



COURSE HANDOUT

PROGRAM : B.Tech., VI-Sem., CSE
ACADEMIC YEAR : 2018-19
COURSE NAME & CODE : WEB TECHNOLOGIES – S425
L-T-P STRUCTURE : 3-1-0
COURSE CREDITS : 3
COURSE INSTRUCTOR: N. SRINIVASARAO
COURSE COORDINATOR : N. SrinivasaRao
PRE-REQUISITE: C, C++, JAVA Languages

COURSE OBJECTIVE: On completion of this course, a student will be familiar with client server architecture and able to develop a web application using java technologies. Students will gain the skills and project-based experience needed for entry into web application and development careers

COURSE OUTCOMES (CO)

CO1: Understand the basic concepts of Web Design and create web pages with HTML & DHTML.

CO2: Apply basic concepts of XML, DOM & SAX and Java Beans to solve real world problems.

CO3: Design dynamic web pages using server side component Servlets.

CO4: Create real world web applications using JSP.

CO5: Apply Swings & Struts framework for application development.

COURSE ARTICULATION MATRIX (Correlation between COs&POs,PSOs):

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	1	3	-	2	1	-	-	-	-	-	1	3	-	-
CO2	2	2	3	-	2	1	-	-	-	-	-	1	3	1	-
CO3	2	2	3	-	2	1	-	-	-	-	-	1	3	3	-
CO4	2	2	3	-	2	1	-	-	-	-	-	1	3	3	1
CO5	2	2	3	-	2	1	-	-	-	-	-	1	3	3	1

Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put '-'
1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1	Chris Bates ,Web Programming, building internet applications, WILEY Dreamtech. (UNITS-1, 2, 3, 4) 2nd edition.
T2	Bill Siggelkow, S P D ,Jakarta Struts Cookbook , O'Reilly (UNIT-5)

BOS APPROVED REFERENCE BOOKS:

R1	Sebesta ,Programming world wide web, Pearson
R2	Marty - Hall and Larry Brown ,Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES , Pearson
R3	3. Dietel and Nieto ,Internet and World Wide Web , How to program by PHI/Pearson Education Asia.
R4	4. Sebesta, Programming world wide web, Java Server Pages, Pekowsky, Pearson.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A**UNIT-I: HTML, CSS, JAVASCRIPT AND DHTML**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction & COs explanation	1	19/11/2018		TLM1, TLM5	CO1	T1, R1	
2.	Introduction to HTML	1	22/11/2018		TLM1, TLM5	CO1	T1, R1	
3.	HTML basic tags: Text Formatting Tags, List tags and its types.	1	23/11/2018		TLM1, TLM5	CO1	T1, R1	
4.	Table Tags and its Attributes, Image Tag and its Attributes.	1	26/11/2018		TLM1, TLM5	CO1	T1, R1	
5.	Links - Internal & External Links Framesets - Nested Frames.	1	28/11/2018		TLM1, TLM5	CO1	T1, R1	
6.	HTML Form Elements and its attributes.	1	29/11/2018		TLM1, TLM5	CO1	T1, R1	
7.	Cascading Style Sheets: Explanation, Importance, Basics	1	30/11/2018		TLM1, TLM5	CO1	T1, R1	
8.	Types of Cascading Style Sheets	1	03/12/2018		TLM1, TLM5	CO1	T1, R1	
9.	Introduction to Java Script	1	05/12/2018		TLM1, TLM5	CO1	T1, R1	
10.	Usage of Objects in Java Script.	1	06/12/2018		TLM1, TLM5	CO1	T1, R1	
11.	Regular expressions in Java Script, Java Script Form Validation.	1	07/12/2018		TLM1, TLM5	CO1	T1, R1	
12.	TUTORIAL - 1	1	10/12/2018		TLM3	CO1	---	
13.	Assignment/Quiz-1	1	12/12/2018		TLM6	CO1	---	
No. of classes required to complete UNIT-I		13	No. of classes taken:					

UNIT-II: XML & JAVA BEANS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	XML Fundamentals	1	13/12/2018		TLM1, TLM5	CO2	T1, R1	

15.	Anatomy of Basic XML program	1	14/12/2018		TLM1, TLM5	CO2	T1, R1
16.	Well-formed ness and Validity of XML	1	17/12/2018		TLM1, TLM5	CO2	T1, R1
17.	Document type definition (DTD), its types with example programs.	1	19/12/2018		TLM1, TLM5	CO2	T1, R1
18.	XML Schema with examples.	1	20/12/2018		TLM1, TLM5	CO2	T1, R1
19.	Presenting XML using XSLT.	1	21/12/2018		TLM1, TLM5	CO2	T1, R1
20.	Using XML Processors: DOM and SAX with example programs.	1	24/12/2018		TLM1, TLM5	CO2	T1, R1
21.	Java Beans : Introduction to Java Beans	1	26/12/2018		TLM1, TLM5	CO2	T1, R1
22.	Java Beans API, persistence.	1	27/12/2018		TLM1, TLM5	CO2	T1, R1
23.	EJB's and its types	1	28/12/2018		TLM1, TLM5	CO2	T1, R1
24.	BDK with example programs	1	31/12/2018		TLM1, TLM5	CO2	T1, R1
25.	TUTORIAL-2	1	02/01/2019		TLM3	CO2	---
26.	Assignment/Quiz-2	1	03/01/2019		TLM6	CO2	---
No.of classes required to complete UNIT-II		13	No. of classes taken:				

UNIT-III: SERVLETS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
27.	Introduction to Web Servers and Servlets	1	25/01/2019		TLM1, TLM5	CO3	T1, R2	
28.	Lifecycle of a Servlet with example.	1	28/01/2019		TLM1, TLM5	CO3	T1, R2	
29.	The Servlet API, javax.servlet and javax.servlet.http packages.	1	30/01/2019		TLM1, TLM5	CO3	T1, R2	
30.	ServletConfig and ServletContext interfaces with example programs.	1	31/01/2019		TLM1, TLM5	CO3	T1, R2	
31.	RequestDispatcher Interface usage.	1	01/02/2019		TLM1, TLM5	CO3	T1, R2	
32.	Database interaction through Servlet Pages.	1	04/02/2019		TLM1, TLM5	CO3	T1, R2	
33.	Insertion, deletion and searching operations on database through servlet pages.	1	06/02/2019		TLM1, TLM5	CO3	T1, R2	
34.	Dynamic web application example.	1	07/02/2019		TLM1, TLM5	CO3	T1, R2	
35.	Http Request & Responses.	1	08/02/2019		TLM1, TLM5	CO3	T1, R2	
36.	Session Tracking with example program.	1	11/02/2019		TLM1, TLM5	CO3	T1, R2	
37.	Cookies concept with example program.	1	13/02/2019		TLM1, TLM5	CO3	T1, R2	

38.	TUTORIAL-3	1	14/02/2019		TLM3	CO3	---	
39.	Assignment/Quiz-3	1	15/02/2019		TLM6	CO3	---	
No. of classes required to complete UNIT-III		13	No. of classes taken:					

UNIT-IV: JSP

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
40.	Introduction to JSP	1	18/02/2019		TLM1, TLM5	CO4	T1, R2	
41.	Components of JSP and its life cycle.	1	20/02/2019		TLM1, TLM5	CO4	T1, R2	
42.	Scripting elements of JSP.	1	21/02/2019		TLM1, TLM5	CO4	T1, R2	
43.	JSP Implicit Objects.	1	22/02/2019		TLM1, TLM5	CO4	T1, R2	
44.	JSP Implicit Objects.	1	25/02/2019		TLM1, TLM5	CO4	T1, R2	
45.	Conditional Processing – Displaying Values in JSP.	1	27/02/2019		TLM1, TLM5	CO4	T1, R2	
46.	JSP Directive elements.	1	28/02/2019		TLM1, TLM5	CO4	T1, R2	
47.	Action elements in JSP.	1	01/03/2019		TLM1, TLM5	CO4	T1, R2	
48.	Declaring Variables and Methods, Error Handling and Debugging.	1	06/03/2019		TLM1, TLM5	CO4	T1, R2	
49.	Accessing Database through JSP pages, Simple JSP application.	1	07/03/2019		TLM1, TLM5	CO4	T1, R2	
50.	TUTORIAL-4	1	08/03/2019		TLM3	CO4	---	
51.	Assignment/Quiz-4	1	11/03/2019		TLM6	CO4	---	
No. of classes required to complete UNIT-IV		12	No. of classes taken:					

UNIT-V: Swings & Struts Framework

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
52.	Introducing Swing , key features of swings.	1	13/03/2019		TLM1, TLM5	CO5	T2, R1	
53.	Limitations of AWT, Components & containers	1	14/03/2019		TLM1, TLM5	CO5	T2, R1	
54.	JApplet, JFrame and JComponent	1	15/03/2019		TLM1, TLM5	CO5	T2, R1	
55.	Labels, text fields, buttons	1	18/12/2019		TLM1, TLM5	CO5	T2, R1	
56.	Tabbed Panes, Scroll Panes, Trees	1	20/03/2019		TLM1, TLM5	CO5	T2, R1	
57.	Introduction to Struts	1	21/03/2019		TLM1, TLM5	CO5	T2, R1	
58.	Overview of MVC Design Pattern	1	22/03/2019		TLM1, TLM5	CO5	T2, R1	
59.	Struts Controller components, Struts example programs	1	25/03/2019		TLM1, TLM5	CO5	T2, R1	
60.	TUTORIAL-5	1	27/03/2019		TLM3	CO5	---	
61.	Assignment/Quiz-5	1	28/03/2019		TLM6	CO5	---	

No. of classes required to complete UNIT-V	10	No. of classes taken:
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Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
62.	JDBC Introduction.				TLM1, TLM5	CO3, CO4	T1, R2	
63.	java.sql.* package explanation.				TLM1, TLM5	CO3, CO4	T1, R2	
64.	JDBC Programs.				TLM1, TLM5	CO3, CO4	T1, R2	

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions + CRT Classes	19-11-2018	12-01-2019	7 W + 1 W
Sankranti Holidays	13-01-2019	17-01-2019	5 D
I Mid Examinations	18-01-2019	24-01-2019	1 W
II Phase of Instructions	25-01-2019	30-03-2019	9 W
II Mid Examinations	01-04-2019	06-04-2019	1 W
Preparation and Practicals	08-04-2019	20-04-2019	2 W
Semester End Examinations	22-04-2019	04-05-2019	2 W

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5

Evaluation of Mid Marks: $B=75\%$ of $\text{Max}(B1,B2)+25\%$ of $\text{Min}(B1,B2)$	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

**Course
Instructor**

Course Coordinator

Module Coordinator

HOD

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAM OUTCOMES

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources,

and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering **and management principles and apply these to one's own work, as a member and** leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyze, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech., VI-Sem., CSE
ACADEMIC YEAR : 2018-19
COURSE NAME & CODE : WEB TECHNOLOGIES – S425
L-T-P STRUCTURE : 3-1-0
COURSE CREDITS : 3
COURSE INSTRUCTOR: P. Vamsi Naidu
COURSE COORDINATOR : N. SrinivasaRao
PRE-REQUISITE: C, C++, JAVA Languages

COURSE OBJECTIVE: On completion of this course, a student will be familiar with client server architecture and able to develop a web application using java technologies. Students will gain the skills and project-based experience needed for entry into web application and development careers

COURSE OUTCOMES (CO)

- CO1: Understand the basic concepts of Web Design and create web pages with HTML & DHTML.
CO2: Apply basic concepts of XML, DOM & SAX and Java Beans to solve real world problems.
CO3: Design dynamic web pages using server side component Servlets.
CO4: Create real world web applications using JSP.
CO5: Apply Swings & Struts framework for application development.

COURSE ARTICULATION MATRIX (Correlation between COs&POs,PSOs):

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
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CO2	2	2	3	-	2	1	-	-	-	-	-	1	3	1	-
CO3	2	2	3	-	2	1	-	-	-	-	-	1	3	3	-
CO4	2	2	3	-	2	1	-	-	-	-	-	1	3	3	1
CO5	2	2	3	-	2	1	-	-	-	-	-	1	3	3	1

Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put ‘-’
1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1	Chris Bates ,Web Programming, building internet applications, WILEY Dreamtech. (UNITS-1, 2, 3, 4) 2nd edition.
T2	Bill Siggelkow, S P D ,Jakarta Struts Cookbook , O'Reilly (UNIT-5)

BOS APPROVED REFERENCE BOOKS:

R1	Sebesta ,Programming world wide web, Pearson
R2	Marty - Hall and Larry Brown ,Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES , Pearson
R3	3. Dietel and Nieto ,Internet and World Wide Web , How to program by PHI/Pearson Education Asia.
R4	4. Sebesta, Programming world wide web, Java Server Pages, Pekowsky, Pearson.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A**UNIT-I: HTML, CSS, JAVASCRIPT AND DHTML**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction & COs explanation	1	19/11/2018		TLM1, TLM5	CO1	T1, R1	
2.	Introduction to HTML	1	22/11/2018		TLM1, TLM5	CO1	T1, R1	
3.	HTML basic tags: Text Formatting Tags, List tags and its types.	1	23/11/2018		TLM1, TLM5	CO1	T1, R1	
4.	Table Tags and its Attributes, Image Tag and its Attributes.	1	26/11/2018		TLM1, TLM5	CO1	T1, R1	
5.	Links - Internal & External Links Framesets - Nested Frames.	1	28/11/2018		TLM1, TLM5	CO1	T1, R1	
6.	HTML Form Elements and its attributes.	1	29/11/2018		TLM1, TLM5	CO1	T1, R1	
7.	Cascading Style Sheets: Explanation, Importance, Basics	1	30/11/2018		TLM1, TLM5	CO1	T1, R1	
8.	Types of Cascading Style Sheets	1	03/12/2018		TLM1, TLM5	CO1	T1, R1	
9.	Introduction to Java Script	1	05/12/2018		TLM1, TLM5	CO1	T1, R1	
10.	Usage of Objects in Java Script.	1	06/12/2018		TLM1, TLM5	CO1	T1, R1	
11.	Regular expressions in Java Script, Java Script Form Validation.	1	07/12/2018		TLM1, TLM5	CO1	T1, R1	
12.	TUTORIAL - 1	1	10/12/2018		TLM3	CO1	---	
13.	Assignment/Quiz-1	1	12/12/2018		TLM6	CO1	---	
No. of classes required to complete UNIT-I		13	No. of classes taken:					

UNIT-II: XML & JAVA BEANS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	XML Fundamentals	1	13/12/2018		TLM1, TLM5	CO2	T1, R1	

15.	Anatomy of Basic XML program	1	14/12/2018		TLM1, TLM5	CO2	T1, R1
16.	Well-formed ness and Validity of XML	1	17/12/2018		TLM1, TLM5	CO2	T1, R1
17.	Document type definition (DTD), its types with example programs.	1	19/12/2018		TLM1, TLM5	CO2	T1, R1
18.	XML Schema with examples.	1	20/12/2018		TLM1, TLM5	CO2	T1, R1
19.	Presenting XML using XSLT.	1	21/12/2018		TLM1, TLM5	CO2	T1, R1
20.	Using XML Processors: DOM and SAX with example programs.	1	24/12/2018		TLM1, TLM5	CO2	T1, R1
21.	Java Beans : Introduction to Java Beans	1	26/12/2018		TLM1, TLM5	CO2	T1, R1
22.	Java Beans API, persistence.	1	27/12/2018		TLM1, TLM5	CO2	T1, R1
23.	EJB's and its types	1	28/12/2018		TLM1, TLM5	CO2	T1, R1
24.	BDK with example programs	1	31/12/2018		TLM1, TLM5	CO2	T1, R1
25.	TUTORIAL-2	1	02/01/2019		TLM3	CO2	---
26.	Assignment/Quiz-2	1	03/01/2019		TLM6	CO2	---
No.of classes required to complete UNIT-II		13	No. of classes taken:				

UNIT-III: SERVLETS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
27.	Introduction to Web Servers and Servlets	1	25/01/2019		TLM1, TLM5	CO3	T1, R2	
28.	Lifecycle of a Servlet with example.	1	28/01/2019		TLM1, TLM5	CO3	T1, R2	
29.	The Servlet API, javax.servlet and javax.servlet.http packages.	1	30/01/2019		TLM1, TLM5	CO3	T1, R2	
30.	ServletConfig and ServletContext interfaces with example programs.	1	31/01/2019		TLM1, TLM5	CO3	T1, R2	
31.	RequestDispatcher Interface usage.	1	01/02/2019		TLM1, TLM5	CO3	T1, R2	
32.	Database interaction through Servlet Pages.	1	04/02/2019		TLM1, TLM5	CO3	T1, R2	
33.	Insertion, deletion and searching operations on database through servlet pages.	1	06/02/2019		TLM1, TLM5	CO3	T1, R2	
34.	Dynamic web application example.	1	07/02/2019		TLM1, TLM5	CO3	T1, R2	
35.	Http Request & Responses.	1	08/02/2019		TLM1, TLM5	CO3	T1, R2	
36.	Session Tracking with example program.	1	11/02/2019		TLM1, TLM5	CO3	T1, R2	
37.	Cookies concept with example program.	1	13/02/2019		TLM1, TLM5	CO3	T1, R2	

38.	TUTORIAL-3	1	14/02/2019		TLM3	CO3	---	
39.	Assignment/Quiz-3	1	15/02/2019		TLM6	CO3	---	
No. of classes required to complete UNIT-III		13	No. of classes taken:					

UNIT-IV: JSP

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
40.	Introduction to JSP	1	18/02/2019		TLM1, TLM5	CO4	T1, R2	
41.	Components of JSP and its life cycle.	1	20/02/2019		TLM1, TLM5	CO4	T1, R2	
42.	Scripting elements of JSP.	1	21/02/2019		TLM1, TLM5	CO4	T1, R2	
43.	JSP Implicit Objects.	1	22/02/2019		TLM1, TLM5	CO4	T1, R2	
44.	JSP Implicit Objects.	1	25/02/2019		TLM1, TLM5	CO4	T1, R2	
45.	Conditional Processing – Displaying Values in JSP.	1	27/02/2019		TLM1, TLM5	CO4	T1, R2	
46.	JSP Directive elements.	1	28/02/2019		TLM1, TLM5	CO4	T1, R2	
47.	Action elements in JSP.	1	01/03/2019		TLM1, TLM5	CO4	T1, R2	
48.	Declaring Variables and Methods, Error Handling and Debugging.	1	06/03/2019		TLM1, TLM5	CO4	T1, R2	
49.	Accessing Database through JSP pages, Simple JSP application.	1	07/03/2019		TLM1, TLM5	CO4	T1, R2	
50.	TUTORIAL-4	1	08/03/2019		TLM3	CO4	---	
51.	Assignment/Quiz-4	1	11/03/2019		TLM6	CO4	---	
No. of classes required to complete UNIT-IV		12	No. of classes taken:					

UNIT-V: Swings & Struts Framework

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
52.	Introducing Swing , key features of swings.	1	13/03/2019		TLM1, TLM5	CO5	T2, R1	
53.	Limitations of AWT, Components & containers	1	14/03/2019		TLM1, TLM5	CO5	T2, R1	
54.	JApplet, JFrame and JComponent	1	15/03/2019		TLM1, TLM5	CO5	T2, R1	
55.	Labels, text fields, buttons	1	18/12/2019		TLM1, TLM5	CO5	T2, R1	
56.	Tabbed Panes, Scroll Panes, Trees	1	20/03/2019		TLM1, TLM5	CO5	T2, R1	
57.	Introduction to Struts	1	21/03/2019		TLM1, TLM5	CO5	T2, R1	
58.	Overview of MVC Design Pattern	1	22/03/2019		TLM1, TLM5	CO5	T2, R1	
59.	Struts Controller components, Struts example programs	1	25/03/2019		TLM1, TLM5	CO5	T2, R1	
60.	TUTORIAL-5	1	27/03/2019		TLM3	CO5	---	
61.	Assignment/Quiz-5	1	28/03/2019		TLM6	CO5	---	

No. of classes required to complete UNIT-V	10	No. of classes taken:
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Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
62.	JDBC Introduction.				TLM1, TLM5	CO3, CO4	T1, R2	
63.	java.sql.* package explanation.				TLM1, TLM5	CO3, CO4	T1, R2	
64.	JDBC Programs.				TLM1, TLM5	CO3, CO4	T1, R2	

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions + CRT Classes	19-11-2018	12-01-2019	7 W + 1 W
Sankranti Holidays	13-01-2019	17-01-2019	5 D
I Mid Examinations	18-01-2019	24-01-2019	1 W
II Phase of Instructions	25-01-2019	30-03-2019	9 W
II Mid Examinations	01-04-2019	06-04-2019	1 W
Preparation and Practicals	08-04-2019	20-04-2019	2 W
Semester End Examinations	22-04-2019	04-05-2019	2 W

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5

Evaluation of Mid Marks: $B=75\%$ of $\text{Max}(B1,B2)+25\%$ of $\text{Min}(B1,B2)$	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

**Course
Instructor**

Course Coordinator

Module Coordinator

HOD

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAM OUTCOMES

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources,

and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering **and management principles and apply these to one's own work, as a member and** leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyze, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

COURSE HANDOUT

PROGRAM : B.Tech., VI-Sem., CSE-A
ACADEMIC YEAR : 2018-19
COURSE NAME & CODE : ARTIFICIAL INTELLIGENCE-S137
L-T-P STRUCTURE : 3-1-2
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr.K.Venkateswara Rao
COURSE COORDINATOR :

PRE-REQUISITE: Knowledge of neural networks.

COURSE OBJECTIVE:

This course enables the students to know about

- ✓ This gives a clear view of analyzing AI problems, types of problems, Techniques of solving problems.
- ✓ It gives a clear view of knowledge, representation of knowledge, types of logic and its algorithms.
- ✓ This course is used to provide the description of agents and various types of agents and how they used to solve various AI problems.
- ✓ It provides a better understanding of uncertainty and certainty, its factors various theories of uncertainty and appropriate examples.
- ✓ It provides a clear view of state space in search, game playing procedures, expert systems and advanced concepts like swarm intelligent systems.

COURSE OUTCOMES (CO)

CO1	Analyze the design specifications for the structure of agents and distinguish among heuristic techniques.
CO2	Identify approaches and issues in knowledge representation and formulate propositional and predicate logic.
CO3	Formulate the logic of non-monotonic reasoning and apply the techniques in uncertainty domain.
CO4	Analyze the planning and learning techniques in state space search.
CO5	Formulate the design specification of game playing techniques, analyze expert systems, robotics and swarm intelligence systems.

COURSE ARTICULATION MATRIX(Correlation between COs&POs,PSOs):

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	-	-	-	-	-	-	-	-	1	2	-	-
CO2	3	2	1	-	-	-	-	-	-	-	-	1	1	-	-
CO3	1	3	2	1	-	-	-	-	-	-	-	1	1	-	-
CO4	2	3	2	1	-	-	-	-	-	-	-	1	1	-	-
CO5	2	3	2	-	-	-	-	-	-	-	-	1	1	-	-

Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put '-'
1- Slight (Low), **2** - Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1 Elaine Rich, Kevin Knight and Shivashankar B. Nair, "Artificial Intelligence", TMH, Third edition, 2009.

T2 Stuart J. Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", Pearson Education Asia, Second edition, 2003.

BOS APPROVED REFERENCE BOOKS:

R1 Rajendra Akerkar, "Introduction to Artificial Intelligence", PHI, 2005.

R2 Patrick Henry Winston, "Artificial Intelligence", Pearson Education Inc., Third edition, 2001.

R3 Eugene Charniak and Drew Mc Dermott, "Introduction to Artificial Intelligence", Addison-Wesley, ISE Reprint, 1998.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT –I: Introduction of Artificial Intelligence

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction of AI	1	22-11-18		TLM1,2	CO1	T1,T2,R1	
2.	History of AI	1	23-11-18		TLM1	CO1	T1,T2,R1	
3.	History of AI	1	24-11-18		TLM1	CO1	T1,T2,R1	
4.	Intelligent agents	1	28-11-18		TLM 1,2	CO1	T1,T2,R1	
5.	Structure of agents and its functions	1	29-11-18		TLM 1,2	CO1	T1,T2,R1	
6.	Problem spaces and search	1	30-11-18		TLM 1,2	CO1	T1,T2,R1	
7.	Problem spaces and search	1	01-12-18		TLM 1,2	CO1	T1,T2,R1	
8.	Heuristic Search Techniques	1	05-12-18		TLM1	CO1	T1,T2,R1	
9.	Best-first search	1	06-12-18		TLM1	CO1	T1,T2,R1	
10.	Problem reduction	1	07-12-18		TLM1	CO1	T1,T2,R1	
11.	Constraint satisfaction	1	08-12-18		TLM1	CO1	T1,T2,R1	

12.	Means Ends Analysis.	1	12-12-18		TLM1	CO1	T1,T2,R1	
13.	Overview/Revision of UNIT-1	1	13-12-18		TLM1	CO1	T1,T2,R1	
14.	Tutorial – I	1	14-12-18		TLM 3			
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT –II: Knowledge Representation

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15.	Introduction to Knowledge Representation	1	15-12-18		TLM 1,2	CO2	T1,T2,R1	
16.	Approaches and issues in knowledge representation	1	19-12-18		TLM1	CO2	T1,T2,R1	
17.	Knowledge - Based Agent	1	20-12-18		TLM1	CO2	T1,T2,R1	
18.	Propositional Logic	1	21-12-18		TLM1	CO2	T1,T2,R1	
19.	Predicate logic	1	22-12-18		TLM 1,2	CO2	T1,T2,R1	
20.	Unification	1	26-12-18		TLM1	CO2	T1,T2,R1	
21.	Resolution	1	27-12-18		TLM1	CO2	T1,T2,R1	
22.	Weak slot – filler structure	1	28-12-18		TLM 1,2	CO2	T1,T2,R1	
23.	Weak slot – filler structure	1	29-12-18		TLM 1,2	CO2	T1,T2,R1	
24.	Strong slot - filler structure.	1	02-01-19		TLM 1,2	CO2	T1,T2,R1	
25.	Strong slot - filler structure.	1	03-01-19		TLM 1,2	CO2	T1,T2,R1	
26.	Overview/Revision of UNIT-2	1	04-01-19		TLM1	CO2	T1,T2,R1	
27.	Tutorial – II	1	05-01-19		TLM 3			
No. of classes required to complete UNIT-2		11			No. of classes taken:			

UNIT –III: Reasoning under uncertainty

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Introduction of Reasoning under Uncertainty	1	09-01-19		TLM 1,2	CO3	T1,T2,R1	
29.	Logics of non-monotonic reasoning	1	10-01-19		TLM 1,2	CO3	T1,T2,R1	
30.	Logics of non-monotonic reasoning	1	11-01-19		TLM1	CO3	T1,T2,R1	
31.	Implementation- Basic probability notation	1	12-01-19		TLM1	CO3	T1,T2,R1	
32.	Bayes rule	1	25-01-19		TLM1	CO3	T1,T2,R1	
33.	Certainty factors and rule based systems	1	30-01-19		TLM1	CO3	T1,T2,R1	
34.	Certainty factors and rule based systems	1	31-01-19		TLM1	CO3	T1,T2,R1	
35.	Bayesian networks	1	01-02-19		TLM1	CO3	T1,T2,R1	
36.	Dempster Shafer Theory	1	02-02-19		TLM1	CO3	T1,T2,R1	
37.	Fuzzy Logic	1	06-02-19		TLM1	CO3	T1,T2,R1	

38.	Overview/Revision of UNIT-3	1	07-02-19		TLM1	CO3	T1,T2,R1	
39.	Tutorial – III	1	08-02-19		TLM 3			
No. of classes required to complete UNIT-3		11			No. of classes taken:			

UNIT –IV: Planning and Learning

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
40.	Planning with state space search	1	13-02-19		TLM 1,2	CO4	T1,T2,R1	
41.	conditional planning-	1	14-02-19		TLM1	CO4	T1,T2,R1	
42.	continuous planning	1	15-02-19		TLM1	CO4	T1,T2,R1	
43.	Multi-Agent planning	1	16-02-19		TLM1	CO4	T1,T2,R1	
44.	Forms of learning	1	20-02-19		TLM1	CO4	T1,T2,R1	
45.	inductive learning	1	21-02-19		TLM1	CO4	T1,T2,R1	
46.	Reinforcement Learning	1	22-02-19		TLM 1,2	CO4	T1,T2,R1	
47.	learning decision trees	1	23-02-19		TLM1,2	CO4	T1,T2,R1	
48.	Neural Net learning and Genetic learning	1	27-02-19		TLM1,2	CO4	T1,T2,R1	
49.	Neural Net learning and Genetic learning	1	28-02-19		TLM1,2	CO4	T1,T2,R1	
50.	Overview/Revision of UNIT-4	1	01-03-19		TLM1	CO4	T1,T2,R1	
51.	Tutorial – IV	1	02-03-19		TLM 3			
No. of classes required to complete UNIT-4		12			No. of classes taken:			

UNIT-V: Advanced Topics:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
52.	Game Playing: Minimax search procedure	1	06-03-19		TLM1	CO5	T1,T2,R1	
53.	Adding alpha-beta cutoffs.	1	07-03-19		TLM1	CO5	T1,T2,R1	
54.	Expert System: Representation	1	08-03-19		TLM1	CO5	T1,T2,R1	
55.	Expert System shells - Knowledge Acquisition	1	13-03-19		TLM1	CO5	T1,T2,R1	
56.	Robotics: Hardware	1	14-03-19		TLM1	CO5	T1,T2,R1	
57.	Robotic Perception – Planning - Application domains.	1	15-03-19		TLM1	CO5	T1,T2,R1	
58.	Swarm Intelligent Systems – Ant Colony System	1	16-03-19		TLM1,2	CO5	T1,T2,R1	
59.	Development of Ant Colony System	1	20-03-19		TLM1	CO5	T1,T2,R1	
60.	Application and Working of Ant Colony System.	1	21-03-19		TLM1,2	CO5	T1,T2,R1	
61.	Overview/Revision of UNIT-5	1	22-03-19		TLM1	CO5	T1,T2,R1	
62.	Tutorial – V	1	23-03-19		TLM3			
No. of classes required to complete UNIT-5		11			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
63.	How AI and NN were related	1	27-03-19		TLM1	CO1-CO5	T1,T2,R1	
64.	How AI and NN were related	1	28-03-19		TLM1	CO1-CO5	T1,T2,R1	

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\%$ of Max(B1,B2)+25% of Min(B1,B2)	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

- Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the **engineering and management principles and apply these to one's own work, as a member and leader** in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PSOs

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyze, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Dr.K.Venkateswara Rao	Dr.K.V.R	Dr.P.M.Ashok	Dr.CH.V.Narayana
Course Instructor	Course Coordinator	Module Coordinator	HOD

COURSE HANDOUT

PROGRAM : B.Tech., VI-Sem., CSE-A
ACADEMIC YEAR : 2018-19
COURSE NAME & CODE : ARTIFICIAL INTELLIGENCE-S137
L-T-P STRUCTURE : 3-1-2
COURSE CREDITS : 3
COURSE INSTRUCTOR : M.Sri Bala
COURSE COORDINATOR : Dr.P.M.Ashok

PRE-REQUISITE: Knowledge of algorithms, neural networks.

COURSE OBJECTIVE:

This course enables the students to know about

- ✓ This gives a clear view of analyzing AI problems, types of problems, Techniques of solving problems.
- ✓ It gives a clear view of knowledge, representation of knowledge, types of logic and its algorithms.
- ✓ This course is used to provide the description of agents and various types of agents and how they used to solve various AI problems.
- ✓ It provides a better understanding of uncertainty and certainty, its factors various theories of uncertainty and appropriate examples.
- ✓ It provides a clear view of state space in search, game playing procedures, expert systems and advanced concepts like swarm intelligent systems.

COURSE OUTCOMES (CO)

CO1	Analyze the design specifications for the structure of agents and distinguish among heuristic techniques.
CO2	Identify approaches and issues in knowledge representation and formulate propositional and predicate logic.
CO3	Formulate the logic of non-monotonic reasoning and apply the techniques in uncertainty domain.
CO4	Analyze the planning and learning techniques in state space search.
CO5	Formulate the design specification of game playing techniques, analyze expert systems, robotics and swarm intelligence systems.

COURSE ARTICULATION MATRIX(Correlation between COs&POs,PSOs):

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	-	-	-	-	-	-	-	-	1	2	-	-
CO2	3	2	1	-	-	-	-	-	-	-	-	1	1	-	-
CO3	1	3	2	1	-	-	-	-	-	-	-	1	1	-	-
CO4	2	3	2	1	-	-	-	-	-	-	-	1	1	-	-
CO5	2	3	2	-	-	-	-	-	-	-	-	1	1	-	-

Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put '-'
1- Slight (Low), **2** - Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

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COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT –I: Introduction of Artificial Intelligence

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction of AI	1	20-11-18		TLM1,2	CO1	T1,T2,R1	
2.	History of AI	1	21-11-18		TLM1	CO1	T1,T2,R1	
3.	History of AI	1	22-11-18		TLM1	CO1	T1,T2,R1	
4.	Intelligent agents	1	23-11-18		TLM 1,2	CO1	T1,T2,R1	
5.	Structure of agents and its functions	1	27-11-18		TLM 1,2	CO1	T1,T2,R1	
6.	Problem spaces and search	1	28-11-18		TLM 1,2	CO1	T1,T2,R1	
7.	Problem spaces and search	1	29-11-18		TLM 1,2	CO1	T1,T2,R1	
8.	Heuristic Search Techniques	1	30-12-18		TLM1	CO1	T1,T2,R1	
9.	Best-first search	1	04-12-18		TLM1	CO1	T1,T2,R1	
10.	Problem reduction	1	05-12-18		TLM1	CO1	T1,T2,R1	
11.	Constraint satisfaction	1	06-12-18		TLM1	CO1	T1,T2,R1	

12.	Means Ends Analysis.	1	07-12-18		TLM1	CO1	T1,T2,R1	
13.	Overview/Revision of UNIT-1	1	11-12-18		TLM1	CO1	T1,T2,R1	
14.	Tutorial – I	1	12-12-18		TLM 3			
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT –II: Knowledge Representation

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15.	Introduction to Knowledge Representation	1	13-12-18		TLM1,2	CO2	T1,T2,R1	
16.	Approaches and issues in knowledge representation	1	14-12-18		TLM1	CO2	T1,T2,R1	
17.	Knowledge - Based Agent	1	18-12-18		TLM1	CO2	T1,T2,R1	
18.	Propositional Logic	1	19-12-18		TLM1	CO2	T1,T2,R1	
19.	Predicate logic	1	20-12-18		TLM 1,2	CO2	T1,T2,R1	
20.	Unification	1	21-12-18		TLM1	CO2	T1,T2,R1	
21.	Resolution	1	25-12-18		TLM1	CO2	T1,T2,R1	
22.	Weak slot – filler structure	1	26-12-18		TLM 1,2	CO2	T1,T2,R1	
23.	Weak slot – filler structure	1	27-12-18		TLM 1,2	CO2	T1,T2,R1	
24.	Strong slot - filler structure.	1	28-12-18		TLM 1,2	CO2	T1,T2,R1	
25.	Strong slot - filler structure.	1	01-01-19		TLM 1,2	CO2	T1,T2,R1	
26.	Overview/Revision of UNIT-2	1	02-01-19		TLM1	CO2	T1,T2,R1	
27.	Tutorial – II	1	03-01-19		TLM 3			
No. of classes required to complete UNIT-2		11			No. of classes taken:			

UNIT –III: Reasoning under uncertainty

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Introduction of Reasoning under Uncertainty	1	04-01-19		TLM 1,2	CO3	T1,T2,R1	
29.	Logics of non-monotonic reasoning	1	08-01-19		TLM 1,2	CO3	T1,T2,R1	
30.	Logics of non-monotonic reasoning	1	09-01-19		TLM1	CO3	T1,T2,R1	
31.	Implementation- Basic probability notation	1	10-01-19		TLM1	CO3	T1,T2,R1	
32.	Bayes rule	1	11-01-19		TLM1	CO3	T1,T2,R1	
33.	Certainty factors and rule based systems	1	24-01-19		TLM1	CO3	T1,T2,R1	
34.	Certainty factors and rule based systems	1	25-01-19		TLM1	CO3	T1,T2,R1	
35.	Bayesian networks	1	30-01-19		TLM1	CO3	T1,T2,R1	
36.	Dempster Shafer Theory	1	31-02-19		TLM1	CO3	T1,T2,R1	
37.	Fuzzy Logic	1	05-02-19		TLM1	CO3	T1,T2,R1	

38.	Overview/Revision of UNIT-3	1	06-02-19		TLM1	CO3	T1,T2,R1	
39.	Tutorial – III	1	07-02-19		TLM3			
No. of classes required to complete UNIT-3		11			No. of classes taken:			

UNIT –IV: Planning and Learning

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
40.	Planning with state space search	1	08-02-19		TLM 1,2	CO4	T1,T2,R1	
41.	conditional planning-	1	12-02-19		TLM1	CO4	T1,T2,R1	
42.	continuous planning	1	13-02-19		TLM1	CO4	T1,T2,R1	
43.	Multi-Agent planning	1	14-02-19		TLM1	CO4	T1,T2,R1	
44.	Forms of learning	1	15-02-19		TLM1	CO4	T1,T2,R1	
45.	inductive learning	1	19-02-19		TLM1	CO4	T1,T2,R1	
46.	Reinforcement Learning	1	20-02-19		TLM 1,2	CO4	T1,T2,R1	
47.	learning decision trees	1	21-02-19		TLM1	CO4	T1,T2,R1	
48.	Neural Net learning and Genetic learning	1	22-02-19		TLM1	CO4	T1,T2,R1	
49.	Neural Net learning and Genetic learning	1	26-02-19		TLM1	CO4	T1,T2,R1	
50.	Overview/Revision of UNIT-4	1	27-02-19		TLM1	CO4	T1,T2,R1	
51.	Tutorial – IV	1	28-03-19		TLM3			
No. of classes required to complete UNIT-4		12			No. of classes taken:			

UNIT-V: Advanced Topics:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
52.	Game Playing: Minimax search procedure	1	01-03-19		TLM1	CO5	T1,T2,R1	
53.	Adding alpha-beta cutoffs.	1	05-03-19		TLM1	CO5	T1,T2,R1	
54.	Expert System: Representation	1	06-03-19		TLM1	CO5	T1,T2,R1	
55.	Expert System shells - Knowledge Acquisition	1	07-03-19		TLM1	CO5	T1,T2,R1	
56.	Robotics: Hardware	1	08-03-19		TLM1	CO5	T1,T2,R1	
57.	Robotic Perception – Planning - Application domains.	1	14-03-19		TLM1	CO5	T1,T2,R1	
58.	Swarm Intelligent Systems – Ant Colony System	1	15-03-19		TLM1	CO5	T1,T2,R1	
59.	Development of Ant Colony System	1	19-03-19		TLM1	CO5	T1,T2,R1	
60.	Application and Working of Ant Colony System.	1	20-03-19		TLM1	CO5	T1,T2,R1	
61.	Overview/Revision of UNIT-5	1	21-03-19		TLM1	CO5	T1,T2,R1	
62.	Tutorial – V	1	22-03-19		TLM3			
No. of classes required to complete UNIT-5		11			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
63.	How AI and NN were related	1	26-03-19		TLM1	CO1-CO5	T1,T2,R1	
64.	How AI and NN were related	1	27-03-19		TLM1	CO1-CO5	T1,T2,R1	
65.	Other concepts related to AI	1	28-03-19		TLM1	CO1-CO5	T1,T2,R1	

Teaching Learning Methods					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\% \text{ of Max}(B1,B2)+25\% \text{ of Min}(B1,B2)$	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of

complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the **engineering and management principles and apply these to one's own work, as a member and leader** in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PSOs

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyse, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Dr.K.Venkateswara Rao	Dr.P.M.Ashok		
Course Instructor	Course Coordinator	Module Coordinator	HOD



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with " A " Grade ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech, VI-Sem., CSE
ACADEMIC YEAR : 2018-19
COURSE NAME & CODE : Compiler Design & S163
L-T-P STRUCTURE : 3-1-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : A.Sudhakar
COURSE COORDINATOR : Dr. D. Veeraiah
PRE-REQUISITE : Knowledge in Theory of Computation

COURSE OBJECTIVE:

- ✓ To introduce the major concept areas of language translation & compiler design and enrich the knowledge in various phases of compiler and its use, code optimization techniques, machine code generation, and use of symbol table. To provide practical programming skills necessary for constructing a compiler.

COURSE OUTCOMES (CO): After completion of this course, a student can able to

- CO1: Illustrate the phases of compiler and functionalities of lexical analyser.
CO2: Apply context-free grammar and PDA design concepts to design Top down parsers.
CO3: Design and implement Bottom-Up parser using LR Parsers.
CO4: Create frameworks for syntax directed translation schemes, type checking and Intermediate code generation.
CO5: Analyse various code optimization techniques and understand the concepts of code generation.

COURSE ARTICULATION MATRIX (Correlation between COs, POs, & PSOs):

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	3	-	2	-	-	-	-	-	-	1	2	-	-
CO2	3	3	3	-	-	-	-	-	-	-	-	1	1	-	-
CO3	3	2	3	-	2	-	-	-	-	-	-	1	2	-	-
CO4	3	3	3	-	-	-	-	-	-	-	-	1	2	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	1	1	-	-

Note: Enter Correlation Levels 1 or 2 or 3.

1- Slight (Low), 2 - Moderate (Medium), 3 - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1 Alfred V.Aho, Jeffrey D.Ullman, Ravi sethi “Compilers Principles, Techniques and Tools”, Pearson Education, 2nd Edition, 2008.

BOS APPROVED REFERENCE BOOKS:

R1 ParagH.Dave, HimanshuB.Dave “CompilersPrinciples and Practice” Person Education, First Edition, 2012.

R2 Andrew W.appel “Modern compiler implementation in C” Cambridge, Revised Edition, 2010.

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

UNIT-I: OVERVIEW OF COMPILATION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Subject	1	19/11/18		TLM1	-	T1	
2.	Course Outcomes	1	20/11/18		TLM1	CO1	-	
3.	Phases of Compilation	1	22/11/18		TLM1	CO1	T1	
4.	Introduction to Lexical Analysis	1	24/11/18		TLM1	CO1	T1	
5.	Lexical Analysis – input buffering	1	26/11/18		TLM1	CO1	T1,R1	
6.	Lexical Analysis – Finite Automata	1	27/11/18		TLM1,TLM4	CO1	T1,R1	
7.	Lexical Analysis – Finite Automata	1	29/11/18		TLM1,TLM4	CO1	T1,R1	
8.	Lexical Analysis – Regular expressions	1	01/12/18		TLM1,TLM4	CO1	T1	
9.	Pass & Phase, Interpretation, Bootstrapping	1	03/12/18		TLM1	CO1	T1	
10.	Data Structures in Compilation	1	04/12/18		TLM1	CO1	T1	
11.	LEX	1	06/12/18		TLM1	CO1	T1,R1	
12.	TUTORIAL-1	1	08/12/18		TLM3	CO1	-	
13.	Assignment/Quiz-1	1	10/12/18		TLM6	CO1	-	
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT-II: Context Free Grammars & Top down Parsing

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	Context Free Grammars	1	11/12/18		TLM1	CO2	T1	
15.	Derivation & Parse Trees	1	13/12/18		TLM1,TLM4	CO2	T1	
16.	Ambiguity, Elimination of Ambiguity	1	15/12/18		TLM1,TLM4	CO2	T1	
17.	Top down Parsing	1	17/12/18		TLM1,TLM4	CO2	T1,R1	
18.	Back Tracking	1	18/12/18		TLM1,TLM4	CO2	T1	
19.	Recursive Descent Parsing	1	20/12/18		TLM1,TLM4	CO2	T1,R1	
20.	Pre-processing Steps required for PP	1	22/12/18		TLM1	CO2	T1	
21.	First & Follow	1	24/12/18		TLM1,TLM4	CO2	T1,R1,R2	
22.	Predictive Parsing	1	27/12/18		TLM1,TLM4	CO2	T1,R2	
23.	LL(1)	1	29/12/18		TLM1,TLM4	CO2	T1,R2	
24.	TUTORIAL-2	1	31/12/18		TLM3	CO2	-	
25.	Assignment/Quiz-3	1	01/01/19		TLM6	CO2	-	
No. of classes required to complete UNIT-II		12			No. of classes taken:			

UNIT-III: Bottom up Parsing

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
26.	Introduction	1	03/01/19		TLM1	CO3	T1	
27.	Shift Reduce Parsing	1	05/01/19		TLM1,TLM4	CO3	T1	
28.	LR parsing	1	07/01/19		TLM1,TLM4	CO3	T1,R1	
29.	SLR	1	08/01/19		TLM1,TLM4	CO3	T1,R1	
30.	CLR	2	10/01/19 & 12/01/19		TLM1,TLM4	CO3	T1,R1	
31.	LALR	1	28/01/19		TLM1,TLM4	CO3	T1,R1	
32.	Error recovery in parsing	1	29/01/19		TLM1,TLM4	CO3	T1,R1	
33.	Handling Ambiguous grammar	1	31/01/19		TLM1,TLM4	CO3	T1	
34.	YACC	1	02/02/19		TLM1,TLM4	CO3	T1,R1	
35.	TUTORIAL-3	1	04/02/19		TLM3	CO3	-	
36.	Assignment/Quiz-3	1	05/02/19		TLM6	CO3	-	
No. of classes required to complete UNIT-III		12			No. of classes taken:			

UNIT-IV: Semantic Analysis & Run time Storage

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
37.	Syntax directed Translation	1	07/02/19		TLM1,TLM2	CO4	T1	
38.	S-attributed and L-attributed grammars	1	09/02/19		TLM1,TLM2	CO4	T1,R1	
39.	Type checker	1	11/02/19		TLM1	CO4	T1	
40.	Intermediate code – abstract syntax tree, polish notation, Three address codes	1	12/02/19		TLM1,TLM2	CO4	T1,R1	
41.	Three address codes	1	14/02/19		TLM1,TLM2	CO4	T1,R1	
42.	Translation of simple statements and control flow statements	1	16/02/19		TLM1,TLM2	CO4	T1	
43.	Run time storage: Storage Organization	1	18/02/19		TLM2	CO4	T1	
44.	Storage allocation strategies	1	19/02/19		TLM2	CO4	T1	
45.	Scope access to local names, parameters	1	21/02/19		TLM2	CO4	T1	
46.	Language facilities for dynamics storage allocation	1	23/02/19		TLM2	CO4	T1	
47.	Tutorial-4	1	25/02/19		TLM3	CO4	-	
48.	Assignment/Quiz-4	1	26/02/19		TLM6	CO4	-	
No. of classes required to complete UNIT-IV		12			No. of classes taken:			

UNIT-V: Code Optimization & Code Generation

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
49.	Code Optimization: Introduction	1	28/03/19		TLM1	CO5	T1	
50.	Principle sources of optimization	1	05/03/19		TLM1	CO5	T1,R1	
51.	Scope, Local & Loop optimization	1	07/03/19		TLM1	CO5	T1,R1	

52.	DAG representation of basic block	1	09/03/19		TLM1,TLM2	CO5	T1,R2	
53.	Code generation: Introduction	1	11/03/19		TLM1	CO5	T1	
54.	Object code forms	1	12/03/19		TLM1	CO5	T1	
55.	Generic code generation algorithm	1	14/03/19		TLM1	CO5	T1	
56.	Register allocation & assignment	2	16/03/19 18/03/19		TLM1,TLM2	CO5	T1	
57.	Peephole optimization	2	19/03/19 21/03/19		TLM1,TLM2	CO5	T1	
58.	TUTORIAL-5	1	23/03/19		TLM3	CO5	-	
59.	Assignment/Quiz-5	1	25/03/19		TLM6	CO5	-	
No. of classes required to complete UNIT-V		13			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
60.	Static Single Assignment	1	26/03/19		TLM1,TLM2		T1	
61.	Use Of Compiler In Computer Architecture	2	28/03/19 30/03/19		TLM1,TLM2		T1	

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\%$ of $\text{Max}(B1,B2)+25\%$ of $\text{Min}(B1,B2)$	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the **engineering and management principles and apply these to one's own work, as a member and leader in a team**, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PSOs

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyze, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

A.Sudhakar	Dr.D.Veeraiah	Dr. Ch. V. Narayana	Dr. Ch. V. Narayana
Course Instructor	Course Coordinator	Module Coordinator	HOD



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with " A " Grade ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada

L.B.REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PROGRAM	: B.Tech, VI-Sem., CSE
ACADEMIC YEAR	: 2018-19
COURSE NAME & CODE	: Compiler Design & S163
L-T-P STRUCTURE	: 3-1-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: Dr. D. Veeraiah
COURSE COORDINATOR	: Dr. D. Veeraiah
PRE-REQUISITE	: Knowledge in Theory of Computation

COURSE OBJECTIVE:

- ✓ To introduce the major concept areas of language translation & compiler design and enrich the knowledge in various phases of compiler and its use, code optimization techniques, machine code generation, and use of symbol table. To provide practical programming skills necessary for constructing a compiler.

COURSE OUTCOMES (CO): After completion of this course, a student can able to

- CO1: Illustrate the phases of compiler and functionalities of lexical analyser.
- CO2: Apply context-free grammar and PDA design concepts to design Top down parsers.
- CO3: Design and implement Bottom-Up parser using LR Parsers.
- CO4: Create frameworks for syntax directed translation schemes, type checking and Intermediate code generation.
- CO5: Analyse various code optimization techniques and understand the concepts of code generation.

COURSE ARTICULATION MATRIX (Correlation between COs, POs, & PSOs):

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	3	-	2	-	-	-	-	-	-	1	2	-	-
CO2	3	3	3	-	-	-	-	-	-	-	-	1	1	-	-
CO3	3	2	3	-	2	-	-	-	-	-	-	1	2	-	-
CO4	3	3	3	-	-	-	-	-	-	-	-	1	2	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	1	1	-	-

Note: Enter Correlation Levels 1 or 2 or 3.

1- Slight (Low), 2 - Moderate (Medium), 3 - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1 Alfred V.Aho, Jeffrey D.Ullman, Ravi sethi “Compilers Principles, Techniques and Tools”, Pearson Education, 2nd Edition, 2008.

BOS APPROVED REFERENCE BOOKS:

R1 Parag H.Dave, HimanshuB.Dave “Compilers Principles and Practice” Person Education, First Edition, 2012.

R2 Andrew W.appel “Modern compiler implementation in C” Cambridge, Revised Edition, 2010.

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

UNIT-I: OVERVIEW OF COMPILEATION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Subject	1	19/11/18		TLM1	-	T1	
2.	Course Outcomes	1	21/11/18		TLM1	CO1	-	
3.	Phases of Compilation	1	22/11/18		TLM1	CO1	T1	
4.	Introduction to Lexical Analysis	1	23/11/18		TLM1	CO1	T1	
5.	Lexical Analysis – input buffering	1	26/11/18		TLM1	CO1	T1,R1	
6.	Lexical Analysis – Finite Automata	1	28/11/18		TLM1,TLM4	CO1	T1,R1	
7.	Lexical Analysis – Finite Automata	1	29/11/18		TLM1,TLM4	CO1	T1,R1	
8.	Lexical Analysis – Regular expressions	1	03/12/18		TLM1,TLM4	CO1	T1	
9.	Pass & Phase, Interpretation, Bootstrapping	1	05/12/18		TLM1	CO1	T1	
10.	Data Structures in Compilation	1	06/12/18		TLM1	CO1	T1	
11.	LEX	1	07/12/18		TLM1	CO1	T1,R1	
12.	TUTORIAL-1	1	10/12/18		TLM3	CO1	-	
13.	Assignment/Quiz-1	1	12/12/18		TLM6	CO1	-	
No. of classes required to complete UNIT-I		13			No. of classes taken:			

UNIT-II: Context Free Grammars & Top down Parsing

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	Context Free Grammars	1	13/12/18		TLM1	CO2	T1	
15.	Derivation & Parse Trees	1	14/12/18		TLM1,TLM4	CO2	T1	
16.	Ambiguity, Elimination of Ambiguity	1	17/12/18		TLM1,TLM4	CO2	T1	
17.	Top down Parsing	1	19/12/18		TLM1,TLM4	CO2	T1,R1	
18.	Back Tracking	1	20/12/18		TLM1,TLM4	CO2	T1	
19.	Recursive Descent Parsing	1	21/12/18		TLM1,TLM4	CO2	T1,R1	
20.	Pre-processing Steps required for PP	1	24/12/18		TLM1	CO2	T1	
21.	First & Follow	1	26/12/18		TLM1,TLM4	CO2	T1,R1,R2	
22.	Predictive Parsing	1	27/12/18		TLM1,TLM4	CO2	T1,R2	
23.	LL(1)	1	28/12/18		TLM1,TLM4	CO2	T1,R2	
24.	TUTORIAL-2	1	31/12/18		TLM3	CO2	-	
25.	Assignment/Quiz-3	1	02/01/19		TLM6	CO2	-	
No. of classes required to complete UNIT-II		12			No. of classes taken:			

UNIT-III: Bottom up Parsing

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
26.	Introduction	1	03/01/19		TLM1	CO3	T1	
27.	Shift Reduce Parsing	1	04/01/19		TLM1,TLM4	CO3	T1	
28.	LR parsing	1	07/01/19		TLM1,TLM4	CO3	T1,R1	
29.	SLR	2	09/01/11& 10/01/19		TLM1,TLM4	CO3	T1,R1	
30.	CLR	2	11/01/19 & 28/01/19		TLM1,TLM4	CO3	T1,R1	
31.	LALR	1	30/01/19		TLM1,TLM4	CO3	T1,R1	
32.	Error recovery in parsing	1	31/01/19		TLM1,TLM4	CO3	T1,R1	
33.	Handling Ambiguous grammar	1	01/02/19		TLM1,TLM4	CO3	T1	
34.	YACC	1	04/02/19		TLM1,TLM4	CO3	T1,R1	
35.	TUTORIAL-3	1	06/02/19		TLM3	CO3	-	
36.	Assignment/Quiz-3	1	07/02/19		TLM6	CO3	-	
No. of classes required to complete UNIT-III		13			No. of classes taken:			

UNIT-IV: Semantic Analysis & Run time Storage

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
37.	Syntax directed Translation	1	08/02/19		TLM1,TLM2	CO4	T1	
38.	S-attributed and L-attributed grammars	1	11/02/19		TLM1,TLM2	CO4	T1,R1	
39.	Type checker	1	13/02/19		TLM1	CO4	T1	
40.	Intermediate code – abstract syntax tree, polish notation, Three address codes	1	14/02/19		TLM1,TLM2	CO4	T1,R1	
41.	Three address codes	1	15/02/19		TLM1,TLM2	CO4	T1,R1	
42.	Translation of simple statements and control flow statements	1	18/02/19		TLM1,TLM2	CO4	T1	
43.	Run time storage: Storage Organization	1	20/02/19		TLM2	CO4	T1	
44.	Storage allocation strategies	1	21/02/19		TLM2	CO4	T1	
45.	Scope access to local names, parameters	1	22/02/19		TLM2	CO4	T1	
46.	Language facilities for dynamics storage allocation	1	25/02/19		TLM2	CO4	T1	
47.	Tutorial-4	1	27/02/19		TLM3	CO4	-	
48.	Assignment/Quiz-4	1	28/02/19		TLM6	CO4	-	
No. of classes required to complete UNIT-IV		12			No. of classes taken:			

UNIT-V: Code Optimization & Code Generation

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
49.	Code Optimization: Introduction	1	06/03/19		TLM1	CO5	T1	
50.	Principle sources of optimization	1	07/03/19		TLM1	CO5	T1,R1	
51.	Scope, Local & Loop optimization	1	08/03/19		TLM1	CO5	T1,R1	

52.	DAG representation of basic block	1	11/03/19		TLM1,TLM2	CO5	T1,R2	
53.	Code generation: Introduction	1	13/03/19		TLM1	CO5	T1	
54.	Object code forms	1	15/03/19		TLM1	CO5	T1	
55.	Generic code generation algorithm	1	18/03/19		TLM1	CO5	T1	
56.	Register allocation & assignment	1	20/03/19		TLM1,TLM2	CO5	T1	
57.	Peephole optimization	1	21/03/19		TLM1,TLM2	CO5	T1	
58.	TUTORIAL-5	1	22/03/19		TLM3	CO5	-	
59.	Assignment/Quiz-5	1	25/03/19		TLM6	CO5	-	
No. of classes required to complete UNIT-V		11			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
60.	Static Single Assignment	1	27/03/19		TLM1,TLM2		T1	
61.	Use Of Compiler In Computer Architecture	2	28/03/19 & 29/03/19		TLM1,TLM2		T1	

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\% \text{ of Max}(B1,B2)+25\% \text{ of Min}(B1,B2)$	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
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PSOs

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyze, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Dr.D.Veeraiah	Dr.D.Veeraiah	Dr. Ch. V. Narayana	Dr. Ch. V. Narayana
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
(Autonomous & Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,
NAAC Accredited with 'A' grade, Accredited by NBA, Certified by ISO 9001:2015)
L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

Part-A

PROGRAM : B.Tech., VI-SEM,CSE(SEC-A)

ACADEMIC YEAR : 2018-19

COURSE NAME & CODE : Distributed Operating Systems

L-T-P STRUCTURE : 3-1-0

COURSE CREDITS : 3

COURSE INSTRUCTOR : Dr O.Rama Devi

COURSE COORDINATOR : Dr O.Rama Devi

PRE-REQUISITE: Knowledge in operating system concepts.

COURSE EDUCATIONAL OBJECTIVES (CEOs) : This course provides a comprehensive introduction to understand the underlying principles, techniques and approaches which constitute a coherent body of knowledge in operating systems. In particular, the course will consider inherent functionality and processing of program execution. The emphasis of the course will be placed on understanding how the various elements that underlie operating system interact and provides services for execution of application software.

COURSE OUTCOMES (COs)

After completion of the course, the student will be able to

CO1: Identify the hardware and software concepts to design the communication model in Distributed System.

CO2: Evaluate the implementation of process, thread, file systems and processors in Distributed system.

CO3: Analyze Clock Synchronization protocols in Distributed system as well as Deadlock handling mechanism.

CO4: Compare Shared memory Multiprocessors used in Distributed System.

CO5: Examine the case study of CHROUS, MACH distributed operating systems.

COURSE ARTICULATION MATRIX (Correlation between COs&POs,PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			2												1
CO2		1	2												
CO3			2												
CO4				2										1	
CO5	1	1	2												

Note: Enter Correlation Levels 1 or 2 or 3. If there is no correlation, put '-'

1- Slight (Low), 2 – Moderate (Medium), 3 - Substantial (High).

BOS APPROVED TEXT BOOKS:

1.Andrew S Tenanbum Distributed Operating Systems Pearson Education ,1995.

BOS APPROVED REFERENCE BOOKS:

Pradeep K Sinha -Distributed Operating System: Concepts and Design –Wiley Publications, 1996

Part-B**COURSE DELIVERY PLAN (LESSON PLAN): Section-A/B/C****UNIT-I : Introduction to Distributed Systems & Communication in Distributed Systems**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Subject	1	20-11-17		1,2,3	CO1	1	
2.	Distributed systems Introduction	1	22-11-17		1,2,3	CO1	1	
3.	Its goals	1	23-11-17		1,2,3	CO1	1	
4.	Hardware concepts	1	24-11-17		1,2,3	CO1	1	
5.	Software concepts	1	27-11-17		1,2,3	CO1	1	
6.	Design issues	1	29-11-17		1,2,3	CO1	1	
7.	Design issues	1	30-11-17		1,2,3	CO1	1	
8.	Tutorial-1	1	01-12-17		1,2,3	CO1	1	
9.	Layered protocols	1	04-12-17		1,2,3	CO1	1	
10.	ATM Networks	1	06-12-17		1,2,3	CO1	1	
11.	Client Server model	1	07-12-17		1,2,3	CO1	1	
12.	RPC	1	11-12-17		1,2,3	CO1	1	
13.	Group communication	1	13-12-17		1,2,3	CO1	1	
14.	Tutorial-2	1	14-12-17		1,2,3	CO1	1	
No. of classes required to complete UNIT-I		14	No. of classes taken:					

UNIT-II : Process and Processors & Distributed File Systems

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15.	Threads, system models	1	15-12-17		1,2,3	CO2	1	
16.	processor allocation	1	18-12-17		1,2,3	CO2	1	
17.	Scheduling	1	20-12-17		1,2,3	CO2	1	
18.	Fault Tolerance	1	21-12-18		1,2,3	CO2	1	
19.	Real Time Distributed Systems.	1	22-12-18		1,2,3	CO2	1	
20.	Tutorial-3	1	25-12-18		1,2,3	CO2	1	
21.	File system	1	27-12-18		1,2,3	CO2	1	

	design							
22.	File system implementation	1	28-12-18		1,2,3	CO2	1	
23.	Trends in Distributed File	1	29-12-18		1,2,3	CO2	1	
24.	Systems	1	01-01-19		1,2,3	CO2	1	
25.	Tutorial-4	1	03-01-19		1,2,3	CO2	1	
No. of classes required to complete UNIT-II		11			No. of classes taken:			

UNIT-III: Synchronization in Distributed Systems

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
26	Introduction	1	04-01-19		1,2,3	CO3	1	
27	Clock synchronization	1	05-01-19		1,2,3	CO3	1	
28	Clock synchronization	1	08-01-19		1,2,3	CO3	1	
29	Mutual Exclusion	1	10-01-19		1,2,3	CO3	1	
30	Mutual Exclusion	1	11-01-19		1,2,3	CO3	1	
31	Tutorial-5	1	25-01-19		1,2,3	CO3	1	
32	Election Algorithms	1	26-01-19		1,2,3	CO3	1	
33	Election Algorithms	1	29-01-19		1,2,3	CO3	1	
34	Atomic Transactions	1	31-01-18		1,2,3	CO3	1	
35	Atomic Transactions	1	01-02-18		1,2,3	CO3	1	
36	Deadlocks	1	02-02-18		1,2,3	CO3	1	
37	Tutorial-6	1	05-02-18		1,2,3	CO3	1	
38	Revision	1	07-02-18		1,2,3	CO3	1	
No. of classes required to complete UNIT-III		13			No. of classes taken:			

UNIT-IV : Distributed Shared Memory

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
39.	Introduction to Distributed	1	08-02-18		1,2,3	CO4	1	
40.	Shared Memory	1	12-02-18		1,2,3	CO4	1	
41.	Bus based multiprocessors	1	14-02-18		1,2,3	CO4	1	
42.	Bus based multiprocessors	1	15-02-18		1,2,3	CO4	1	
43.	Tutorial-7	1	21-02-18		1,2,3	CO4	1	

44.	Ring based multiprocessors	1	22-02-18		1,2,3	CO4	1	
45.	Switched multiprocessors	1	28-03-18		1,2,3	CO4	1	
46.	NUMA multiprocessors	1	01-03-18		1,2,3	CO4	1	
47.	Revision	1	05-03-18		1,2,3	CO4	1	
48.	Comparison of Shared Memory	1	07-03-18		1,2,3	CO4	1	
49.	Tutorial-8	1	08-03-18		1,2,3	CO4	1	
No. of classes required to complete UNIT-IV		12			No. of classes taken:			

UNIT-V : Case Studies

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
50.	MACH OS Introduction	1	09-03-18		1,2,3	CO5	1	
51.	Internal topics of MACH OS	1	14-03-18		1,2,3	CO5	1	
52.	Internal topics of MACH OS	1	19-03-18		1,2,3	CO5	1	
53.	Tutorial-9	1	21-03-18		1,2,3	CO5	1	
54.	CHORUS	1	22-03-18		1,2,3	CO5	1	
55.	CHORUS	1	26-03-18		1,2,3	CO5	1	
56.	CHORUS	1	28-03-18		1,2,3	CO5	1	
57.	Tutorial-10	1	29-03-18		1,2,3	CO5	1	
58.	Review	1	30-03-18		1,2,3	CO5	1	
No. of classes required to complete UNIT-V		9			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
59.								
60.								
61.								

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
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TLM2	PPT	TLM5	ICT (NPTEL/Swayam Prabha/MOOCs)
TLM3	Tutorial	TLM6	Group Discussion/Project

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions+CRT Classes	19-11-2018	12-01-2019	7W+1W
I Mid Examinations	18-01-2019	24-01-2019	1W
II Phase of Instructions	25-01-2019	30-03-2019	9W
II Mid Examinations	01-04-2019	06-04-2019	1W
Preparation and Practicals	08-04-2019	20-04-2019	2W
Semester End Examinations	22-04-2019	04-05-2019	2W

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\%$ of Max(B1,B2)+25% of Min(B1,B2)	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

**Course
Instructor**

Course Coordinator

Module Coordinator

HOD

CO 5	1	1	2											
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Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put ‘-’

1- Slight (Low), **2** – Moderate (Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

1.Andrew S Tenanbum Distributed Operating Systems Pearson Education ,1995.

BOS APPROVED REFERENCE BOOKS:

Pradeep K Sinha -Distributed Operating System: Concepts and Design –Wiley Publications, 1996

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A/B/C

UNIT-I : Introduction to Distributed Systems & Communication in Distributed Systems

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Subject	1	20-11-17		1,2,3	CO1	1	
2.	Distributed systems Introduction	1	21-11-17		1,2,3	CO1	1	
3.	Its goals	1	22-11-17		1,2,3	CO1	1	
4.	Hardware concepts	1	23-11-17		1,2,3	CO1	1	
5.	Software concepts	1	27-11-17		1,2,3	CO1	1	
6.	Design issues	1	28-11-17		1,2,3	CO1	1	
7.	Design issues	1	29-11-17		1,2,3	CO1	1	
8.	Tutorial-1	1	30-11-17		1,2,3	CO1	1	
9.	Layered protocols	1	4-12-17		1,2,3	CO1	1	
10.	ATM Networks	1	5-12-17		1,2,3	CO1	1	
11.	Client Server model	1	6-12-17		1,2,3	CO1	1	
12.	RPC	1	7-12-17		1,2,3	CO1	1	
13.	Group communication	1	11-12-17		1,2,3	CO1	1	
14.	Tutorial-2	1	12-12-17		1,2,3	CO1	1	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

UNIT-II : Process and Processors & Distributed File Systems

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
15.	Threads, system	1	18-12-17		1,2,3	CO2	1	

	models							
16.	processor allocation	1	19-12-17		1,2,3	CO2	1	
17.	Scheduling	1	20-12-17		1,2,3	CO2	1	
18.	Fault Tolerance	1	21-12-18		1,2,3	CO2	1	
19.	Real Time Distributed Systems.	1	26-12-18		1,2,3	CO2	1	
20.	Tutorial-3	1	27-12-18		1,2,3	CO2	1	
21.	File system design	1	28-12-18		1,2,3	CO2	1	
22.	File system implementation	1	02-01-19		1,2,3	CO2	1	
23.	Trends in Distributed File Systems	1	03-01-19		1,2,3	CO2	1	
24.	Tutorial-4	1	04-01-19		1,2,3	CO2	1	
25.	Tutorial-4	1	15-01-19		1,2,3	CO2	1	
No. of classes required to complete UNIT-II		11			No. of classes taken:			

UNIT-III: Synchronization in Distributed Systems

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
26	Introduction	1	16-01-19		1,2,3	CO3	1	
27	Clock synchronization	1	17-01-19		1,2,3	CO3	1	
28	Clock synchronization	1	11-01-19		1,2,3	CO3	1	
29	Mutual Exclusion	1	25-01-19		1,2,3	CO3	1	
30	Mutual Exclusion	1	29-01-19		1,2,3	CO3	1	
31	Tutorial-5	1	30-01-19		1,2,3	CO3	1	
32	Election Algorithms	1	31-01-19		1,2,3	CO3	1	
33	Election Algorithms	1	01-02-19		1,2,3	CO3	1	
34	Atomic Transactions	1	05-02-18		1,2,3	CO3	1	
35	Atomic Transactions	1	06-02-18		1,2,3	CO3	1	
36	Deadlocks	1	07-02-18		1,2,3	CO3	1	
37	Tutorial-6	1	08-02-18		1,2,3	CO3	1	
38	Revision	1	12-02-18		1,2,3	CO3	1	
No. of classes required to complete UNIT-III		13			No. of classes taken:			

UNIT-IV : Distributed Shared Memory

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
39.	Introduction to Distributed	1	13-02-18		1,2,3	CO4	1	
40.	Shared Memory	1	15-02-18		1,2,3	CO4	1	
41.	Bus based multiprocessors	1	20-02-18		1,2,3	CO4	1	
42.	Bus based multiprocessors	1	22-02-18		1,2,3	CO4	1	
43.	Tutorial-7	1	26-02-18		1,2,3	CO4	1	
44.	Ring based multiprocessors	1	28-02-18		1,2,3	CO4	1	
45.	Switched multiprocessors	1	01-03-18		1,2,3	CO4	1	
46.	NUMA multiprocessors	1	05-03-18		1,2,3	CO4	1	
47.	Revision	1	07-03-18		1,2,3	CO4	1	
48.	Comparison of Shared Memory	1	08-03-18		1,2,3	CO4	1	
49.	Tutorial-8	1	12-03-18		1,2,3	CO4	1	
No. of classes required to complete UNIT-IV		12			No. of classes taken:			

UNIT-V : Case Studies

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
50.	MACH OS Introduction	1	15-03-18		1,2,3	CO5	1	
51.	Internal topics of MACH OS	1	20-03-18		1,2,3	CO5	1	
52.	Internal topics of MACH OS	1	21-03-18		1,2,3	CO5	1	
53.	Tutorial-9	1	22-03-18		1,2,3	CO5	1	
54.	CHORUS OS Introduction	1	26-03-18		1,2,3	CO5	1	
55.	Internal topics of CHORUS OS	1	27-03-18		1,2,3	CO5	1	
56.	Internal topics of CHORUS OS	1	28-03-18		1,2,3	CO5	1	

57.	Tutorial-10	1	29-03-18		1,2,3	CO5	1	
58.	Review	1	30-03-18		1,2,3	CO5	1	
No. of classes required to complete UNIT-V		9			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
59.								
60.								
61.								

Teaching Learning Methods			
TLM1	Chalk and Talk	TLM4	Demonstration (Lab/Field Visit)
TLM2	PPT	TLM5	ICT (NPTEL/Swayam Prabha/MOOCs)
TLM3	Tutorial	TLM6	Group Discussion/Project

ACADEMIC CALENDAR

Description	From	To	Weeks
I Phase of Instructions+CRT Classes	19-11-2018	12-01-2019	7W+1W
I Mid Examinations	18-01-2019	24-01-2019	1W
II Phase of Instructions	25-01-2019	30-03-2019	9W
II Mid Examinations	01-04-2019	06-04-2019	1W
Preparation and Practicals	08-04-2019	20-04-2019	2W
Semester End Examinations	22-04-2019	04-05-2019	2W

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5

Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\%$ of Max(B1,B2)+25% of Min(B1,B2)	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

**Course
Instructor**

Course Coordinator

Module Coordinator

HOD

COURSE HANDOUT

PROGRAM : B.Tech., VI-Sem., CSE
ACADEMIC YEAR : 2018-19
COURSE NAME & CODE : Information Security - S272
L-T-P STRUCTURE : 3-1-0
COURSE CREDITS : 3
COURSE INSTRUCTOR: Mr.N V NAIK
COURSE COORDINATOR : Dr. K.S.M.V.KUMAR
PRE-REQUISITE: Knowledge of security issues in using a network

COURSE OBJECTIVE: This course provides the knowledge to understand the basic concept of Cryptography and Network Security, types of ciphers and various symmetric and asymmetric algorithms. Also provides the knowledge on digital signatures, viruses, intruders and firewalls.

COURSE OUTCOMES (COs)

CO1: Illustrate the use of private key encryption algorithms for achieving data confidentiality.

CO2: Apply various message authentication approaches in public key encryption to achieve authentication and data integrity.

CO3: Analyse the Email privacy algorithms and elevate the IP security architectural issues and its headers.

CO4: Understand the web security protocols for achieving secure electronic transactions over the internet.

CO5: Identify the threats and remedial measures for system security and authorization.

COURSE ARTICULATION MATRIX (Correlation between COs&POs,PSOs):

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	3	2	-	-	1	-	-	-	-	-	1	1	-	-
CO2	2	3	2	-	-	1	-	-	-	-	-	1	1	-	-
CO3	2	3	2	-	-	2	-	-	-	-	-	1	1	-	-
CO4	2	1	2	-	-	2	-	-	-	-	-	1	1	-	-
CO5	2	3		-	-		-	-	-	-	-	1		-	-

Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put '-'

1- Slight(Low), 2 - Moderate(Medium), 3 - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1 William Stallings, Network Security Essentials (Applications and Standards), Pearson Education.

BOS APPROVED REFERENCE BOOKS:

R1 Stallings, Cryptography and Network Security, PHI/Pearson, Third edition

R2 Whitman, Principles of Information Security, Thomson

R3 Robert Bragg, Mark Rhodes, Network Security: The complete reference, TMH

R4 Buchmann, Springer Introduction to Cryptography.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT-I

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Network Security	2	19.11.18 & 20.11.18		TLM1	CO1	T1	
2.	Security Attacks	1	24.11.18		TLM1/ TLM2	CO1	T1	
3.	Security Services and Mechanisms Model for Internetwork security	1	26.11.18		TLM1/ TLM2	CO1	T1	
4.	Internet Standards and RFCs Conventional Encryption Principles	1	27.11.18		TLM1/ TLM2	CO1	T1	
5.	Conventional Encryption Algorithms - DES	2	29.11.18 & 30.11.18		TLM1/ TLM2	CO1	T1	
6.	Conventional Encryption Algorithms - Triple DES	1	01.12.18		TLM1/ TLM2	CO1	T1	
7.	ASSIGNMENT / QUIZ -1	1	03.12.18		TLM6	CO1		
8.	Cipher Block Modes of Operations	1	4.12.18		TLM1/ TLM2	CO1	T1	
9.	Location of Encryption Devices	1	06.12.18		TLM1	CO1	T1	
10.	Key Distribution	1	08.12.18		TLM1/ TLM2	CO1	T1	
11.	Approaches of Message Authentication	1	10.12.18		TLM1/ TLM2	CO1	T1	
12.	Secure Hash Functions	1	11.12.18		TLM1/ TLM2	CO1	T1	
13.	SHA – ALGORITHM	1	13.12.18		TLM1/ TLM2	CO1	T1	
14.	HMAC ALGORITHM	1	15.12.18		TLM1/ TLM2	CO1	T1	
15.	TUTORIAL	1	17.12.18		TLM3	CO1		
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II

S.No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	Text Book	HOD Sign
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		Required	Completion	Completion	Methods	COs	followed	Weekly
16.	Public Key Cryptography principles	1	18.12.18		TLM1/ TLM2	CO2	T1	
17.	Public Key Cryptography Algorithms	2	20.12.18		TLM1/ TLM2	CO2	T1	
18.	Digital Signatures Digital Certificates	1	22.12.18		TLM1/ TLM2	CO2	T1	
19.	Certificate Authority	1	24.12.18		TLM1/ TLM2	CO2	T1	
20.	ASSIGNMENT / QUIZ	1	26.12.18		TLM6	CO2	T1	
21.	Key Management	1	27.12.18		TLM1/ TLM2	CO2	T1	
22.	Kerberos	1	28.12.18		TLM1/ TLM2	CO2	T1	
23.	X.509 Directory	2	29.12.18 & 31.12.18		TLM1/ TLM2	CO2	T1	
24.	Authentication Service	1	03.01.19		TLM1/ TLM2	CO2	T1	
25.	TUTORIAL	1	05.01.19		TLM3	CO2	T1	
26.	CRT	-	7/1/19 TO 12/1/19					
27.	I MID EXAMINATION	-	18/1/19 TO 24/1/19					
No. of classes required to complete UNIT-II		12			No. of classes taken:			

UNIT-III

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Pretty Good Privacy (PGP)	1	28.01.19		TLM1/ TLM2	CO3	T1	
29.	PGP - Messages	1	31.01.19		TLM1/ TLM2	CO3	T1	
30.	S/MIME introduction	1	02.02.19		TLM1/ TLM2	CO3	T1	
31.	S/MIME Content Types & Transfer Encodings	1	04.02.19		TLM1/ TLM2	CO3	T1	
32.	S/MIME Functionality & Messages	1	05.02.19		TLM1/ TLM2	CO3	T1	
33.	ASSIGNMENT / QUIZ	1	07.02.19		TLM6	CO3	T1	
34.	IP Security Architecture	1	09.02.19		TLM1/ TLM2	CO3	T1	
35.	Authentication Header	1	11.02.19		TLM1/ TLM2	CO3	T1	
36.	Encapsulating Security Payload	1	12.02.19		TLM1/ TLM2	CO3	T1	
37.	Combining Security Associations	2	14.02.19 & 16.02.19		TLM1/ TLM2	CO3	T1	

38.	TUTORIAL	1	18.2.19		TLM3	CO3	T1	
No. of classes required to complete UNIT-III		12			No. of classes taken:			

UNIT-IV

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
39.	Web Security Requirements	1	19.02.19		TLM1/ TLM2	CO4	T1	
40.	Secure Socket Layer (SSL)	1	21.02.19		TLM1/ TLM2	CO4	T1	
41.	SSL Record Protocol	1	23.02.19		TLM1/ TLM2	CO4	T1	
42.	Change Cipher Spec Protocol Alert Protocol	1	25.02.19		TLM1/ TLM2	CO4	T1	
43.	SSL Handshake Protocol	1	26.02.19		TLM1/ TLM2	CO4	T1	
44.	Transport Layer Security	1	28.02.19		TLM1/ TLM2	CO4	T1	
45.	ASSIGNMENT / QUIZ	1	02.03.19		TLM6	CO4	T1	
46.	SET Requirements & Features	1	05.03.19		TLM1/ TLM2	CO4	T1	
47.	SET Participants & Sequence of events	1	05.03.19		TLM1/ TLM2	CO4	T1	
48.	Construction of Dual Signature & SET Transaction Types	1	07.03.19		TLM1/ TLM2	CO4	T1	
49.	Purchase Request by Cardholder	1	09.03.19		TLM1/ TLM2	CO4	T1	
50.	Customer Purchase Request Verification by Merchant	1	11.03.19		TLM1/ TLM2	CO4	T1	
51.	TUTORIAL	1	12.03.19		TLM3	CO4	T1	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
52.	Intruders	1	14.03.19		TLM1	CO5	T1	
53.	Viruses and Related Threats	1	16.03.19		TLM1/ TLM2	CO5	T1	
54.	Virus Countermeasures	1	19.03.19		TLM1/ TLM2	CO5	T1	
55.	ASSIGNMENT / QUIZ	1	21.03.19		TLM6	CO5	T1	
56.	Firewall Characteristics	1	23.03.19		TLM1	CO5	T1	
57.	Types of Firewalls	1	25.03.19		TLM1/ TLM2	CO5	T1	
58.	Trusted System	1	26.03.19		TLM1/ TLM2	CO5	T1	
59.	Introduction to Database Security and authorization	2	27.03.19 & 28/3/19		TLM1/ TLM2	CO5	T1	
60.	TUTORIAL	1	29.03.19		TLM3	CO5	T1	

61.	REVISION	1	30.03.19		TLM1/ TLM2	CO5	T1	
No. of classes required to complete UNIT-V		11			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
62.	Substitution & Transposition Techniques	1	07.01.19		TLM1	CO1	R1	
63.	Fermat's & Euers Theorem	1	08.01.19 & 10.01.19		TLM1	CO2	R1	
64.	Chinese Remainder Theorem	1	12.01.19		TLM1	CO2	R1	

Teaching Learning Methods					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\% \text{ of Max}(B1,B2)+25\% \text{ of Min}(B1,B2)$	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAM OUTCOMES

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to

comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the **engineering and management principles and apply these to one's own work, as a member and leader** in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyze, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Mr. N V NAIK	Dr.K.S.M.V.KUMAR	Dr.K.S.M.V.KUMAR	Dr.Ch Venkata Narayana
Course Instructor	Course Coordinator	Module Coordinator	HOD

COURSE HANDOUT

PROGRAM : B.Tech., VI-Sem., CSE
ACADEMIC YEAR : 2018-19
COURSE NAME & CODE : Information Security - S272
L-T-P STRUCTURE : 3-1-0
COURSE CREDITS : 3
COURSE INSTRUCTOR: Dr. K. S. M. V. Kumar
COURSE COORDINATOR : Dr. K. S. M. V. Kumar
PRE-REQUISITE: Knowledge of security issues in using a network

COURSE OBJECTIVE : This course provides the knowledge to understand the basic concept of Cryptography and Network Security , types of ciphers and various symmetric and assymmetric algorithms. Also provides the knowledge on digital signatures , viruses , intruders and firewalls.

COURSE OUTCOMES (COs)

CO1: Illustrate the use of private key encryption algorithms for achieving data confidentiality

CO2: Apply various message authentication approaches in public key encryption to achieve authentication and data integrity

CO3: Analyse the Email privacy algorithms and elevate the IP security architectural issues and its headers.

CO4: Understand the web security protocols for achieving secure electronic transactions over the internet .

CO5: Identify the threats and remedial measures for system security and authorization

COURSE ARTICULATION MATRIX (Correlation between COs&POs,PSOs):

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	3	2	-	-	1	-	-	-	-	-	1	2	-	-
CO2	2	3	2	-	-	1	-	-	-	-	-	1	1	-	-
CO3	2	3	2	-	-	2	-	-	-	-	-	1	1	-	-
CO4	2	1	2	-	-	2	-	-	-	-	-	1	1	-	-
CO5	2	3	-	-	-	-	-	-	-	-	-	1	1	-	-

Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, put ‘-’
1- Slight(Low), **2** - Moderate(Medium), **3** - Substantial (High).

BOS APPROVED TEXT BOOKS:

T1 William Stallings, Network Security Essentials (Applications and Standards), Pearson Education.

BOS APPROVED REFERENCE BOOKS:

R1 Stallings, Cryptography and Network Security, PHI/Pearson, Third edition

R2 Whitman, Principles of Information Security, Thomson

R3 Robert Bragg, Mark Rhodes, Network Security: The complete reference, TMH

R4 Buchmann, Springer Introduction to Cryptography.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT-I

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Network Security	1	19.11.18		TLM1	CO1	T1	
2.	Security Attacks	1	20.11.18		TLM1/ TLM2	CO1	T1	
3.	Security Services and Mechanisms Model for Internetwork security	1	21.11.18		TLM1/ TLM2	CO1	T1	
4.	Internet Standards and RFCs Conventional Encryption Principles	1	24.11.18		TLM1/ TLM2	CO1	T1	
5.	Conventional Encryption Algorithms - DES	2	26.11.18		TLM1/ TLM2	CO1	T1	
6.	Conventional Encryption Algorithms - Triple DES	1	27.11.18		TLM1/ TLM2	CO1	T1	
7.	ASSIGNMENT / QUIZ -1	1	28.11.18		TLM6	CO1		
8.	Cipher Block Modes of Operations	2	01.12.18		TLM1/ TLM2	CO1	T1	
9.	Location of Encryption Devices	1	03.12.18		TLM1	CO1	T1	
10.	Key Distribution	1	04.12.18		TLM1/ TLM2	CO1	T1	
11.	Approaches of Message Authentication	1	05.12.18		TLM1/ TLM2	CO1	T1	
12.	Secure Hash Functions	1	08.12.18		TLM1/ TLM2	CO1	T1	
13.	SHA – ALGORITHM	1	10.12.18		TLM1/ TLM2	CO1	T1	
14.	HMAC ALGORITHM	1	11.12.18		TLM1/ TLM2	CO1	T1	
15.	TUTORIAL	1	12.12.18		TLM3	CO1		
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
16.	Public Key Cryptography	1	12.12.18		TLM1/	CO2	T1	

	principles				TLM2			
17.	Public Key Cryptography Algorithms	2	15.12.18		TLM1/ TLM2	CO2	T1	
18.	Digital Signatures Digital Certificates	1	17.12.18		TLM1/ TLM2	CO2	T1	
19.	Certificate Authority	1	18.12.18		TLM1/ TLM2	CO2	T1	
20.	ASSIGNMENT / QUIZ	1	19.12.18		TLM6	CO2	T1	
21.	Key Management	1	22.12.18		TLM1/ TLM2	CO2	T1	
22.	Kerberos	1	24.12.18		TLM1/ TLM2	CO2	T1	
23.	X.509 Directory	2	26.12.18		TLM1/ TLM2	CO2	T1	
24.	Authentication Service	1	29.12.18		TLM1/ TLM2	CO2	T1	
25.	TUTORIAL	1	31.12.18		TLM3	CO2	T1	
No. of classes required to complete UNIT-II		12			No. of classes taken:			

UNIT-III

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
26.	Pretty Good Privacy (PGP)	1	01.01.19		TLM1/ TLM2	CO3	T1	
27.	PGP - Messages	1	02.01.19		TLM1/ TLM2	CO3	T1	
28.	S/MIME introduction	1	05.01.19		TLM1/ TLM2	CO3	T1	
29.	S/MIME Content Types & Transfer Encodings	1	07.01.19		TLM1/ TLM2	CO3	T1	
30.	S/MIME Functionality & Messages	1	08.01.19		TLM1/ TLM2	CO3	T1	
31.	ASSIGNMENT / QUIZ	1	09.01.19		TLM6	CO3	T1	
32.	IP Security Architecture	1	12.01.19		TLM1/ TLM2	CO3	T1	
33.	Authentication Header	1	26.01.19		TLM1/ TLM2	CO3	T1	
34.	Encapsulating Security Payload	1	28.01.19		TLM1/ TLM2	CO3	T1	
35.	Combining Security Associations	1	29.01.19		TLM1/ TLM2	CO3	T1	
36.	TUTORIAL	1	30.01.19		TLM3	CO3	T1	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
37.	Web Security Requirements	1	02.02.19		TLM1/ TLM2	CO4	T1	
38.	Secure Socket Layer (SSL)	1	04.02.19		TLM1/ TLM2	CO4	T1	

39.	SSL Record Protocol	1	05.02.19		TLM1/ TLM2	CO4	T1	
40.	Change Cipher Spec Protocol Alert Protocol	1	06.02.19		TLM1/ TLM2	CO4	T1	
41.	SSL Handshake Protocol	1	09.02.19		TLM1/ TLM2	CO4	T1	
42.	Transport Layer Security	1	11.02.19		TLM1/ TLM2	CO4	T1	
43.	ASSIGNMENT / QUIZ	1	12.02.19		TLM6	CO4	T1	
44.	SET Requirements & Features	1	13.02.19		TLM1/ TLM2	CO4	T1	
45.	SET Participants & Sequence of events	1	16.02.19		TLM1/ TLM2	CO4	T1	
46.	Construction of Dual Signature & SET Transaction Types	1	18.02.19		TLM1/ TLM2	CO4	T1	
47.	Purchase Request by Cardholder	1	19.02.19		TLM1/ TLM2	CO4	T1	
48.	Customer Purchase Request Verification by Merchant	1	20.02.19		TLM1/ TLM2	CO4	T1	
49.	TUTORIAL	1	23.02.19		TLM3	CO4	T1	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
50.	Intruders	1	25.02.19		TLM1	CO5	T1	
51.	Viruses and Related Threats	1	26.02.19		TLM1/ TLM2	CO5	T1	
52.	Virus Countermeasures	1	27.02.19		TLM1/ TLM2	CO5	T1	
53.	ASSIGNMENT / QUIZ	1	02.03.19		TLM6	CO5	T1	
54.	Firewall Characteristics	1	04.03.19		TLM1	CO5	T1	
55.	Types of Firewalls	1	05.03.19		TLM1/ TLM2	CO5	T1	
56.	Trusted System	1	06.03.19		TLM1/ TLM2	CO5	T1	
57.	Introduction to Database Security and authorization	1	09.03.19		TLM1/ TLM2	CO5	T1	
58.	TUTORIAL	1	11.03.19		TLM3	CO5	T1	
59.	REVISION	1	12.03.19		TLM1/ TLM2	CO5	T1	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
60.	Substitution & Transposition Techniques	1	26.03.18		TLM1	CO1	R1	
61.	Fermat's & Eluers Theorem	1	27.03.18		TLM1	CO2	R1	

62.	Chinese Remainder Theorem	1	30.03.18		TLM1	CO2	R1	
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Teaching Learning Methods					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	19-11-2018	12-01-2017	7+1
Sankranthi Holidays	13-01-2018	17-01-2018	5 Days
I Mid Examinations	18-01-2018	24.01.2018	1
II Phase of Instructions	25-01-2018	30-03-2018	9
II Mid Examinations	01-04-2018	06-04-2018	1
Preparation and Practicals	08-04-2018	20-04-2018	2
Semester End Examinations	22-04-2018	04-05-2018	2

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz - 1	1	A1=5
Assignment/Quiz - 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz - 3	3	A3=5
Assignment/Quiz - 4	4	A4=5
Assignment/Quiz - 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\%$ of Max(B1,B2)+25% of Min(B1,B2)	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25

Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

Course Instructor

Course Coordinator

Module Coordinator

HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (A)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(Autonomous & Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,

NAAC Accredited with 'A' grade, Certified by ISO 9001:2015)

L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

PROGRAM : B.Tech., VI-Sem., CSE
ACADEMIC YEAR : 2018-19
COURSE NAME & CODE : UML Design - S415
L-T-P STRUCTURE : 3-1-0
COURSE CREDITS : 3
COURSE INSTRUCTOR: Mr. Shaik Johny Basha
COURSE COORDINATOR : Mr. Thoka Udaya Kumar
MODULE COORDINATOR : Dr. Ch. Venkata Narayana
PRE-REQUISITE: Knowledge of Object Oriented Methods

COURSE OBJECTIVE:

The main objective of this course is that the students become familiar with all phases of OOAD and master the main features of the UML. They come to know about the main concepts of Object Technologies and how to apply them at work and develop the ability to analyze and solve challenging problem in various domains. And Learn the Object Design Principles and understand how to apply them towards implementation.

COURSE OUTCOMES (CO):

CO1: Identify the basic elements of modeling such as Things, Relationships and Diagrams depending on the views of UML Architecture and SDLC.

CO2: Apply basic and Advanced Structural Modeling Concepts for designing real time applications.

CO3: Design Class and Object Diagrams that represent Static Aspects of a Software System.

CO4: Analyze Dynamic Aspects of a Software System using Use Case, Interaction and Activity Diagrams.

CO5: Apply techniques of State Chart Diagrams and Implementation Diagrams to model behavioral aspects and Runtime environment of Software Systems

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	1	-	-	-	-	-	-	-	-	-	1	1	-	3
CO2	2	3	3	-	-	-	-	-	-	-	-	1	1	-	3
CO3	3	3	3	-	-	-	-	-	-	-	-	1	1	-	3
CO4	2	3	3	-	-	-	-	-	-	-	-	1	1	-	3
CO5	2	3	3	-	-	-	-	-	-	-	-	1	1	-	3

Note: 1- Slight (Low), **2** - Moderate (Medium), **3** - Substantial (High)

BOS APPROVED TEXT BOOKS:

T1 Grady Booch, James Rumbaugh, Ivar Jacobson “The Unified Modeling Language User Guide, Pearson Education, 2nd edition.

BOS APPROVED REFERENCE BOOKS:

R1 Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.

R2 Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.

R3 Atul Kahate: Object Oriented Analysis & Design, TMH Companies.

R4 Craig Larman, Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Pearson Education.

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

UNIT – 1: INTRODUCTION TO UML

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	History of UML	1	20/11/18		TLM1	CO1	T1	
2.	Why Modeling? and Importance of Modeling	1	23/11/18		TLM1, TLM2	CO1	T1	
3.	Principles of Modeling and Object Oriented Modeling	1	24/11/18		TLM1, TLM2	CO1	T1	
4.	Overview of the UML	1	27/11/18		TLM1	CO1	T1	
5.	Conceptual Model of the UML & Building Blocks: Things – Part 1	1	28/11/18		TLM1, TLM2, TLM8	CO1	T1	
6.	Building Blocks: Things – Part 2	1	30/11/18		TLM1, TLM2, TLM8	CO1	T1, R1	
7.	Relationships with Examples	1	01/12/18		TLM1, TLM2, TLM8	CO1	T1, R1	
8.	UML Diagrams	1	04/12/18		TLM1, TLM2, TLM8	CO1	T1, R1	
9.	Rules of the UML & Common Mechanisms in the UML	1	05/12/18		TLM1, TLM2	CO1	T1, R1	
10.	Extensible Mechanisms and UML Architecture	1	07/12/18		TLM1, TLM2, TLM8	CO1	T1	
11.	Software Development Life Cycle	1	08/12/18		TLM1, TLM2	CO1	T1	
12.	TUTORIAL – 1	1	11/12/18		TLM3	CO1	---	
13.	Assignment / Quiz – 1	1	12/12/18		TLM6	CO1	---	
No. of classes required to complete UNIT-I:		13	No. of classes taken:					

UNIT – 2: BASIC AND ADVANCED STRUCTURAL MODELING

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	Text Book followed	HOD Sign
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		Required	Completion	Completion	Methods	COs		Weekly
14.	Classes	1	14/12/18		TLM1, TLM2	CO2	T1	
15.	Relationships	2	15/12/18 18/12/18		TLM1, TLM2	CO2	T1	
16.	Common Mechanisms of Class Diagram	1	19/12/18		TLM1, TLM2	CO2	T1	
17.	Different Diagrams	1	21/12/18		TLM1, TLM2	CO2	T1	
18.	Advanced Classes	2	22/12/18 26/12/18		TLM1, TLM2	CO2	T1, R2	
19.	Advanced Relationships	2	28/12/18 29/12/18		TLM1, TLM2	CO2	T1, R2	
20.	Interfaces	1	02/01/19		TLM1, TLM2	CO2	T1, R2	
21.	Types & Roles	1	04/01/19		TLM1, TLM2	CO2	T1, R2	
22.	Packages	1	05/01/19		TLM1, TLM2	CO2	T1, R2	
23.	Case Study	2	08/01/19 09/01/19		TLM9	CO2	T1	
24.	TUTORIAL – 2	1	11/01/19		TLM3	CO2	---	
25.	Assignment / Quiz – 2	1	12/01/19		TLM6	CO2	---	
No. of classes required to complete UNIT-II:		16	No. of classes taken:					

UNIT – 3: CLASS & OBJECT DIAGRAMS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
26.	Class Diagrams: Terms & Concepts of Class Diagram	1	25/01/19		TLM1, TLM2	CO3	T1, R2	
27.	Modeling Techniques for Class Diagram	2	29/01/19 30/01/19		TLM1, TLM2, TLM8	CO3	T1, R2	
28.	Case Study	1	01/02/19		TLM9	CO3	T1	
29.	Object Diagrams: Terms & Concepts	1	02/02/19		TLM1, TLM2	CO3	T1, R2	
30.	Modeling Techniques for Object Diagram	1	05/02/19		TLM1, TLM2, TLM8	CO3	T1, R2	
31.	Case Study	1	06/02/19		TLM9	CO3	T1	
32.	TUTORIAL – 3	1	08/02/19		TLM3	CO3	---	
33.	Assignment / Quiz – 3	1	09/02/19		TLM6	CO3	---	
No. of classes required to complete UNIT-III:		09	No. of classes taken:					

UNIT – 4: BASIC BEHAVIORAL MODELING

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Interactions	2	12/02/19 13/02/19		TLM1, TLM2	CO4	T1	
35.	Interaction Diagrams –Part 1	1	15/02/19		TLM1, TLM2	CO4	T1	
36.	Interaction Diagrams –Part 2	1	16/02/19		TLM1, TLM2,	CO4	T1	

					TLM8			
37.	Use Cases	1	19/02/19		TLM1, TLM2	CO4	T1	
38.	Use Case Diagrams	2	20/02/19 22/02/19		TLM1, TLM2, TLM8	CO4	T1	
39.	Activity Diagrams – Part 1	1	23/02/19		TLM1, TLM2	CO4	T1	
40.	Activity Diagrams – Part 2	1	26/02/19		TLM1, TLM2, TLM8	CO4	T1	
41.	Case Study	1	27/02/19		TLM9	CO4	T1	
42.	TUTORIAL – 4	1	01/03/19		TLM3	CO4	---	
43.	Assignment / Quiz – 4	1	02/03/19		TLM6	CO4	---	
No. of classes required to complete UNIT-IV		12	No. of classes taken:					

UNIT – 5: ADVANCED BEHAVIORAL MODELING & ARCHITECTURAL MODELING

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
44.	Advanced Behavioral Modeling: Events and Signals	2	05/03/19 06/03/19		TLM1, TLM2	CO5	T1	
45.	State Machines	2	08/03/19 09/03/19		TLM1, TLM2	CO5	T1	
46.	Processes and Threads	1	12/03/19		TLM1, TLM2	CO5	T1	
47.	Time and Space	1	13/03/19		TLM1, TLM2	CO5	T1	
48.	State Chart Diagrams	1	15/03/19		TLM1, TLM2, TLM8	CO5	T1	
49.	Architectural Modeling: Component and Deployment	1	16/03/19		TLM1, TLM2	CO5	T1	
50.	Component Diagrams	1	19/03/19		TLM1, TLM2	CO5	T1	
51.	Deployment Diagrams	1	20/03/19		TLM1, TLM2	CO5	T1	
52.	Case Study	1	22/03/19		TLM9	CO5	T1	
53.	TUTORIAL – 5	1	23/03/19		TLM3	CO5	---	
54.	Assignment / Quiz – 5	1	26/03/19		TLM6	CO5	---	
No. of classes required to complete UNIT-V		13	No. of classes taken:					

Contents beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
55.	Introduction to Design Patterns	1	27/03/19					
56.	Catalog of Design Pattern	1	29/03/19					
57.	How Design Patterns solve day-to-day problems?	1	30/03/19					

Teaching Learning Methods					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\%$ of Max(B1,B2)+25% of Min(B1,B2)	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

1. Programming Paradigms:

To inculcate algorithmic thinking, formulation techniques and visualization, leading to problem solving skills using different programming paradigms.

2. Data Engineering:

To inculcate an ability to Analyze, Design and implement data driven applications into the students.

3. Software Engineering:

Develop an ability to implement various processes / methodologies /practices employed in design, validation, testing and maintenance of software products.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. Shaik Johny Basha	Mr. T. Udaya Kumar	Dr. Ch. Venkata Narayana	Dr. Ch. Venkata Narayana
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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (A)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(Autonomous & Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,

NAAC Accredited with 'A' grade, Certified by ISO 9001:2015)

L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

COURSE HANDOUT

PROGRAM : B.Tech., VI-Sem., CSE

ACADEMIC YEAR : 2018-19

COURSE NAME & CODE : UML Design - S415

L-T-P STRUCTURE : 3-1-0

COURSE CREDITS : 3

COURSE INSTRUCTOR: Mr. Thoka Udaya Kumar

COURSE COORDINATOR : Mr. Thoka Udaya Kumar

MODULE COORDINATOR : Dr. Ch. Venkata Narayana

PRE-REQUISITE: Knowledge of Object Oriented Methods

COURSE OBJECTIVE:

The main objective of this course is that the students become familiar with all phases of OOAD and master the main features of the UML. They come to know about the main concepts of Object Technologies and how to apply them at work and develop the ability to analyze and solve challenging problem in various domains. And Learn the Object Design Principles and understand how to apply them towards implementation.

COURSE OUTCOMES (CO):

CO1: Identify the basic elements of modeling such as Things, Relationships and Diagrams depending on the views of UML Architecture and SDLC.

CO2: Apply basic and Advanced Structural Modeling Concepts for designing real time applications.

CO3: Design Class and Object Diagrams that represent Static Aspects of a Software System.

CO4: Analyze Dynamic Aspects of a Software System using Use Case, Interaction and Activity Diagrams.

CO5: Apply techniques of State Chart Diagrams and Implementation Diagrams to model behavioral aspects and Runtime environment of Software Systems

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	1	-	-	-	-	-	-	-	-	-	1	1	-	3
CO2	2	3	3	-	-	-	-	-	-	-	-	1	1	-	3
CO3	3	3	3	-	-	-	-	-	-	-	-	1	1	-	3
CO4	2	3	3	-	-	-	-	-	-	-	-	1	1	-	3
CO5	2	3	3	-	-	-	-	-	-	-	-	1	1	-	3

Note: 1- Slight (Low), **2** - Moderate (Medium), **3** - Substantial (High)

BOS APPROVED TEXT BOOKS:

T1 Grady Booch, James Rumbaugh, Ivar Jacobson “The Unified Modeling Language User Guide, Pearson Education, 2nd edition.

BOS APPROVED REFERENCE BOOKS:

R1 Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.

R2 Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.

R3 Atul Kahate: Object Oriented Analysis & Design, TMH Companies.

R4 Craig Larman, Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Pearson Education.

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

UNIT – 1: INTRODUCTION TO UML

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	History of UML	1	22/11/18		TLM1	CO1	T1	
2.	Why Modeling? and Importance of Modeling	1	23/11/18		TLM1, TLM2	CO1	T1	
3.	Principles of Modeling and Object Oriented Modeling	1	24/11/18		TLM1, TLM2	CO1	T1	
4.	Overview of the UML	1	28/11/18		TLM1	CO1	T1	
5.	Conceptual Model of the UML & Building Blocks: Things – Part 1	1	29/11/18		TLM1, TLM2, TLM8	CO1	T1	
6.	Building Blocks: Things – Part 2	1	30/11/18		TLM1, TLM2, TLM8	CO1	T1, R1	
7.	Relationships with Examples	1	01/12/18		TLM1, TLM2, TLM8	CO1	T1, R1	
8.	UML Diagrams	1	05/12/18		TLM1, TLM2, TLM8	CO1	T1, R1	
9.	Rules of the UML & Common Mechanisms in the UML	1	06/12/18		TLM1, TLM2	CO1	T1, R1	
10.	Extensible Mechanisms and UML Architecture	1	07/12/18		TLM1, TLM2, TLM8	CO1	T1	
11.	Software Development Life Cycle	1	12/12/18		TLM1, TLM2	CO1	T1	
12.	TUTORIAL – 1	1	13/12/18		TLM3	CO1	---	
13.	Assignment / Quiz – 1	1	14/12/18		TLM6	CO1	---	
No. of classes required to complete UNIT-I:		13	No. of classes taken:					

UNIT – 2: BASIC AND ADVANCED STRUCTURAL MODELING

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	Text Book followed	HOD Sign
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		Required	Completion	Completion	Methods	COs		Weekly
14.	Classes	1	15/12/18		TLM1, TLM2	CO2	T1	
15.	Relationships	2	19/12/18 20/12/18		TLM1, TLM2	CO2	T1	
16.	Common Mechanisms of Class Diagram	1	21/12/18		TLM1, TLM2	CO2	T1	
17.	Different Diagrams	2	22/12/18 26/12/18		TLM1, TLM2	CO2	T1	
18.	Advanced Classes	2	27/12/18 28/12/18		TLM1, TLM2	CO2	T1, R2	
19.	Advanced Relationships	2	29/12/18 02/01/19		TLM1, TLM2	CO2	T1, R2	
20.	Interfaces	1	03/01/19		TLM1, TLM2	CO2	T1, R2	
21.	Types & Roles	1	04/01/19		TLM1, TLM2	CO2	T1, R2	
22.	Packages	1	05/01/19		TLM1, TLM2	CO2	T1, R2	
23.	Case Study	1	09/01/19		TLM9	CO2	T1	
24.	TUTORIAL - 2	1	10/01/19		TLM3	CO2	---	
25.	Assignment / Quiz - 2	1	11/01/19		TLM6	CO2	---	
No. of classes required to complete UNIT-II:		16	No. of classes taken:					

UNIT - 3: CLASS & OBJECT DIAGRAMS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
26.	Class Diagrams: Terms & Concepts of Class Diagram	1	25/01/19		TLM1, TLM2	CO3	T1, R2	
27.	Modeling Techniques for Class Diagram	2	30/01/19 31/01/19		TLM1, TLM2, TLM8	CO3	T1, R2	
28.	Case Study	1	01/02/19		TLM9	CO3	T1	
29.	Object Diagrams: Terms & Concepts	1	02/02/19		TLM1, TLM2	CO3	T1, R2	
30.	Modeling Techniques for Object Diagram	1	06/02/19		TLM1, TLM2, TLM8	CO3	T1, R2	
31.	Case Study	1	07/02/19		TLM9	CO3	T1	
32.	TUTORIAL - 3	1	08/02/19		TLM3	CO3	---	
33.	Assignment / Quiz - 3	1	13/02/19		TLM6	CO3	---	
No. of classes required to complete UNIT-III:		09	No. of classes taken:					

UNIT - 4: BASIC BEHAVIORAL MODELING

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Interactions	2	14/02/19 15/02/19		TLM1, TLM2	CO4	T1	
35.	Interaction Diagrams -Part 1	1	16/02/19		TLM1, TLM2	CO4	T1	
36.	Interaction Diagrams -Part 2	1	20/02/19		TLM1, TLM2,	CO4	T1	

					TLM8			
37.	Use Cases	1	21/02/19		TLM1, TLM2	CO4	T1	
38.	Use Case Diagrams	2	22/02/19 23/02/19		TLM1, TLM2, TLM8	CO4	T1	
39.	Activity Diagrams – Part 1	1	27/02/19		TLM1, TLM2	CO4	T1	
40.	Activity Diagrams – Part 2	1	28/02/19		TLM1, TLM2, TLM8	CO4	T1	
41.	Case Study	1	01/03/19		TLM9	CO4	T1	
42.	TUTORIAL – 4	1	02/03/19		TLM3	CO4	---	
43.	Assignment / Quiz – 4	1	06/03/19		TLM6	CO4	---	
No. of classes required to complete UNIT-IV		12	No. of classes taken:					

UNIT – 5: ADVANCED BEHAVIORAL MODELING & ARCHITECTURAL MODELING

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
44.	Advanced Behavioral Modeling: Events and Signals	2	07/03/19		TLM1, TLM2	CO5	T1	
45.	State Machines	1	08/03/19		TLM1, TLM2	CO5	T1	
46.	Processes and Threads	1	13/03/19		TLM1, TLM2	CO5	T1	
47.	Time and Space	1	14/03/19		TLM1, TLM2	CO5	T1	
48.	State Chart Diagrams	1	15/03/19		TLM1, TLM2, TLM8	CO5	T1	
49.	Architectural Modeling: Component and Deployment	1	16/03/19		TLM1, TLM2	CO5	T1	
50.	Component Diagrams	1	20/03/19		TLM1, TLM2	CO5	T1	
51.	Deployment Diagrams	1	22/03/19		TLM1, TLM2	CO5	T1	
52.	Case Study	1	23/03/19		TLM9	CO5	T1	
53.	TUTORIAL – 5	1	27/03/19		TLM3	CO5	---	
54.	Assignment / Quiz – 5	1	28/03/19		TLM6	CO5	---	
No. of classes required to complete UNIT-V		13	No. of classes taken:					

Contents beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
55.	Introduction to Design Patterns	1	29/03/19					
56.	Catalog of Design Pattern		29/03/19					
57.	How Design Patterns solve day-to-day problems?	1	30/03/19					

Teaching Learning Methods					
TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\%$ of Max(B1,B2)+25% of Min(B1,B2)	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO I: To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional.

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
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1. Programming Paradigms:

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Name of the Faculty	Mr. T. Udaya Kumar	Mr. T. Udaya Kumar	Dr. Ch. Venkata Narayana	Dr. Ch. Venkata Narayana
Signature				

4.	Unified Library Application	2			5
5.	Unified Library Application	2			5
6.	Student Admission Procedure	2			5
7.	Student Admission Procedure	2			5
8.	Student Admission Procedure	2			5
9.	Online Book Shopping	2			5
10.	Online Book Shopping	2			5
11.	Hospital Management System	2			5
12.	Hospital Management System	2			5
13.	Cellular Network	2			5
14.	Cellular Network	2			5

Contents beyond the Syllabus:

S. No.	Programs to be Covered	No. of Classes		Date	DM
		As per the Schedule	Taken		
1.	Ticket Vending Machine	2			5
2.	Ticket Vending Machine	2			5
3.	Payroll System	2			5
4.	Ticket Vending Machine	2			5

Delivery Methods (DM):

1. Chalk & Talk
2. ICT Tools
3. Tutorial
4. Assignment/Test/Quiz
5. Laboratory/Field Visit
6. Web based Learning

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	LESSON PLAN			
	Department : CSE Course : UML DESIGN LAB (L183) Section : A/Sec	Program : B.Tech SEM : VI A.Y. : 2018-19		

1. Prerequisite: Experience of System Development

2. Course Educational Objectives (CEOs):

On completion of this course, a student will be familiar with principles behind the Object Oriented Design and able to apply those principles in a project setting. Students will analyze applications and know how to take a pragmatic approach to software design and development.

3. Course Outcomes (COs): At the end of the course, the student will be able to:

CO1: Analyze Software Requirements for the given Software Application.

CO2: Develop the UML Diagrams to view Software System in Static and Dynamic Aspects.

CO3: Describe the Dynamic Structure and Behavior of the design.

4. Course Articulation Matrix:

Course Code	CO	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
L183	CO1	2	3	1	1	3	1	-	1	2	2	1	2	-	-	3
	CO2	2	1	3	1	3	1	-	1	2	2	1	2	1	1	3
	CO3	2	1	3	1	3	1	-	1	2	2	1	2	1	-	3
		1 = Slight (Low)				2 = Moderate (Medium)				3 = Substantial (High)						

5. Schedule:

S.NO	Programs to be Covered	No. of Classes		Date	DM
		As per the Schedule	Taken		
1.	Introduction to Rational Rose Software & Getting Familiarity with UML Notations	2			5
2.	Automatic Teller Machine (ATM)	2			5
3.	Automatic Teller Machine (ATM)	2			5
4.	Unified Library Application	2			5
5.	Unified Library Application	2			5
6.	Student Admission Procedure	2			5
7.	Student Admission Procedure	2			5
8.	Student Admission Procedure	2			5
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8	Problems using software	Numerical treatment	
9	Self study	Design / Exercises	

Detailed Lesson Plan

S.NO	TOPIC TO BE COVERED	Date		TLP	DM	AM
		Tentative	Actual			
1	Introduction to Web Architecture and Web Technologies.	28-11-18		1	1,2	2,4,6
2	Experiment-1	05-12-18		1	1,2	
3	Experiment-2	12-12-18		1	1,2	
4	Experiment-3	19-12-18		1	1,2	
5	Experiment-4	26-12-18		1	1,2	
6	Experiment-5	02-01-19		1	1,2	
7	Experiment-6	09-01-19		1	1,2	
8	Experiment-7	30-01-19		1	1,2	
09	Experiment-8	06-02-19		1	1,2	
10	Experiment-9	13-02-19		1	1,2	
11	Experiment-10	20-02-19		1	1,2	
12	Experiment-11	27-02-19		1	1,2	
13	Experiment-12	06-03-19		1	1,2	
14	Experiment-13	13-03-19		1	1,2	
15	Revision of all experiments(Practice Session)	20-03-19		1	1,2	
16	Internal Exam	27-03-19				

Assessment Summary:

Assessment Task	Weight age (Marks)	Course Outcomes		
		CO1	CO2	CO3
Day-Day Performance	10			
Record	05			
Internal Test	10			
Surprise Tests	--			
Model Exams	--			
End Exam	50			
Total	75			

Mapping Course Outcomes with Programme Outcomes:

Course Code	Programme Outcomes															
	COs	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
L184	CO1	1	2	3	1	3	-	-	1	1	1	-	1	3	2	-
	CO2	1	2	3	1	3	-	-	1	1	1	-	2	3	2	-
	CO3	1	2	3	1	3	-	-	1	1	1	-	2	3	3	-

1 = Slight (Low)

2 = Moderate (Medium)

3-Substantial (High)

	Instructor	Course	Module	HOD
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		Coordinator	Coordinator	
Name	N. Srinivasa Rao	N. Srinivasa Rao	Dr. D. Veeraiah	Dr. Ch.V.Narayana
Sign with Date				

8	Problems using software	Numerical treatment	
9	Self study	Design / Exercises	

Detailed Lesson Plan

S.NO	TOPIC TO BE COVERED	Date		TLP	DM	AM
		Tentative	Actual			
1	Introduction to Web Architecture and Web Technologies.	19-11-18		1	1,2	2,4,6
2	Experiment-1	26-11-18		1	1,2	
3	Experiment-2	03-12-18		1	1,2	
4	Experiment-3	10-12-18		1	1,2	
5	Experiment-4	17-12-18		1	1,2	
6	Experiment-5	24-12-18		1	1,2	
7	Experiment-6	31-12-18		1	1,2	
8	Experiment-7	07-01-19		1	1,2	
09	Experiment-8	28-01-19		1	1,2	
10	Experiment-9	04-02-19		1	1,2	
11	Experiment-10	11-02-19		1	1,2	
12	Experiment-11	18-02-19		1	1,2	
13	Experiment-12	25-02-19		1	1,2	
14	Experiment-13	11-03-19		1	1,2	
15	Revision of all experiments(Practice Session)	18-03-19		1	1,2	
16	Internal Exam	25-03-19				

Assessment Summary:

Assessment Task	Weight age (Marks)	Course Outcomes		
		CO1	CO2	CO3
Day-Day Performance	10			
Record	05			
Internal Test	10			
Surprise Tests	--			
Model Exams	--			
End Exam	50			
Total	75			

Mapping Course Outcomes with Programme Outcomes:

Course Code	Programme Outcomes															
	COs	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
L184	CO1	1	2	3	1	3	-	-	1	1	1	-	1	3	2	-
	CO2	1	2	3	1	3	-	-	1	1	1	-	2	3	2	-
	CO3	1	2	3	1	3	-	-	1	1	1	-	2	3	3	-

1 = Slight (Low)

2 = Moderate (Medium)

3-Substantial (High)

	Instructor	Course	Module	HOD
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		Coordinator	Coordinator	
Name	P. Vamsi Naidu	N. Srinivasa Rao	Dr. D. Veeraiah	Dr. Ch.V.Narayana
Sign with Date				