server, Event, Event Handling and Internet.
2. Describe the parameters and actions of the setTimeout and setInterval functions.
3. Define DTD. Mention four possible keywords in DTD declaration.
4. Explain four scalar types of PHP.
5. Explain built-in string manipulation functions.
6. Explain potential problems associated with special characters.
7. Construct a PHP script to insert records through form into a database.
8. Write a note on JavaBeans.
9. Explain JSF event handling.

PART-B**Answer any SEVEN full questions each carries 10 marks.****10X7=70 Marks**

1. Illustrate the HTTP protocol's request and response phases with an example for each.
2. Illustrate with an example for dynamic stacking of images
3. Explain declaring of elements, attributes and entities in DTD with an example.
4. Explain different XSD indicators.
5. Explain how to create indexed and associated array with an example.
6. Write a PHP script to illustrate sort, assort and ksort functions.
7. Write a PHP script to insert record into the table and retrieve records from the table.
Assume a table "my_detail" is already created with fields name, city, phone_no and mail_id.
8. Explain the steps involved in accessing MySQL database through JDBC.
9. Explain life cycle of a Servlet.
10. Explain steps in JDBC.



MODEL QUESTION BANK**Diploma in Computer Science & Engineering****V Semester****Course Title: Web Programming**


CO	Question	CL	Marks
I	Define Web Browser, Web Server, Event, Event Handling and Internet	R	05
	Explain domain names with an example.	U	
	Explain the operation of web server.	U	
	Illustrate the general server characteristics.	U	
	Explain the file structure of web server.	U	
	Define MIME, Web security, URL	R	
	Discuss URL format with its different paths.	U	
	Explain MIME with its type specification	U	
	Illustrate the HTTP protocol's request and response phases	U	
	Discuss web security issues.	U	
	Mention the differences between html and xhtml.	U	
	Explain the HTTP protocol's request and response phases with an example for each.	A	10
	Explain the operation of Web Server with its file structure.	U	
II	Explain the structure of DOM.	U	05
	List DOM node properties	U	
	Describe the parameters and actions of the setTimeout and setInterval functions.	U	
	Illustrate Moving elements with simple example.	A	
	Explain Element visibility with simple example	A	
	Explain how to locate the mouse cursor.	U	
	Explain different types of positioning with an example	U	10
	Illustrate with an example for dynamic stacking of images	A	
	Explain with an example how to change dynamically background and foreground Colors of the document.	A	
	Illustrate moving elements and element visibility with an example.	A	
	Discuss the two ways to register an event handler in DOM-0 event model.	A	
	Explain the 3 phases of event processing in the DOM-2 event model	A	
	Illustrate how to handle blur event and change event with an example	A	
	Explain how to handle the focus event with an example	A	
	Write a note on XML.	U	05
	List the features of XML	U	
	Write a note on XML document structure.	U	
	Define DTD. Mention four possible keywords in DTD declaration.	R	
	Define XML schema. List the advantage of XML schema over DTD.	R	
	Differentiate between simple type and complex type XML elements.	U	
	Explain Internal and External DTD's with an example.	U	

III	Illustrate declaring of elements, attributes and entities in DTD with an example.	A	10
	Explain different XSD indicators.	A	
	Explain how to declare namespace with example.	A	
	Explain schema and schema instance with an example.	A	
	Explain how to create simple type and complex type element with an example.	A	
IV	Write a note on PHP.	U	5
	Explain four scalar types of PHP.	U	
	Explain built-in string manipulation functions.	U	
	Explain Implicit and Explicit type conversions.	U	
	Write PHP script to compute the sum of positive integers upto 30 using do-while statement.	A	
	Write PHP script to compute factorial of 'n' using while or for loop construct.	U	
	Explain the syntax of for-each statement with an example.	A	
	Write a PHP script to sort an array of elements.	A	
	Explain how cookies are extracted using PHP.	U	
	Write a note on session tracking.	U	
	Explain preg_match() and preg_split() functions with example.	U	
	Construct a PHP script to compute the squareRoot, Square, Cube and Quad of 10 numbers.	A	10
	Explain how to create indexed and associated array with an example.	U	
	Write a PHP script to illustrate sort, assort and ksort functions.	A	
	Write a note on PHP and its scalar types.	U	
	Explain types of arrays with an example in PHP.	A	
V	Explain potential problems associated with special characters.	U	05
	Write PHP functions used to connect to MYSQL database and selecting a database	U	
	Construct a PHP script to insert records through form into a database.	A	
	Construct a PHP script to retrieve records from the database table.	A	
	Discuss how the collection of metadata extracted from a database.	U	
	Explain the use of mysql_query() method used to execute SQL queries with its syntax.	U	
	Write a PHP script to create a table, insert records into the table, retrieve records from the table. Assume database "Student" and table "cs_student" with fields name, sem, regno, address	A	10
	Write a PHP script to insert record into the table and retrieve records from the table. Assume a table "my_detail" is already created with fields name, city, phone_no and mail_id	A	
	Construct a PHP script to insert and retrieve records from the database table.	A	
	Illustrate the use of: Mysql_query(), mysql_connect(), mysql_select_db(), mysql_num_rows() and mysql_num_fields()	U	
	Explain the steps involved in accessing mySQL database through JDBC.	U	
	Write a note on Servlet Containers.	U	

VI	Explain doGet and doPost methods of the HttpServlet class.	U	05
	Write a note on Cookies.	U	
	List the five parts of JSTL.	U	
	Explain three elements associated with JSP.	U	
	Write a note on MVC application Architecture.	U	
	Explain the two standard tag libraries of JSF.	U	10
	Explain the different methods of Cookies with an example.	A	
	Explain the processing flow of JSP documents with a neat diagram.	U	
	Illustrate JSTL control action elements with an example for each.	A	



Government of Karnataka
Department of Technical Education
Bengaluru

	Course Title: Design and Analysis of Algorithms		
	Scheme (L:T:P) : 4:0:0	Total Contact Hours: 52	Course Code: 15CS53T
	Type of Course: Lectures, Self Study & Student Activity.	Credit : 04	Core/ Elective: Core
CIE- 25 Marks		SEE- 100 Marks	

Prerequisites:

Knowledge of Data Structures.

Course Objectives

Study the concepts of fundamentals of algorithm, Analysis of algorithm efficiency, Brute force techniques, Divide-and-Conquer, Decrease-and-Conquer, Greedy techniques.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

Course outcome		CL	Linked PO	Teaching Hours
CO1	Discuss the fundamentals of algorithm.	<i>R,U</i>	1,2,3,7,8,9,10	10
CO2	Describe the analysis of algorithm efficiency using different notations.	<i>R,U,A,AL</i>	1,2,3,7,8,9,10	10
CO3	Discuss various problems using Brute force technique.	<i>U,A,AL</i>	1,2,3,7,8,9,10	12
CO4	Describe various problems using Divide-and-Conquer Technique.	<i>U,A,AL</i>	1,2,3,7,8,9,10	08
CO5	Describe various problems using Decrease-and-Conquer	<i>U,A,AL</i>	1,2,3,7,8,9,10	06
CO6	Discuss Greedy Techniques	<i>U,A</i>	1,2,3,7,8,9,10	06
Total				52

Legends: R = Remember U= Understand; A= Apply AL=Analyze E=Evaluate C= Create and above levels (Bloom's revised taxonomy)

Course-PO Attainment Matrix

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
Design and Analysis of Algorithms	3	3	3	-	-	-	3	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

Course Content and Blue Print of Marks for SEE

Unit No	Unit Name	Hour	Questions to be set for SEE				Marks Weightage	Marks Weightage (%)
			R	U	A	AL	A	
I	Introduction	10	10	15	05	-	30	20.68
II	Fundamentals of the Analysis of Algorithm Efficiency	10	05	05	10	10	30	20.68
III	Brute Force	12		10	10	15	35	24.14
IV	Divide-and-Conquer	08	-	05	05	10	20	13.79
V	Decrease-and-Conquer	06	-	05	05	05	15	10.35
VI	Greedy Technique	06	-	05	05	05	15	10.35
	Total	52	15	45	40	45	145	100

UNIT I : Introduction

10 Hrs

What is an Algorithm? Fundamentals of Algorithmic problem solving, Important problem types. Fundamental data structures

UNIT II: Fundamentals of the Analysis of Algorithm Efficiency

10 Hrs

Analysis Framework, Measuring the input size, Units for measuring Running time, Orders of Growth, Worst-case, Best-case and Average-case efficiencies, Asymptotic Notations and Basic Efficiency classes, Informal Introduction, O-notation, Ω -notation, θ -notation, mathematical analysis of non-recursive algorithms, mathematical analysis of recursive algorithms.

UNIT III: Brute Force & Exhaustive Search

12 Hrs

Introduction to Brute Force approach, Selection Sort and Bubble Sort, Sequential search, Exhaustive Search- Travelling salesman Problem and Knapsack Problem, Depth First Search, Breadth First Search

UNIT IV: Divide-and-Conquer

08 Hrs

Introduction, Merge Sort, Quick Sort, Binary Search, Binary Tree traversals and related properties.

UNIT V: Decrease-and-Conquer

06 Hrs

Decrease-and-Conquer: Introduction, Insertion Sort, Topological Sorting.

UNIT VI: Greedy Technique

06 Hrs

Greedy Technique: Introduction, Prim's Algorithm, Kruskal's Algorithm, Dijkstra's Algorithm

Text books

1. **Introduction to the Design and Analysis of Algorithms**, 3rd edition, Anany Levitin, Pearson Publication, ISBN: 9789332583771

References

1. <http://nptel.ac.in/courses/106101060/>
2. http://www.tutorialspoint.com/data_structures_algorithms/
3. Design & Analysis of Algorithms, S. Nandagopalan, Sapna Book House.

Suggested list of student activities

Note: the following activities or similar activities for assessing CIE (IA) for 5 marks (Any one)

Student activity like mini-project, surveys, quizzes, etc.

1. Each individual student should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course coordinator and programme coordinator.
2. Each student should conduct different activity and no repeating should occur

1	Build and execute programs from the unsolved exercises given from the course textbook at the end of each chapters.
2	Quiz

Course Delivery

The course will be delivered through lectures and Power point presentations/ Video

Course Assessment and Evaluation Scheme

Method	What		To to who m	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE	IA	Students	Three IA tests (Average of three tests will be computed)	20	Blue books	1 to 6
				Student activities	05	Report	1 to 6
				Total	25		
	SEE	End Exam		End of the course	100	Answer scripts at BTE	1 to 6
Indirect Assessment			Students	Middle of the course		Feedback forms	1, 2, 3 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1 to 6 Effectiveness of Delivery of instructions & Assessment Methods

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Questions for CIE and SEE will be designed to evaluate the various educational components (Bloom's taxonomy) such as:

Sl. No	Bloom's Category	%
1	Remembrance	10
2	Understanding	30
3	Application	30
4	Analysis	30

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

1. Blue books (20 marks)
2. Student suggested activities report for 5 marks
3. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

FORMAT OF I A TEST QUESTION PAPER (CIE)

FORMAT OF PA TEST QUESTION PAPER (CIE)						
Test/Date and Time	Semester/year	Course/Course Code	Max Marks			
Ex: I test/6 th week of sem 10-11 Am	V SEM		20			
	Year:					
Name of Course coordinator : Units: __ CO's: __						
Question no	Question		MARKS	CL	CO	PO
1						
2						
3						
4						

Note: Internal choice may be given in each CO at the same cognitive level (CL).

MODEL QUESTION PAPER (CIE)

Test/Date and Time	Semester/year	Course/Course Code	Max Marks		
Ex: I test/6 th week of sem 10-11 AM	V SEM	Design and Analysis of Algorithms	20		
	Year: 2017-18	Course code: 15CS53T			
Name of Course coordinator : Units:1,2 Co: 1,2					
Note: Answer all questions					
Question no	Question		CL	CO	PO
1	Explain Euclid’s algorithm for computing GCD of two numbers.(5) OR Explain Linear data structures with example. (5)		U, A	1,2	1,2,3,7,8, 9,10
2	Write an algorithm for sequential search and analyse its worst-case, best-case and average-case efficiencies. (5) OR Write a recursive algorithm for computing the factorial		U, A	1,2	1,2,3,7,8, 9,10

	function for an arbitrary non-negative integer.(5)			
3	Apply selection sort to the following array 45,23,89,10,11,27,38 (5)	A, AL	2	1,2,3,7,8, 9,10
4	Differentiate undirected and directed graphs with examples. (5)	U	1	1,2,3,7,8, 9,10

Format for Student Activity Assessment

DIMENSION	Unsatisfactory 1	Developing 2	Satisfactory 3	Good 4	Exemplary 5	Score
Collection of data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collects some basic information; refer to the topic	Collects relevant information; concerned to the topic	Collects a great deal of information; all refer to the topic	3
Fulfill team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs all duties	Performs all duties of assigned team roles with presentation	4
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Does the assigned job without having to be reminded.	Always does the assigned work without having to be reminded and on given time frame	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Listens, but sometimes talk too much	Listens and contributes to the relevant topic	Listens and contributes precisely to the relevant topic and exhibit leadership qualities	3
TOTAL						13/4=3.25=4

Note: This is only an example. Appropriate rubrics/criteria may be devised by the concerned course co-ordinator for assessing the given activity.

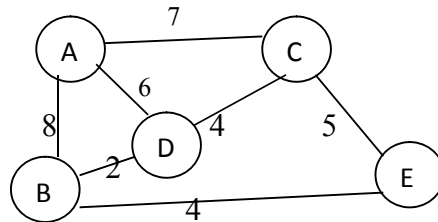
MODEL QUESTION PAPER

Code: 15CS53T

Diploma in Computer Science & Engineering
V Semester
Course Title: Design and Analysis of Algorithms

PART-A**Answer any SIX questions. Each carries 5 marks.****5X6=30 Marks**

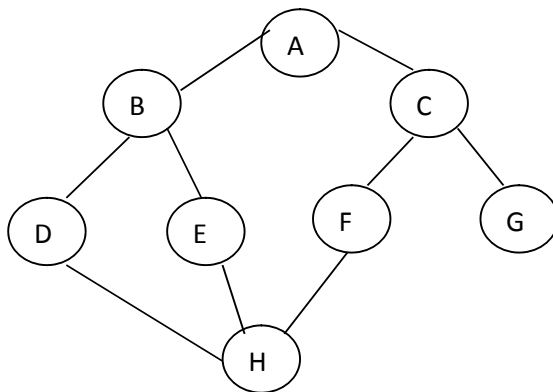
1. Explain Euclid's algorithm for computing GCD of two numbers.
2. Differentiate undirected and directed graphs with examples.
3. Write a pseudo code for finding the value of the largest element in a list of n numbers.
4. Write a recursive algorithm for computing the factorial function for an arbitrary non-negative integer.
5. Define Brute force and explain it with example.
6. Define binary tree. Explain its traversals.
7. Derive an expression for worst case analysis of binary search algorithm
8. Apply Prim's algorithm for the graph shown below



9. Write Greedy algorithm and explain

PART-B**Answer any SEVEN questions. Each carries 10 marks.****7X10=70 Marks**

1. Explain the steps involved in designing and analysing an algorithm.
2. Write a note on Sorting and Searching problem types.
3. Write an algorithm for sequential search and analyse its worst-case, best-case and average-case efficiencies.
4. Apply selection sort to the following array : 45,23,89,10,11,27,38
5. Explain bubble sort method with an example. Use Brute Force approach.
6. Solve using DFS algorithm



8. Write an algorithm of Quick Sort and trace it for an example data set.
9. Compute time complexity of insertion sort in the best, worst and average cases.
10. Write the Kruskal's algorithm to find the minimum cost spanning tree.


**MODEL QUESTION BANK****Diploma in Computer Science & Engineering****V Semester****Course Title: Design and Analysis of Algorithms**

CO	Question	CL	Marks
I	Define Algorithm. Give an example illustrating the notion of an algorithm.	R	05
	Explain Euclid's algorithm for computing GCD of two numbers.	U,A	
	Explain Linear data structures with example.	U	
	Define Graph, Vertex, Edge, Path and Length of a path with example for each.	R	
	Write a note on Weighted graph with an example.	U	
	Give the differences between sets and dictionaries.	R	
	Explain the steps involved in designing and analysing of an algorithm.	U	10
	Write a note on Sorting and Searching problem types.	U	
	Explain Rooted Trees and Ordered Trees with example for each.	U	
II	Write an algorithm for sequential search.	U,A	05
	Write a pseudo code for finding the value of the largest element in a list of n numbers.	U,A	
	Write a recursive algorithm for computing the factorial function for an arbitrary non-negative integer.	U,A	
	Illustrate an algorithm for sequential search and Analyse its worst-case, best-case and average-case efficiencies.	AL	10
	Explain Big-oh notation, Big-omega notation and Big-theta notation along with its graph.	AL	
	Explain basic Asymptotic efficiency classes.	U	
	Illustrate the recursive solution to the Tower of Hanoi Puzzle.	A,AL	
III	Define Brute force and explain it with example.	R,U	5
	Write an algorithm for closest pair problem using brute force.	U,A	
	Illustrate an algorithm for Selection sort with example.	A,AL	10
	Illustrate an algorithm for Bubble sort with example.	A,AL	
	Illustrate Travelling salesman problem with example.	A,AL	
	Explain Breadth First Search algorithm	A,AL	
	Consider knapsack for the instance given below N=3 [w1,w2,w3]=[100,10,10] [p1,p2,p3]=[20,15,15] M=105 Find all feasible and infeasible solutions	A,AL	
	Explain Depth First Search algorithm	A,AL	
IV	Write an algorithm for binary search.	U,A	5
	Define binary tree. Explain its traversals.	R,U	
	Explain Divide-and-Conquer technique with neat diagram.	U	
	Explain Merge sort algorithm with example.	A,AL	10
	Write Quick Sort algorithm and trace it with an example.	A,AL	
	Analyze the binary search algorithm for best case, worst case and average cases.	AL	
V	Explain Decrease-and-Conquer technique with neat diagram.	U	05
	Explain topological sorting with example.	A	
	Write an algorithm for Insertion sort with example.	A,AL	10
	Compute time complexity of insertion sort in the best, worst and average cases.	AL	
	Explain greedy method with appropriate example	U,A	5

VI	Can the Prim's algorithm be applied for directed graphs? justify	U,A	10
	Write the algorithm to find the minimum cost spanning tree based on Prim's logic	A, AL	
	Explain Kruskal's algorithm for constructing a minimum spanning tree.	AL	
	Write Prim's algorithm for constructing a minimum spanning tree	AL	
	Explain Dijkstra algorithm with an example.	AL	



Government of Karnataka
Department of Technical Education
Bengaluru

	Course Title: Green Computing		
	Scheme (L:T:P) : 4:0:0	Total Contact Hours: 52	Course Code: 15CS54T
	Type of Course: Lectures, Self Study & Student Activity.	Credit : 04	Core/ Elective: Core
CIE- 25 Marks		SEE- 100 Marks	

Prerequisites:

Knowledge of basic IT trends and technologies.

Course Objectives

Study the concepts related to Green IT, Green devices and hardware along with software methods, green enterprise activities, managing the green IT and various laws, standards, protocols along with outlook of green IT.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

Course outcome		CL	Linked PO	Teaching Hours
CO1	Discuss Green IT with its different dimensions and Strategies.	R,U	1,2,3,7,8,9,10	08
CO2	Describe Green devices and hardware along with its green software methodologies.	R,U	1,2,3,7,8,9,10	12
CO3	Discuss the various green enterprise activities, functions and their role with IT.	R,U	1,2,3,7,8,9,10	08
CO4	Describe the concepts of how to manage the green IT with necessary components.	R,U	1,2,3,7,8,9,10	08
CO5	Discuss the various laws, standards and protocols for regulating green IT.	R,U	1,2,3,7,8,9,10	08
CO6	Identify the various key sustainability and green IT trends.	R,U	1,2,3,7,8,9,10	08
Total				52

Legends: R = Remember U= Understand; A= Apply and above levels (Bloom's revised taxonomy)

Course-PO Attainment Matrix

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
Green Computing	3	3	3	-	-	-	3	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

Course Content and Blue Print of Marks for SEE

Unit No	Unit Name	Hour	Questions to be set for SEE			Marks Weightage	Marks Weightage (%)
			R	U	A	A	
I	Green IT: An Overview	08	05	10	-	15	10.34
II	Green Devices and Hardware with Green Software	12	10	20	-	30	20.68
III	Green Enterprises and the Role of IT	08	05	20	-	25	17.24
IV	Managing Green IT	08	05	20	-	25	17.24
V	Regulating the Green IT: Laws, Standards and Protocols	08	05	20	-	25	17.24
VI	Green IT: An Outlook	08	05	20	-	25	17.24
Total		52	35	110	-	145	100

UNIT I : Green IT: An Overview

08 Hrs

Introduction, Environmental Concerns and Sustainable Development, Environmental Impacts of IT, Green IT, Holistic Approach to Greening IT, Greening IT, Applying IT for enhancing Environmental sustainability, Green IT Standards and Eco-Labeling of IT, Enterprise Green IT strategy, Green IT: Burden or Opportunity?

UNIT II: Green Devices and Hardware with Green Software

12 Hrs

Green Devices and Hardware: Introduction, Life Cycle of a device or hardware, Reuse, Recycle and Dispose.

Green Software: Introduction, Energy-saving software techniques, Evaluating and Measuring software Impact to platform power.

UNIT III: Green Enterprises and the Role of IT

08 Hrs

Introduction, Organization and Enterprise Greening, Information systems in Greening Enterprises, Greening Enterprise: IT Usage and Hardware, Inter-Organizational Enterprise activities and Green Issues, Enablers and making the case for IT and Green Enterprise.

UNIT IV: Managing Green IT

08 Hrs

Introduction, Strategizing Green Initiatives, Implementation of Green IT, Information Assurance, Communication and Social media.

UNIT V: Regulating the Green IT: Laws, Standards and Protocols

08 Hrs

Introduction, The regulatory environment and IT manufacturers, Non regulatory government initiatives, Industry associations and standards bodies, Green building standards, Green data centers, Social movements and Greenpeace.

UNIT VI: Green IT: An Outlook

08 Hrs

Introduction, Awareness to implementations, Greening by IT, Green IT: A megatrend?, A seven-step approach to creating green IT strategy, Research and Development directions.

Text books

1. **Harnessing Green IT Principles and Practices** , San Murugesan, G.R. Gangadharan
Wiley Publication, ISBN:9788126539680

Suggested list of student activities

Note: the following activities or similar activities for assessing CIE (IA) for 5 marks (Any one)

Student activity like mini-project, surveys, quizzes, etc.

1. Each individual student should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course coordinator and programme coordinator.
2. Each group should conduct different activity and no repeating should occur

1	Any two discussion question to be solved given at the end of each chapter of the text book.
2	Quiz

Course Delivery

The course will be delivered through lectures and Power point presentations/ Video

Course Assessment and Evaluation Scheme

Method	What		To who m	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE	IA	Students	Three IA tests (Average of three tests will be computed)	20	Blue books	1 to 6
				Student activities	05	Report	1 to 6
				Total	25		
	SEE	End Exam		End of the course	100	Answer scripts at BTE	1 to 6
Indirect Assessment			Students	Middle of the course		Feedback forms	1, 2, 3 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1 to 6 Effectiveness of Delivery of instructions & Assessment Methods

Note: I.A. test shall be conducted for 20 marks. Average marks of three tests shall be rounded off to the next higher digit.

Questions for CIE and SEE will be designed to evaluate the various educational components (Bloom's taxonomy) such as:

Sl. No	Bloom's Category	%
1	Remembrance	24
2	Understanding	76

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

1. Blue books (20 marks)
2. Student suggested activities report for 5 marks
3. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

FORMAT OF I A TEST QUESTION PAPER (CIE)

FORMAT OF A TEST QUESTION PAPER (CIE)						
Test/Date and Time	Semester/year	Course/Course Code	Max Marks			
Ex: I test/6 th week of sem 10-11 AM	V SEM		20			
	Year:					
Name of Course coordinator :		Units: CO's:				
Question no	Question	MARKS	CL	CO	PO	
1						
2						
3						
4						

Note: Internal choice may be given in each CO at the same cognitive level (CL).

MODEL QUESTION PAPER (CIE)

Test/Date and	Semester/year	Course/Course Code	Max Marks
---------------	---------------	--------------------	-----------

Time					
Ex: I test/6 th week of sem 10-11 AM	V SEM	Green Computing	20		
	Year: 2017-18	Course code: 15CS54T			
Name of Course coordinator : Units:1,2 Co: 1,2					
Note: Answer all questions					
Question no	Question		CL	CO	PO
1	Define Green IT and list the benefits of Green IT.(5) OR Explain the 3Rs of Green IT. (5)		R,U	1	1,2
2	Explain different types of processor power states. (5) OR Discuss the impacts of various chemicals used in manufacturing process of electronic devices. (5)		U	2	1,2
3	Explain the life cycle of a device or hardware with diagram.(10)		U	2	1,2

Format for Student Activity Assessment

DIMENSION	Unsatisfactory 1	Developing 2	Satisfactory 3	Good 4	Exemplary 5	Score
Collection of data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collects some basic information; refer to the topic	Collects relevant information; concerned to the topic	Collects a great deal of information; all refer to the topic	3
Fulfill team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs all duties	Performs all duties of assigned team roles with presentation	4
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Does the assigned job without having to be reminded.	Always does the assigned work without having to be reminded and on given time frame	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Listens, but sometimes talk too much	Listens and contributes to the relevant topic	Listens and contributes precisely to the relevant topic and exhibit leadership qualities	3
TOTAL						13/4=3.25=4

Note: This is only an example. Appropriate rubrics/criteria may be devised by the concerned faculty (Course Coordinator) for assessing the given activity

MODEL QUESTION PAPER

Code: 15CS54T

Diploma in Computer Science & Engineering

V- Semester

Course Title: Green Computing

PART-A**Answer any SIX questions. Each carries 5 marks.****5X6=30 Marks**

1. Define Green IT and list the benefits of Green IT.
2. Explain the 3Rs of Green IT.
3. Explain different types of processor power states.
4. Discuss the impacts of various chemicals used in manufacturing process of electronic devices.
5. Explain the four major categories of enablers for Green IT.
6. List the different issues in integrating ERP with EMIS system.
7. Give the differences between strategic thinking and strategic planning.
8. List the steps of Risk Assessment.
9. Discuss the various functions of Green-IT based applications.
10. List any five principles of Green Engineering.

PART-B**Answer any SEVEN full questions each carries 10 marks.****10X7=70 Marks**

1. Explain the life cycle of a device or hardware with diagram.
2. Discuss the different methods of data efficiency.
3. Explain with diagram ERP system with modules and relationships.
4. Explain different software and database aspects of an EMIS.
5. Explain Enterprise Architecture Planning with different layers.
6. Explain the continuous Risk Management with a neat diagram.
7. Give the differences between RoHS, REACH and WEEE.
9. Explain with diagram for the global regulatory environment for the electrical, electronic and IT sectors.
10. Explain seven-step approach to create Green IT strategy.

**MODEL QUESTION BANK****Diploma in Computer Science & Engineering****V Semester****Course Title: Green Computing**


CO	Question	CL	Marks
----	----------	----	-------

I	Define Green IT and list the benefits of Green IT.	R	05
	Define climate change, global warming, greenhouse gases and greenhouse effect.	R	
	Explain how the software impact the environment and the energy consumption of computing systems.	U	
	Describe different dimensions or directions of Green IT.	U	
	Mention six holistic approaches that addresses Green IT.	R	
	Discuss whether Green IT is burden or Opportunity?	U	
	Explain the 3Rs of Green IT.	U	
II	Discuss the impacts of various chemicals used in manufacturing process of electronic devices.	U	05
	Explain the various e-waste disposal techniques and which is the most effective among them and why?	U	
	Explain different types of processor power states.	U	
	Write a note on context awareness in computers.	U	
	Explain how data buffering can save energy.	U	
	Explain the life cycle of a device or hardware with diagram.	U	10
	Describe Reuse, Recycle and Disposal methods of an electronic device.	U	
	Explain the different programming methods used to achieve computational efficiency.	U	
	Discuss the different methods of data efficiency.	U	
III	List the different issues in integrating ERP with EMIS system.	R	05
	Explain the four major categories of enablers for Green IT.	U	
	Write a note on Greening the Enterprise: IT Usage and Hardware.	U	
	Describe the major categories of information systems within an organization? Provide examples of greening enterprise activities at each level.	U	10
	Explain different software and database aspects of an EMIS.	U	
	Explain with diagram ERP system with modules and relationships.	U	
	Explain with diagram the flows and operations of a de-manufacturing facility.	U	
IV	Give the differences between strategic thinking and strategic planning.	R	5
	Explain the different enterprise architecture planning levels.	U	
	List the four key components of Green IT management.	R	
	List the steps of Risk Assessment.	R	
	Explain the three steps GQM paradigm.	U	
	Write a note on communication and social media.	U	10
	Explain Enterprise Architecture Planning with different layers.	U	
	Explain the continuous Risk Management with a neat diagram.	U	
V	Discuss the various functions of Green-IT based applications.	U	05
	Mention the several key standards for process and product of Green IT.	R	
	Mention the four criteria to evaluate electronics manufacturers employed by Greenpeace.	U	
	Write a note on Industry associations and Standard bodies.	U	
	Write a note on RoHS.	U	
	Write a note on REACH.	U	
	Write a note on WEEE.	U	10
	Give the differences between RoHS, REACH and WEEE.	U	
	Explain with diagram for the global regulatory environment for the electrical, electronic and IT sectors.	U	
	Write a note on Green Engineering.	U	

VI	List any five principles of Green Engineering.	R	05
	Mention the various features for a modern smart Grid.	R	
	Explain the key benefits of smart Grid.	U	
	Discuss the general guidelines for making an enterprise's functional units green.	U	
	Mention the various measures adopted by an organization to green their supply chain.		
	Explain the various key sustainability and Green IT trends.	U	10
	Explain seven-step approach to create Green IT strategy.	U	



Government of Karnataka
Department of Technical Education
Bengaluru

	Course Title: Web Programming Lab		
	Scheme (L:T:P) : 0:2:4	Total Contact Hours: 78	Course Code: 15CS55P
	Type of Course: Tutorial and Practical's	Credit :03	Core/ Elective: Core
CIE- 25 Marks			SEE- 50 Marks

Prerequisites

Knowledge of HTML, CSS.

Course Objectives

To study the concepts of web applications which includes XHTML, XML, PHP, Java, Ruby with data base access.

Course Outcome

On successful completion of the course, the students will be able to attain CO:

Course Outcome		Experiment linked	CL	Linked PO	Teaching Hrs
CO1	Create dynamic documents using XHTML and java script.	1 and 2	U,A,AL	1 to 10	18
CO2	Develop programs by XML which includes user defined tags.	3 and 4	U,A,AL	1 to 10	18
CO3	Construct PHP documents by using string, arrays, methods and also database access through PHP.	5 to 8	U,A,AL	1 to 10	24
CO4	Create applications using Java Servlets and JSP.	9 to 12	U,A,AL	1 to 10	18
			Total sessions		78

Legends: R = Remember U= Understand; A= Apply AL= Analyze E= Evaluate C= Create and above levels (Bloom's revised taxonomy)

Course-PO Attainment Matrix

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
Web Programming Lab	3	3	3	3	3	3	3	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

List of Graded Practical Exercises

Sl.No	Practical/Exercise
Dynamic Documents with Java Script	
1	The document must have a paragraph of text that describes your home. Choose atleast three different phrases (3 to 6 words) of this paragraph and make them change font, font style, color and font size when the mouse cursor is placed over them. Each of the different phrases must change to different fonts, font styles, colors and font sizes.
2	The document must contain four short paragraphs of text stacked on top of each other with only enough of each showing so that the mouse cursor can also be placed over some part of them. When the cursor is placed over the exposed part of any paragraph it should raise to the top to become completely visible.
XML	
3	Design an XML document to store information about patience in a hospital. Information about patients must include name (in 3 parts, first name, middle name, last name), social security number (SSN), age, room number, primary insurance company – including member identification number, group number and address – secondary insurance company (in the same sub parts as for the primary insurance company), known medical problems, and known drug allergies. Both attributes and nested tags must be included. Make up sample data of atleast 4 patients. Create a CSS style sheet for the above XML document and use it to create a display of that document.
4	Create the XSLT style sheet to format all the patient elements of the XML, document of exercise 3 and use it to create a display of whole element.
PHP- Write, test and debug PHP scripts for the following specification	
5	<p>Write an XHTML document to include an anchor tag, that calls a PHP document also write the called PHP document which returns a randomly chosen greeting from a list of five different greetings. The greetings must be stored as constant strings in the script. A random number between 0 and 4 can be computed with these line.</p> <pre>#set the seed for mtrand with the number of microseconds #since the last full second of the clock mt_strand((double) microtime() * 1000000); \$number=mtrand(0,4); #computes a random integer 0-4</pre> <p>Write the PHP script for above to count the number of visitors and display that number for each visitor. Hint: Use a file to store current count.</p>
6	<p>Write the XHTML code using JavaScript Object Notation (JSON) to create the form with the following capabilities</p> <ol style="list-style-type: none"> A text widget to collect the users name Four check boxes, one each for the following items <ol style="list-style-type: none"> Four 100 watt light bulbs for Rs. 20=39 Eight 100 watt light bulbs for Rs 40=20 Four 100 watt long life light bulbs for Rs. 30=95 Eight 100 watt long life light bulbs for Rs 70=49 A collection of 3 radio buttons that are labeled as follows <ol style="list-style-type: none"> Visa Master Card Discover <p>Write a PHP script that computes the total cost of the ordered light bulbs for the above program after adding 13.5% VAT. The program must inform the buyer of</p>

	exactly what was ordered in table.
7	Write a XHTML code to provide a form that collects names and telephone numbers. The phone numbers must be in the format ddd-ddd-dddd. Write a PHP script that checks the submitted telephone number to be sure that it confirms to the required format and then returns a response that indicates whether the number was correct.
8	Write the XHTML code using JavaScript Object Notation (JSON) to accept from the user name, phone no, mail-id, stored in database. Retrieve same information from database using a separate PHP script.
Java Servlets and JSP	
9	Write a servlet that returns a randomly chosen greeting from a list of five different greetings. The greeting must be stored as constant strings in the program.
10	Write a servlet for the XHTML code of exercise 6 that computes the total cost of ordered light bulbs after adding 2% sales tax. The servlet must inform the buyer of exactly what was ordered in table.
11	Write and test a JSP document that displays the form of exercise 6 and produces the same response document as exercise 10.
12	Write a markup document to create a form that collects favourite popular songs, including the name of the song, the composer and the performing artist or group. This document must call a servlet when the form is submitted and another servlet to request a current list of survey results.
13	Create a simple Java web application using Servlet and JDBC
14	Open Ended exercise- Mini project using Responsive Web Design (RWD) concept. <i>Not for exam, but compulsory to be included in record.</i>

Reference

1. <http://www.tutorialspoint.com>
2. <http://www.w3schools.com/>
3. Programming the World Wide Web, 7th edition, Robert W. Sebesta, Pearson Education, ISBN- 9789332518827
4. Web Programming – Building Internet Applications, 3rd edition, Chris Bates, Wiley publisher
5. Web Technologies— HTML, JavaScript, PHP, Java, JSP, ASP.Net, XML & Ajax – Black Book, Wiley, ISBN : 978-81-7722-997-4

Suggested list of student activities

Note: the following activities or similar activities for assessing CIE (IA) for 5 marks (Any one)
Student activity like mini-project, surveys, quizzes. Activity should be done individually.

1. Each individual student should do any one of the following type activity or any other similar activity related to the course and before conduction, get it approved from concerned course co-ordinator and programme co-ordinator.
2. Each student should conduct different activity and no repeating should occur.

1	Make presentation on latest web designing softwares.
2	Demonstrate any application using word press or joomla.
3	Quiz

Course Delivery

The course will be delivered through Demonstration and Practices

Course Assessment and Evaluation Scheme

Method	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE (Continuous Internal Evaluation)	IA	Students	Two tests (average of two tests)	10	Blue books	1,2,3,4,5
				Record	10	Report.	1,2,3,4,5
				Student activity.	05		
				Total	25		
	SEE (Semester End Examination)	End Exam		End of the course	50	Answer scripts at BTE	1,2,3,4,5
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1,2,3 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1,2,3, 4 & 5 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation

*SEE – Semester End Examination

Note:

1. I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.
2. Rubrics to be devised appropriately by the concerned faculty to assess Student activities.

Questions for CIE and SEE will be designed to evaluate the various educational components (Bloom's taxonomy) such as:

Sl. No	Bloom's Category	%
1	Remembrance	10
2	Understanding	20
3	Application	70

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

1. Blue books (10 marks)

2. Record (10 marks)
3. Student suggested activities report for 5 marks
4. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

Format for Student Activity Assessment

DIMENSION	Unsatisfactory 1	Developing 2	Satisfactory 3	Good 4	Exemplary 5	Score
Collection of data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collects some basic information; refer to the topic	Collects relevant information; concerned to the topic	Collects a great deal of information; all refer to the topic	3
Fulfill team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs all duties	Performs all duties of assigned team roles with presentation	4
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Does the assigned job without having to be reminded.	Always does the assigned work without having to be reminded and on given time frame	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Listens, but sometimes talk too much	Listens and contributes to the relevant topic	Listens and contributes precisely to the relevant topic and exhibit leadership qualities	3
TOTAL						13/4=3.25=4

Note: This is only an example. Appropriate rubrics/criteria may be devised by the concerned course co-ordinator for assessing the given activity.

Scheme of Valuation for End Examination

SN	Particulars	Marks
1	Writing one program from Java scripting or XHTML or XML	10
2	Writing one program from PHP or Java Servlets and JSP	10
3	Executing any one program with result.	20
4	Viva Voce	10
Total		50

***Evaluation should be based on the screen output only. No hard copy required.*

***Change of question is allowed only once. Marks of 05 should be deducted in the given question.*

Resource requirements for Web Programming Lab

(For an Intake of 60 Students [3 Batches])

Sl. No.	Equipment	Quantity
1	PC systems (latest configurations with speakers)	20
2	Laser Printers	01
3	Networking (Structured) with CAT 6e / wireless 24 Port switches / Wireless Router I/O Boxes for networking(as required)	03
4	Broad Band Connection	01


***Open Source Software should be encouraged*

MODEL QUESTION BANK

Sl.No	Practical/Exercise
	Dynamic Documents with Java Script
1	The document must have a paragraph of text that describes your home. Choose atleast three different phrases (3 to 6 words) of this paragraph and make them change font, font style, color and font size when the mouse cursor is placed over them. Each of the different phrases must change to different fonts, font styles, colors and font sizes.
2	The document must contain four short paragraphs of text stacked on top of each other with only enough of each showing so that the mouse cursor can also be placed over some part of them. When the cursor is placed over the exposed part of any paragraph it should raise to the top to become completely visible.
	XML
3	Design an XML document to store information about patience in a hospital. Information about patients must include name (in 3 parts, first name, middle name, last name), social security number (SSN), age, room number, primary insurance company – including member identification number, group number and address – secondary insurance company (in the same sub parts as for the primary insurance company), known medical problems, and known drug allergies. Both attributes and nested tags must be included. Make up sample data of at least 4 patients. Create a CSS style sheet for the above XML document and use it to create a display of that document.
4	Create the XSLT style sheet to format all the patient elements of the XML, document of exercise 3 and use it to create a display of whole element.
	PHP
5	<p>Write an XHTML document to include an anchor tag, that calls a PHP document also write the called PHP document which returns a randomly chosen greeting from a list of five different greetings. The greetings must be stored as constant strings in the script. A random number between 0 and 4 can be computed with these line.</p> <pre>#set the seed for mtrand with the number of microseconds #since the last full second of the clock mt_strand((double) microtime() * 1000000); \$number=mtrand(0,4); #computes a random integer 0-4</pre> <p>Write the PHP script for above to count the number of visitors and display that number for each visitor. Hint: Use a file to store current count.</p>
6	<p>Write the XHTML code using JavaScript Object Notation (JSON) to create the form with the following capabilities</p> <ol style="list-style-type: none"> A text widget to collect the users name Four check boxes, one each for the following items <ol style="list-style-type: none"> Four 100 watt light bulbs for Rs. 20=39 Eight 100 watt light bulbs for Rs 40=20 Four 100 watt long life light bulbs for Rs. 30=95 Eight 100 watt long life light bulbs for Rs 70=49 A collection of 3 radio buttons that are labeled as follows <ol style="list-style-type: none"> Visa Master Card Discover <p>Write a PHP script that computes the total cost of the ordered light bulbs for the above program after adding 13.5% VAT. The program must inform the buyer of</p>

	exactly what was ordered in table.
7	Write a XHTML code to provide a form that collects names and telephone numbers. The phone numbers must be in the format ddd-ddd-dddd. Write a PHP script that checks the submitted telephone number to be sure that it confirms to the required format and then returns a response that indicates whether the number was correct.
8	Write the XHTML code using JavaScript Object Notation (JSON) to accept from the user name, phone no, mail-id, stored in database. Retrieve same information from database using a separate PHP script.
	Java Servlets and JSP
9	Write a servlet that returns a randomly chosen greeting from a list of five different greetings. The greeting must be stored as constant strings in the program.
10	Write a servlet for the XHTML code of exercise 6 that computes the total cost of ordered light bulbs after adding 2% sales tax. The servlet must inform the buyer of exactly what was ordered in table.
11	Write and test a JSP document that displays the form of exercise 6 and produces the same response document as exercise 10.
12	Write a mark-up document to create a form that collects favorite popular songs, including the name of the song, the composer and the performing artist or group. This document must call a servlet when the form is submitted and another servlet to request a current list of survey results.
13	Create a simple Java web application using Servlet and JDBC

Government of Karnataka
Department of Technical Education
Bengaluru

	Course Title: Design and Analysis of Algorithms Lab		
	Scheme (L:T:P) : 0:2:4	Total Contact Hours: 78	Course Code: 15CS56P
	Type of Course: Tutorial and Practical's	Credit :03	Core/ Elective: Core
CIE- 25 Marks		SEE- 50 Marks	

Prerequisites

Knowledge of Data Structures.

Course Objectives

1. Write sorting programs using Divide-and-Conquer techniques.
2. Implement to find the minimum cost spanning tree and shortest path using different Greedy techniques.
3. Construct DFS, BFS programs and topological ordering using Decrease-and-Conquer technique.
4. Implement knapsack, travelling salesperson

Course Outcome

On successful completion of the course, the students will be able to attain CO:

Course Outcome		Experiment linked	CL	Linked PO	Teaching Hrs
CO1	Demonstrate Quick sort and Merge sort and calculate the time required to sort the elements.	1,2	U,A,AL	1,2,3,4,6,7,8,9,10	12
CO2	Implement the topological ordering of vertices, travelling salesman problem and Knapsack problem.	3 to 5	U,A	1,2,3,4,6,7,8,9,10	18
CO3	Construct programs to check graph is connected or not using BFS and DFS methods	6,7	U,A,AL	1,2,3,4,6,7,8,9,10	15
CO4	Implement programs on divide and conquer, decrease and conquer	8,9	U,A,AL	1,2,3,4,6,7,8,9,10	15
CO5	Experiment finding the minimum cost of spanning tree using Prim's algorithms and shortest path using Dijkstra' algorithm.	10,11	U,A,AL	1,2,3,4,6,7,8,9,10	18
			Total sessions		78

Legends: R = Remember U= Understand; A= Apply AL=Analyze E=Evaluate and above levels (Bloom's revised taxonomy)

Course-PO Attainment Matrix

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
Design and Analysis of Algorithms Lab	3	3	3	3	-	3	3	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

List of Graded Practical Exercises

Sl.No	Practical/Exercise
1	Sort a given set of elements using the Quick sort method and determine the time required to sort the elements. Repeat the experiment for different values of n.
2	Sort a given set of elements using merge sort method and determine the time required to sort the elements. Repeat the experiment for different of values of n.
3	Write a program to obtain the topological ordering of vertices in a given digraph.
4	Implement travelling salesman problem.
5	Implement the knapsack problem (0/1).
6	Print all the nodes reachable from a given starting node in a digraph using BFS method.
7	Check whether a given graph is connected or not using DFS method.
8	Write a program to implement binary search using divide and conquer technique
9	Write a program to implement insertion sort using decrease and conquer technique
10	Find minimum cost spanning tree of a given undirected path using a Prim's algorithm.
11	From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.

Note: Use any programming tools like C/Java/Python to execute the above exercises.

Reference

1. **Introduction to the Design and Analysis of Algorithms**, 3rd edition, Anany Levitin, Pearson Publication, ISBN: 9789332583771

Suggested list of student activities

Note: the following activities or similar activities for assessing CIE (IA) for 5 marks (Any one)

1. Each student should conduct different activity and no repeating should occur.

1.	Using C/Java/Python, build and execute any one of the unsolved exercise given at the end of each chapter of the reference text.
----	---

Course Delivery

The course will be delivered through Demonstration and Practices

Course Assessment and Evaluation Scheme

Method	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment	CIE (Continuous Internal Evaluation)	IA	Students	Two tests (average of two tests)	10	Blue books	1,2,3,4,5
				Record	10	Report.	1,2,3,4,5
				Student activity.	05		
				Total	25		
	SEE (Semester End Examination)	End Exam		End of the course	50	Answer scripts at BTE	1,2,3,4,5
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1,2,3 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1,2,3, 4 & 5 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation

*SEE – Semester End Examination

Note:

1. I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.
2. Rubrics to be devised appropriately by the concerned faculty to assess Student activities.

Questions for CIE and SEE will be designed to evaluate the various educational components (Bloom's taxonomy) such as:

Sl. No	Bloom's Category	%
1	Remembrance	10
2	Understanding	30
3	Application	30
4	Analysis	30

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

1. Blue books (10 marks)
2. Record (10 marks)
3. Student suggested activities report for 5 marks
4. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

Format for Student Activity Assessment

DIMENSION	Unsatisfactory 1	Developing 2	Satisfactory 3	Good 4	Exemplary 5	Score
Collection of data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collects some basic information; refer to the topic	Collects relevant information; concerned to the topic	Collects a great deal of information; all refer to the topic	3
Fulfill team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties	Performs nearly all duties	Performs all duties	Performs all duties of assigned team roles with presentation	4
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Does the assigned job without having to be reminded.	Always does the assigned work without having to be reminded and on given time frame	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Listens, but sometimes talk too much	Listens and contributes to the relevant topic	Listens and contributes precisely to the relevant topic and exhibit leadership qualities	3
TOTAL						13/4=3.25=4

Note: This is only an example. Appropriate rubrics/criteria may be devised by the concerned course co-ordinator for assessing the given activity.

Scheme of Valuation for End Examination

SN	Particulars	Marks
1	Record	05
2	Writing two programs	20
3	Execution of any one program	15
4	Viva Voce	10
Total		50

***Evaluation should be based on the screen output only. No hard copy required.*

***Change of question is allowed only once. Marks of 05 should be deducted in the given question.*

Resource requirements for Design and Analysis of Algorithms Lab


(For an Intake of 60 Students [3 Batches])

Sl. No.	Equipment	Quantity
1	PC systems (latest configurations with speakers)	20
2	Laser Printers	01
3	Networking (Structured) with CAT 6e / wireless 24 Port switches / Wireless Router I/O Boxes for networking(as required)	03
4	Broad Band Connection	01

MODEL QUESTION BANK

1	Sort a given set of elements using the Quick sort method and determine the time required to sort the elements. Repeat the experiment for different values of n.
2	Sort a given set of elements using merge sort method and determine the time required to sort the elements. Repeat the experiment for different of values of n.
3	Write a program to obtain the topological ordering of vertices in a given digraph.
4	Implement travelling salesman problem.
5	Implement the knapsack problem (0/1).
6	Print all the nodes reachable from a given starting node in a digraph using BFS method.
7	Check whether a given graph is connected or not using DFS method.
8	Write a program to implement binary search using divide and conquer technique
9	Write a program to implement insertion sort using decrease and conquer technique
10	Find minimum cost spanning tree of a given undirected path using a Prim's algorithm.
11	From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.

Government of Karnataka
Department of Technical Education
Board of Technical Examinations, Bangalore

	Course Title: PROFESSIONAL PRACTICES (Computer Science)		
	Scheme (L:T:P) : 0:2:4	Total Contact Hours: 78	Course Code:15CS57P
	Type of Course: Assignment Group talk and Practice	Credit :03	Core/ Elective: Core(practice)
CIE- 25 Marks			SEE- 50 Marks

PREREQUISITES

Enthusiasm to Explore New things by taking individual tasks and acquires skills from participating in group activities.

COURSE OBJECTIVES

To meet the industrial requirements and practices, the course introduces the students to various personality development skills through communication, group discussions, listening and technical skills through guest lectures and Presentations.

COURSE OUT COME

On successful completion of the course, the students will be able to:

Course Outcome		CL	Linked activity	Linked PO	Teaching Hrs
CO1	Recognize ethical responsibilities with respect to community, society, discipline and profession through oral communication skills	Analysis	1	2-10	15
CO2	Search the information related to topic, and acquire knowledge of contemporary issues related to advancements in Computer Science engineering.	Application/analysis	2	2-10	15
CO3	Discuss & disseminate about advancements in related profession including societal, environmental	Innovative/Analysis	3	2-10	15
CO4	Demonstrate the ability to analyse a problem and communicate competently in groups.	Application	4	2-10	18
CO5	Exposure to various industry environment practice and global, societal, economic, and/or environmental issues, by listening experts talks and interact with them and make a presentation	Analysis/Creation	5	2-10	15
Total					78

COURSE-PO ATTAINMENT MATRIX

Course	Programme Outcomes									
	1	2	3	4	5	6	7	8	9	10
PROFESSIONAL PRACTICES	0	3	3	3	3	3	3	3	3	3
<p>Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed. Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO. If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3 If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2 If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1 If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.</p>										

I. Communication skills

15 HRS

Communication Today

- Introduction
- Significance of Communication
- GSC's 3M Model of Communication: A Simple Approach
- Vitality of the Communication Process
- Virtues of Listening
- Fundamentals of Good Listening
- Nature of Non-Verbal Communication
- Need for Intercultural Communication
- Communication in a Digital World

Ref: Soft Skills: An Integrated Approach to Maximize Personality, Gajendra Singh Chauhan, Sangeeta Sharma, Wiley India, ISBN: 9788126556397

Method of achieving task: Practice in pairs through role play

Suggested activities:

1. Telephonic conversation of a customer and supplier.
2. A computer product show room sales person and a customer.
3. Negotiation between marketing representative of a computer firm and a technical representative at a polytechnic

Standards to be met:

- Given a telephone number, a student must be able to call and gather information from the person, sustaining the conversation for about 3 min using proper etiquettes and report on the enquiry made about the product or service. [e.g., call a toll free number to ask details about a product or service]
- Given a situation, a student must be able to talk to a person face to face in simulation, gather information about a product, discuss about it and also negotiate with him in the specified time (here, time can be specified by the Course Coordinator as per the need).

II. Information Search and Data collection:

15 HRS

Information search can be done through manufacturer's catalogue, websites, magazines; books etc. *Following topics are suggested.*

1. Network Storage Devices
2. High – end computing servers
3. Print server devices
4. Indoor Wireless access points
5. Outdoor Wireless access points
6. Indoor Antennas and amplifiers
7. Indoor Antennas and amplifiers
8. LCD Projectors
9. LED Projectors
10. Monitors for high end graphics
11. Graphics Cards
12. Mobile devices – Tablets, Mobile phones etc.
13. Operating systems – Window, Linux, Android, Mac
14. Laptops
15. Desktops
16. CRM software's and tools
17. ERP software's
18. Any other relevant technical topic.

Method for conducting Graded activities

1. The student should individually select the topic, and search the information related to topic.
2. Comparisons related to make, model, configuration, speed, price etc.
3. The report is strictly hand written document to have knowledge of precise writing and report making based on data collection

III. Guest Lecturers / Workshops: To be organized Minimum Two, preferably one technical and one General

15 HRS

Experts / Professionals from different fields/industries are invited to deliver lectures at least TWO sessions in a semester. The topics may be selected by the teacher /industry expert to develop required skills.

Note: The ISTE student chapter/CCTEK/ Institute of engineers (Institute chapter)/ student clubs of polytechnic may be used as platform to conduct this activity.

1. Cloud computing
2. Expert systems
3. Hadoop
4. Go Programming
5. Haskell programming
6. Big Data
7. Python
8. Raspberry PI
9. Pollution control and E-waste management
10. Fire Fighting / Safety Precautions and First aids.
11. Computer Networking and Security.
12. Career opportunities,

13. Yoga Meditation,
14. Aids awareness and health awareness.
15. Interview Techniques.
16. Road safety
17. Environmental pollution & control.
18. Nanotechnology
19. Rapid prototyping
20. Programmable logic controllers
21. TQM
22. Any other areas identified by the course co-ordinator

Method for conducting Guest lectures

1. The teacher/ISTE student chapter convener should fix up the date for guest lecture
2. The HOD of the department should chair the event
3. The students of class allowed to participate in the session
4. Watch the talk and make the brief hand written report on the guest lecture delivered by each student as a part of Term work.
5. Make Audio/visual record of the guest lecture by using any smart devices
6. Opportunity should be provided for students for live Interaction with experts and record it on any one smart device.

IV. Group Discussion: (Four topics)

18 HRS

- Introduction
- Ambience / Seating Arrangement for Group Discussion
- Importance of Group Discussions
- Difference between Group Discussion, Panel Discussion and Debate
- Traits Evaluated in Group Discussions
- Types of Group Discussions
- Topic-based Group Discussion
- Case-based Group Discussion
- Tips for Successful Participation in Group Discussion
- Individual Traits

Ref: Soft Skills: An Integrated Approach to Maximise Personality, Gajendra Singh Chauhan, Sangeeta Sharma, Wiley India, ISBN: 9788126556397

The students shall discuss in group of six students. Some of the suggested topics are.
Minimum four topics to be discussed.

1. Polythene bags must be banned!
2. Do we really need smart cities?
3. E – Books or Printed books – what's your choice?
4. Is Face book for the attention – seeking and lazy people?
5. Globalization and its impact on Indian Culture.
6. Analytically evaluate the solutions to traffic problems
7. Global warming is caused more by developed countries
8. Rain forests help in maintaining the earth's ecosystem
9. Reservation for women would help the society

10. How to deal with terrorism
11. Water resources should be nationalized
12. Daughters are more caring than sons
13. NGOs - Do they serve people's interests?
14. Managers are born, not trained
15. Managerial skills learnt in the classroom
16. Women are good managers
17. India's growth rate is bridging gap between rich and poor.
18. Nuclear power is a safe source of energy
19. Electronic media vs. print media
20. Corruption is the price we pay for democracy
21. Multinational corporations: Are they devils in disguise?
22. Advertising is a waste of resources.
23. Privatization will lead to less corruption.
24. China market - a threat to Indian market
25. Technology Creates Income Disparities
26. India should be reorganized into smaller states.
27. Rising petrol prices - Govt. can control?
28. Smaller businesses and start-ups have more scope
29. Developing countries need trade, not aid.
30. Business and Ethics do not go together
31. Performance based bonuses for government employees should be welcomed
32. Depreciation of Indian Rupee has only negative impact on the economy
33. Gold: Best investment or a bursting bubble?
34. Freedom of press should exist
35. India needs a strong dictator
36. Media is a mixed blessing/How ethical is media?
37. Computer viruses are good
38. India should practice "Swadeshi"
39. The government should stop funding IIT's and IIM's
40. Food Bill - Is it really something India needs?
41. Will India really be the superpower of 21st century?
42. Quality is a myth in India.
43. China - A threat to India?
44. Indian villages - our strength or our weakness?
45. Mobile phones - requirement of the day.
46. Cursing the weather is bad farming
47. If you want peace, prepare for war
48. Education is a progressive way of discovering your ignorance.
49. Beauty contests degrade womanhood
50. Examinations - has it killed education?
51. The medium of teaching in schools should be English
52. A room without books is like a body without soul.
53. Educated Indians lack national commitment.
54. E-Learning is good for the education system and society
55. Any relevant topic

Methodology for conducting Group discussion/Seminar

1. The teacher will allot a topic for a group of six students
2. The teacher should give an introductory talk on Ways and rules to carry out group discussion

3. The students should ask to show interest with others and work effectively with them to meet common objective. The teacher should provide tips to accept feedback in a constructive and considerate way and how to handle frustrations in group, while discussion.
4. The placement officer and any other senior faculty of the institute/ HOD of other department should be invited and they should act as observing members, apart from teacher
5. The teacher should fix up the time duration for initiating and conducting the activity
6. Documentation to be produced for validation
 - Hand written document on minutes of discussion, description of the topic discussed
 - Record the few minutes of discussion by smart device

V. Professional Presentation **15 HRS**

- Nature of Oral Presentation
- Planning a Presentation
- Preparing the Presentation
- Delivering the Presentation

Ref: Soft Skills: An Integrated Approach to Maximize Personality, Gajendra Singh Chauhan, Sangeeta Sharma, Wiley India, ISBN: 9788126556397

- *Carry out the presentation in activity No. 2 i.e Information search and Data Collection. Student should carry out the presentation individually.*

Course Delivery:

The course will be delivered through discussions and activities

Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment method	CIE	IA	Students	Each activities @5 marks each	25	Assessment report for each activity.	1,2,3,4,5
				End of the course	50	Answer scripts at BTE	1,2,3,4,5
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1,2,3 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1,2,3, Effectiveness of Delivery of instructions & Assessment Methods

Note to IA verifier: The following documents to be verified by CIE verifier at the end of semester

1. Student activities report for 25 marks.
2. Student feedback on course regarding Effectiveness of Delivery of instructions & Assessment Methods.

Scheme of Valuation for End Examination

SN	Description	Marks
1	One oral practices exercise on Communication skills	10
2	Report and Presentation on Information Search and Data Collection	20
3	Report on guest lecturers/Seminars conducted	10
4	One oral practices exercise on Group Discussion	10
Total		50

Note:


1. The records of the activities should be preserved in the department for minimum three years.
2. The examiner should verify these records to prevent duplication of the activity.

MODEL OF RUBRICS /CRITERIA FOR ASSESSING STUDENT ACTIVITY

RUBRICS FOR ACTIVITY						
Dimension	Unsatisfactory	Developing	Satisfactory	Good	Exemplary	Student Score
	1	2	3	4	5	
Collection of data	Does not collect any information relating to the topic	Collects very limited information; some relate to the topic	Collect much information; but very limited relate to the topic	Collects some basic information; most refer to the topic	Collects a great deal of information; all refer to the topic	Ex: 4
Fulfil team's roles & duties	Does not perform any duties assigned to the team role	Performs very little duties but unreliable.	Performs very little duties	Performs nearly all duties	Performs all duties of assigned team roles	5
Shares work equally	Always relies on others to do the work	Rarely does the assigned work; often needs reminding	Usually does the assigned work; rarely needs reminding	Normally does the assigned work	Always does the assigned work without having to be reminded.	3
Listen to other Team mates	Is always talking; never allows anyone else to speak	Usually does most of the talking; rarely allows others to speak	Talks good; but never show interest in listening others	Listens, but sometimes talk too much	Listens and speaks a fair amount	2
Average / Total marks=(4+5+3+2)/4=14/4=3.5=4						

Note: This is only an example. Appropriate rubrics/criteria may be devised by the concerned Course Coordinator for assessing the given activity

Government of Karnataka
Department of Technical Education
Bengaluru

	Course Title: Project Work Phase-I		
	Scheme (L:T:P) : 0:1:2	Total Contact Hours: 39	Course Code: 15CS58P
	Type of Course:	Credit :-	Core/ Elective: Core
CIE- 25 Marks		SEE- At the end of sixth semester	

Prerequisites

Knowledge of tools used for Problem Solving.

Course Objectives:

1. The objective of this project is to provide opportunity for the students to implement their skills acquired in the previous semesters
2. Make the students come up with innovative/ new ideas in their area of interest.
3. Identify, analyze and develop opportunities to solve process related problems.
4. Enhance students' to appreciate the values of social responsibility, legal and ethical principles, through analysis and discussion of relevant articles and real time projects.

Course outcome

On successful completion of the course, the students will be able to:

Course Outcome		CL	Linked PO	Allotted hours
CO1	Get an idea and confidence in designing, analyzing and executing the project.	Analysis/creation	1, 2.	3hrs/Week
CO2	Apply the knowledge of latest trends in process execution.	Analysis/creation	1 to 10	
CO3	Prepare document in team and enhance the students' written and oral communication.	Analysis/creation	1 to 10	
CO4	Develop individual confidence to handle various engineering assignments and expose themselves to acquire life skills to meet social challenges	Analysis/creation	1 to 10	
TOTAL				39

MAPPING COURSE OUTCOMES WITH PROGRAM OUTCOMES

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PROJECT WORK-I	3	3	3	3	3	3	3	3	3	3
Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed. Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO. If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3 If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2 If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1 If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.										

As far as possible students should be given application oriented project problems with a view to:

1. Develop an understanding regarding the size and scale of operations and nature of field work in which students are going to play their role after completing the course of study in Computer Science & Engineering.
2. Develop an understanding of subject based knowledge given in the classroom in the context of its application at work places.
3. Provide hands on experience to develop confidence amongst the students to enable them to use and apply acquired technical knowledge and skills.
4. Develop special skills and abilities like interpersonal skills, communication skills, attitudes and values.
5. Practical exposure to an industrial activity

Each Project batch must have Maximum of 4 students.

Effort should be made to identify actual field problems to be given as project work to the students. Project selected should not be too complex which is beyond the comprehension level of the students. The placement of the students for such a practical cum project work should match with the competency profile and interest of students.

Students may be assessed as per the suggested performance criteria given below:

- a) Punctuality and regularity (**Log book - mandatory and to be produced during IA verification**)
- b) Initiative in learning / Demonstration and design of model (DFD, Algorithms, ER diagrams, Flow Charts etc)
- c) Level / proficiency of practical skills acquired
- d) Originality
- e) Scope for patentability
- f) Sense of responsibility
- g) Self expression/Communication skills
- h) Interpersonal skills.
- i) Report writing skills
- j) Viva voce

The Project Report should consist of following items.

1. Selection of project and feasibility of study
2. Preparation of synopsis.
3. Market survey, cost and estimation of project

GUIDELINES FOR THE PREPARATION OF SYNOPSIS

Project reports should be typed neatly in Times New Roman letters with font size 14 for titles and 12 for text on both sides of the paper with 1.5 line spacing on a A4 size paper (210 x 297 mm). The margins should be: Left - 1.5", Right - 1", Top and Bottom - 0.75".

Format of Synopsis

1. Title
2. Objective
3. Problem definition
4. Methodology (DFD, Algorithms etc.)
5. Software/Tools
6. References

ROADMAP FOR PROJECT GUIDES

1. The project work is proposed to be carried out during the V and VI semesters so that learners prepare during the V semester, do some field work based on the preparation during the mid semester vacation and report the analysis and inferences during the VI semester.
2. The learners would reach a level of maturity by the time they reach V semester and so a meaningful project lasting for a year can be executed by them.
3. To execute the project with involvement needs constant guidance and monitoring of the progress of the learners by the guide.
4. This does not mean teacher has to advice learners.
5. Be confident about the ability of the learner and “intellectually provoke” them with challenging questions. These questions should prompt the learners to search information and update themselves (to be carried out during the first two weeks).
6. Do not feed information to learners. Instead crate a ‘cognitive dissonance’ (a challenging question or situation that the learner is not able to find an immediate answer but feels the need to search for information to find a solution).
7. Defer judgement on learners and give them identified sources if required like a journal article, book or a web site.
8. Even if the learners report their inability to solve do NOT give or prescribe a solution.
9. Be patient and give time for the learner to construct his knowledge.

10. Give corrective feedback to the learner by challenging his solutions so that his logic is questioned and it develops further.
11. This leads to the first activity viz., literature survey and conceiving a project.
12. During this phase meet the project team in a group and create a healthy competition among the learners to search different sources and synthesise their findings in the group.
13. Aim for bringing out a workable innovative project conceived within the first eight weeks as given in the schedule attached.
14. During these two phases and the third phase the teacher should assess the strengths and weakness of the members of the group and allocate differential work to team members on the remaining tasks to be carried out during the next thirty weeks.
15. This is to ensure active participation of all the members of the team.
16. By the end of the twelfth week finalise the project and a schedule of further activities for each member indicating the time frame in which his activities are to be executed may be made ready. A soft copy of this schedule may be collected from each learner by the guide to follow up.
17. This schedule prepared by each learner need to be documented for checking further progress of the project.
18. The next few phases of the project may require active guidance of the guide especially regarding the sources of collecting data, if a sample data is to be collected the number of units has to be decided, collating the data/fabricating, tryout/analysis and finally coming out with meaningful conclusions or models or application.
19. Data like models, designs, technical specifications, source code, protocols and original records need be collected from one authentic source as there will not be any variation. The teacher may guide the learners to authentic source.
20. Data having limited variability like product/service quality, processes and standards, procedures need to be collected from a sample as there is a variation. The number of units from whom (source) the data is to be collected is called sample. The sample needs to be representative of the expected variation. The decision on the size of the sample and the number of units need guidance from the teacher. For example, data regarding the quality of a product/service need be collected from 3 to 5 personnel at different levels of a service provider or dealers of a product. The numbers given are suggestive but a guide based on his experience has to make valid suggestions.
21. Data having a wide range of variation like customer satisfaction where the customers are members of the public need a larger number of units to accommodate the diversity. A tool like questionnaire with predetermined questions need to be prepared,

tried out on a small sample and finalise the questions. Data may be collected from at least 30 units. This number is suggested to apply statistical analysis for meaningful conclusions. Guides may decide on the sample size depending on the accessibility of data.

22. The intention of the above three points viz., 19, 20 and 21 is to ensure objectivity in data collection i.e., to reduce the subjectivity of the human mind.
23. All the above activities need to be completed before three to four weeks before the end of V semester (refer the spread sheet related to scheduling).
24. The learners may be instructed to collect data objectively with identified sample during the next 4 to six weeks which includes the mid semester holidays. This would enable the learners to visit the field and collect data without the constraint of reporting to institution and attending classes on a regular basis.
25. The collected data need to be organised and entered to spread sheets or similar formats for analysis. Qualitative data may be converted to quantitative using a rating scale or similar data organisation procedures.
26. The result of most analysis on spreadsheet could be obtained in tables or graphs as per the requirement.
27. Activities mentioned in points 24, 25 and 26 may be carried out by learners during 4 to 8 weeks after commencement of VI semester.
28. Interpretation of the analysed tables and graphs to arrive at meaningful inference. The guide at this stage may defer his ideas on interpretation allowing the learners to do this. In case the learners err in the process they may be given corrective feedback.
29. A report of the whole process of doing the project may be written, word processed and submitted in triplicate.
30. Guides may contact industries and try to solve their problems so that the learners get a field experience and they get ready for the industry.
31. Innovations and innovative practices may be encouraged among the learners to be pursued as a project. Developing prototypes, (in simulation or real) trying out feasibility of new ideas, changing existing systems by adding modules, combining, assembling new modules and developing new systems may be given higher priority over routine bookish projects.
32. The schedule of events proposed is for an investigative project as a model. Guides may alter the prescribed schedule to suit the kind of innovative projects sited in point No.31 above.

33. Concerned guide may be involved in conceiving, executing and evaluating projects. This gives credibility to the institute.

GUIDELINES TO LEARNERS TO CARRY OUT A TWO SEMESTER PROJECT

1. Carry out the project work through the V and VI semesters. Preparation must be done during the V semester and based on this, field work should be done during the mid semester vacation and reporting of analysis and inferences should be done in the VI semester.
2. You have the ability and the level of maturity needed to conceive an innovative and meaningful project accomplishing which gives you recognition by the industry and empowers you with the power of knowledge.
3. Understand your strength and weakness and make an effort to find the strength and weakness of other peers in the team.
4. Complement each other's strength rather than compete with peers within the team. This will enable you to complete a comprehensive and innovative project relevant to the industrial needs rather than doing a routine copy of what others have done.
5. Seek guidance from the course coordinator and update him/her about the progress.
6. Be confident about your ability and that of other members of your group. Take extra efforts to collect information, share with your peers and synthesise your knowledge.
7. Question everything including the ideas of your course coordinator. Accept the ideas and instructions which are internally consistent (logical).
8. Involve actively in group activities and contribute towards the tasks.
9. Do not depend too much on the course coordinator as a source of information, search on your own and build your knowledge structure. Search for authentic sources like journal articles, books and authentic sites rather than blogs and tweets.
10. Though brief, record your thoughts and activities including searches immediately.
11. Prepare a schedule for your work on a spread sheet and encourage your peers to do the same.
12. Show your schedule and that of others to the course coordinator and get his feedback.
13. Keep reviewing the schedule every fortnight and take corrective steps if needed. For doing this keep the general guideline schedule given in the curriculum as a backdrop.

14. Tools used for data collection like instruments, testing machines, questions to be asked and software may be tried out and standardised by the twelfth week of the project. Seek the course coordinator's help who is experienced in doing this.
15. Collect data dispassionately or objectively (without applying your personal prejudice). Complete this task before the VI semester begins.
16. While entering data into the spread sheet ask your peer member to verify. This will ensure accuracy of data entry.
17. Use appropriate mathematics/statistics for calculations. Seek help from external sources (other than your course coordinator) if required.
18. The results of your analysis need to be graphically represented and documented. You may also add photographs and video clips to increase the validity.
19. This task needs to be completed within 8 weeks after commencement of VI semester.
20. Interpret the data (after analysis) and arrive at meaningful inferences on your own in discussion with your peers. Get it ratified by your course coordinator. Suggestions from the course coordinator may be discussed among your peers and incorporated if they are internally consistent.
21. The project report may be word processed (videos, photographs attached in soft copy) and submitted in triplicate two weeks before the end of VI semester.
22. Involve passionately in the team work, make constructive contributions and come out with an industry friendly project which will equip you in your professional development.

Unit No	Unit Name	Hour
I	Introduction	03
II	Review of Literature.	16
III	Study Area.	13
IV	Result and Discussion.	07
	TOTAL	39

COURSE ASSESSMENT & EVALUATION

Method	What		To whom	When/Where (Frequency in the course)	Max Marks	Evidence collected	Course outcomes
Direct Assessment method	CIE	IA	Students	Active participation of student in doing project work	25	Log of activities / Review of project report	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	Middle of the course		Feedback forms	1,2,3 Delivery of course
	End of Course Survey			End of the course		Questionnaires	1,2,3,4,5,6 Effectiveness of Delivery of instructions

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Remembering and Understanding:	- 10% weightage
Applying the knowledge acquired from the course:	- 30 % weightage
Analysis:	- 20% weightage
Evaluation:	- 5% weightage
Creating new knowledge:	- 35% weightage

STAGES OF PROJECT REVIEW IN 5TH SEMESTER

Review	End of - Week	Activity
I Review	6	Presentation of (a) Project Synopsis, (b) Methodology of work to be carried out
II Review	13	Collection of Preliminary data related to Project work

All students of 5th Semester should compulsorily attend each Review Proceedings of the meeting should be maintained in the department and shown during CIE verification.

CIE SCHEME OF EVALUATION

SN	Particulars	Marks
1	Log Activity	05
2	Synopsis	10
3	Presentation	10
Total		25

PROJECT-TIME LINE

SL.No	Task	Responsibility	V Semester				VI Semester						
			1 to 2	3	4 to 6	7 to 14	1	2 to 3	4	5 to 10	11 to 12	13	14
1	Seminar regarding Project work	HOD / Co-ordinator											
2	Batch formation & Guide allocation	HOD											
3	Identification of project	Students / Guide											
4	Project synopsis Submission	Students											
5	Finalizations of Project	Students / Guide											
6	Literature survey	Students / Guide											
7	Identification of facility to do PW	Guide											
8	Study & design of system and Phase 1 presentation	Students / Guide											
9	Results discussion / performance testing	Students											
10	Review of Project work by guide	Students											
11	Project report submission and Phase 2 presentation	Students / Guide											