

**E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI – 625 014.**

*(An Autonomous Institution – Affiliated to Madurai Kamaraj University)*

Re-accredited (**3<sup>rd</sup> Cycle**) with Grade **A+** & **CGPA 3.51** by NAAC

## **DEPARTMENT OF INFORMATION TECHNOLOGY**



**TANSCHÉ-CBCS with OBE**

**MASTER OF SCIENCE**

**PROGRAMME CODE - PI**

**COURSE STRUCTURE**

(w.e.f. 2023 – 2024 Batch onwards)

**E.M.G.YADAVAWOMEN'SCOLLEGE, MADURAI-14.**

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)

Re-accredited (3<sup>rd</sup> Cycle) with Grade A<sup>+</sup> & CGPA 3.51 by NAAC**DEPARTMENTOFINFORMATIONTECHNOLOGY-PG**

TANSCH – CBCS with OBE

**COURSE STRUCTURE**

(w.e.f. 2023 –2024 Batch onwards)

Semester	Part	Course Code	Course Title	Teaching hrs. (per week)	Duration of Exam (hrs.)	Marks Allotted			CREDITS
						CIA	SE	Total	
I	Part III	23OPIT11	<b>Core Course – 1</b> Python Programming	7	3	25	75	100	5
		23OPIT11P	<b>Core Course – 2</b> Python Programming Lab	7	3	40	60	100	5
		23OPIT12P	<b>Core Course – 3</b> Web Development using Word Press Lab	6	3	40	60	100	4
		23OPITDSE1A	<b>Elective - I</b> Computer System Architecture	5	3	25	75	100	4
		23OPITDSE1C	<b>Elective – II</b> Data Structures and Algorithms	5	3	25	75	100	4
II	Part III	23OPIT21	<b>Core Course – 4</b> Database Systems	6	3	25	75	100	4
		23OPIT21P	<b>Core Course – 5</b> RDBMS Lab	6	3	40	60	100	4
		23OPIT22P	<b>Core Course – 6</b> Open Source Technologies Lab	6	3	40	60	100	4
		23OPITDSE2B	<b>Elective - III</b> Operating Systems	5	3	25	75	100	4
		23OPITDSE2D	<b>Elective - IV</b> Advanced Software Engineering	5	3	25	75	100	4
	Part IV	23OPITSEC21	<b>Skill Enhancement Course – SEC 1</b> Multimedia	2	3	25	75	100	2

Semester	Part	Course Code	Course Title	Teaching hrs. (per week)	Duration of Exam (hrs.)	Marks Allotted			CREDITS
						CIA	SE	Total	
III	Part III	23OPIT31	<b>Core Course – 7</b> Advanced Java	6	3	25	75	100	4
		23OPIT31P	<b>Core Course – 8</b> Advanced Java Lab	6	3	40	60	100	4
		23OPIT32P	<b>Core Course – 9</b> Mobile Application Development Lab	6	3	40	60	100	4
			<b>Elective - V</b> Internet of Things	5	3	25	75	100	4
		23OPIT32	<b>Core Course – 10 (Industry Module)</b> Software Project Management	5	3	25	75	100	4
	Part IV	23OPITSEC3P	<b>Skill Enhancement Course – SEC 2</b> Office Automation and ICT Tools Lab	2	3	40	60	100	2
		23OPITIN3	Internship / Industrial Activity	-	-	-	-	-	2
IV	Part III	23OPIT41	<b>Core Course – 11</b> .NET with C# Programming	6	3	25	75	100	5
		23OPIT4P	<b>Core Course – 12</b> .NET with C# Programming Lab	6	3	40	60	100	5
		23OPITPR4	<b>Core Course – 13</b> Project with Viva-voce	10	3	20	80	100	7
			<b>Elective – VI</b> Research Methodology	5	3	25	75	100	3
	Part IV	23OPITSEC4P	<b>Skill Enhancement Course – SEC 3</b> React JS Lab	3	3	40	60	100	2
	Part V	23OP5EA4	<b>Extension Activity</b>	-	-	-	-	-	1

**Semester I: Elective I and Elective II****Elective I** to be chosen from **Group A** and **Elective II** to be chosen from **Group B****Group A:**

1. Computer System Architecture - 23OPITDSE1A
2. Principles of Compiler Design - 23OPITDSE1B

**Group B:**

1. Data Structures and Algorithms - 23OPITDSE1C
2. Object Oriented Analysis and Design - 23OPITDSE1D

**Semester II: Elective III & Elective IV****Elective III** to be chosen from **Group C** and **Elective IV** to be chosen from **Group D****Group C:**

1. Digital Image Processing - 23OPITDSE2A
2. Operating Systems - 23OPITDSE2B

**Group D:**

1. Human Computer Interaction - 23OPITDSE2C
2. Advanced Software Engineering - 23OPITDSE2D

**Semester III : Elective V****Elective V** to be chosen from Group E**Group E:**

1. Intelligent Systems – 23OPITDSE3A
2. Internet of Things – 23OPITDSE3B

**Semester IV: Elective VI****Elective VI** to be chosen from Group F**Group F:**

1. Research Methodology – 23OPITDSE4A
2. Trends in Computing – 23OPITDSE4B

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Core	23OPIT31	Advanced Java	4	6	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓	✓	

### Course Objectives:

1. To understand the basic concepts of core principles of the Java language and gain knowledge.
2. To learn the functions, packages and Interfaces.
3. To gain the knowledge on Exception handling and multithreaded programming.
4. To expertise on Java server Packages.
5. to develop dynamic Web applications using applet, servlet, jsp and JavaBean.

### Course Content:

UNIT	Course Content	No. of Hours	K Level	CLO
I	<b>The Genesis of Java:</b> Java's Magic, The Java Buzzwords-An Overview of Java - Data types, Variables, Arrays-Operators-Control Statements- Introducing Classes – A Close Look at Methods and Classes-Inheritance.	18	Up to K4	CLO1
II	String Handling Functions – Collections Framework: Collection Classes, String Tokenizer, Date, Calendar - Abstract Classes - Packages and Interfaces: Packages – Access Protection Importing Packages – Interfaces.	18	Up to K4	CLO2
III	Exception Handling: Exception types – Creating your own exceptions - Multithreaded Programming: Creating a Thread, Creating Multiple Threads, Using isAlive() and join(), Thread Priorities, Synchronization, Inter-thread	18	Up to K4	CLO3

	Communication, Suspending, Resuming and Stopping Threads – JDBC			
IV	The Applet Class-Event Handling – Introducing the AWT: Working with windows, graphics and Text, Using AWT Controls, Layout Managers and Controls - Developing Java Server Pages	18	Up to K5	CLO4
V	<b>Developing Servlets</b> -Structuring Web application with the MVC pattern – Sessions andCookies - Using JSP tags with JavaBeans	18	Up to K5	CLO5

**Text Books:**

1. Herbert Schildt. (2004). “Java 2: The Complete Reference”. Fifth Edition, Tata McGraw Hill. New Delhi.
2. Joel Murach. (2008). “Andrea Steelman, Murach’s Java Servlets and JSP”. Second Edition, Shroff Publishers.

**Reference Books:**

1. Matthew Mac Donald. (2002). “ASP.NET : The Complete Reference”. MC Graw Hill.
2. VladaMatena. (2003). “Applying Enterprise JavaBeans”. Second Edition. Addison Wesley.
3. Cay S Horstmann & Gary Cornell. Core Java Vol II Advanced Features. Eighth Edition, Addison Wesley.
4. Bruce W Perry (2004), Java Servlets & JSP Cook Book, Second edition, O’reilly Media.

**Websites and e-Learning resources**

1. <http://netbeans.org/kb/docs/javaee/javaee-intro.html>
2. <http://www.jsptube.com/>
3. <http://articles.sitepoint.com/article/java-servlets-1>
4. <http://www.java-tips.org/java-tutorials/tutorials/introduction-to-java-servlets-with-netbeans.html>
5. <http://download.oracle.com/javase/tutorial/javabeans/index.html>

6. <http://www.javapoint.com/steps-to-connect-to-the-datadase-in-java/> (Unit III: JDBC)

**Rationale for nature of Course:**

- **Knowledge and Skill:** To make students developing well-designed, efficient, and testable code. Conducting software analysis, programming, testing, and debugging.
- **Activities to be given:** Student to be designing, building and maintaining Python applications & websites.

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	Understand and explain programming language constructs, Java mechanisms, OOP and Internet programming concepts	K1 to K4
CO2	Apply logical constructs as well as include Object oriented features, Packages, Interfaces, Exceptions and Threads , JDBC, Internet programming technologies	K1 to K4
CO3	Compare and contrast classical and advanced Java in terms of features, architecture, platform and technologies	K1 to K4
CO4	Choose an approach to solve real world problem from the acquired knowledge of Java	K1 to K5
CO5	Create programs that make strong use of classes and objects and develop JDBC, GUI, Web and Enterprise based applications	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	2	2	2
CO2	3	3	2	3	3	2
CO3	3	2	3	2	3	3
CO4	3	2	3	2	3	3
CO5	3	3	3	3	3	3

## LESSON PLAN

UNIT	Course Content	No. of Hours	Mode of Teaching
I	<b>The Genesis of Java:</b> Java's Magic, The Java Buzzwords-An Overview of Java - Data types, Variables, Arrays-Operators-Control Statements- Introducing Classes – A Close Look at Methods and Classes-Inheritance	18	Chalk and Talk, PPT
II	String Handling Functions – Collections Framework: Collection Classes, String Tokenizer, Date, Calendar - Abstract Classes - Packages and Interfaces: Packages – Access Protection Importing Packages – Interfaces	18	Chalk and Talk, PPT
III	Exception Handling: Exception types – Creating your own exceptions - Multithreaded Programming: Creating a Thread, Creating Multiple Threads, Using isAlive() and join(), Thread Priorities, Synchronization, Inter-thread Communication, Suspending, Resuming and Stopping Threads - JDBC	18	Chalk and Talk, PPT
IV	The Applet Class-Event Handling – Introducing the AWT: Working with windows, graphics and Text, Using AWT Controls, Layout Managers and Controls - Developing Java Server Pages	18	Chalk and Talk, PPT
V	<b>Developing Servlets</b> -Structuring Web application with the MVC pattern – Sessions andCookies - Using JSP tags with JavaBeans	18	Seminar, PPT presentation
	<b>Total</b>	<b>90</b>	

**Course Designer**  
**Mrs.R.Lakshmi**



DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Core Lab	23OPIT31P	Advanced Java Lab	4	6	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

**Course Objectives:**

1. To know the concept of functions in Python.
2. To use basic flow control, including for loops and conditionals read data from text files.
3. To understand the modules and string processing method are design.
4. To analyze the sets, class, object polymorphism for code reusability function.
5. To create the multiple form inheritance, GUI application and connect the working with data.

**Course Content:**

UNIT	Details	No. of Hours	K Level	Course Objectives
I	1. Classes and objects 2. Implementing classes 3. Strings 4. Collection 5. Date and Calendar	18	Up to K4	CO1
II	6. Packages 7. Exception handling 8. Threads	18	Up to K4	CO2
III	9. Applets 10. Event handling	18	Up to K4	CO3
IV	<b>Servlet</b> 11. Simple Web Applications 12. Using Sessions and Cookies 13. Forwarding requests and Redirecting responses 14. Web Applications using Database	18	Up to K5	CO4

V	<b>Bean</b> 15. Developing Simple Beans 16. Use Beans with JSP tags	18	Up to K5	CO5
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**Text Books:**

1. Herbert Schildt, (2004), “Java 2: The Complete Reference”, Fifth Edition, Tata McGraw Hill, New Delhi.
2. Joel Murach, (2008), “Andrea Steelman,,Murach’s Java Servlets and JSP”, Second Edition, Shroff Publishers

**Reference Books:**

Bruce W Perry (2004), Java Servlets & JSP Cook Book, Second edition, O’reilly Media.

**Websites and e-Learning resources**

1. <http://netbeans.org/kb/docs/javaee/javaee-intro.html>
2. <http://www.jsptube.com/>
3. <http://articles.sitepoint.com/article/java-servlets-1>
4. <http://www.java-tips.org/java-tutorials/tutorials/introduction-to-java-servlets-with-netbeans.html>
5. <http://download.oracle.com/javase/tutorial/javabeans/index.html>

**Rationale for nature of Course:**

- **Knowledge and Skill:** To make students developing well-designed, efficient, and testable code. Conducting software analysis, programming, testing, and debugging.
- **Activities to be given:** Student to be designing, building and maintaining Python applications & websites.

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom’s Taxonomy (Upto K level)
CO1	Demonstrate understanding and use of different Java mechanisms for efficient application development	K1 to K4
CO2	Use an appropriate development environment to write, compile and run Java Programs	K1 to K4
CO3	Analyze the problem and apply the appropriate problem solving method with the required building blocks and mechanisms of Core and Advanced Java	K1 to K4

<b>CO4</b>	Test the correctness and consistency of the Java program with different inputs	K1 to K5
<b>CO5</b>	Create simple applications that make use of core java concepts and develop JDBC, GUI, Web and Enterprise based applications	K1 to K5

### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

<b>CO/PSO</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>	<b>PSO 6</b>
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>

### LESSON PLAN:

<b>UNIT</b>	<b>Details</b>	<b>No. of Hours</b>	<b>Mode of Teaching</b>
I	1. Classes and objects 2. Implementing classes 3. Strings 4. Collection 5. Date and Calendar	18	Demo & Practical Session
II	6. Packages 7. Exception handling 8. Threads	18	Demo & Practical Session
III	9. Applets 10. Event handling	18	Demo & Practical Session
IV	<b>Servlet</b> 11. Simple Web Applications 12. Using Sessions and Cookies 13. Forwarding requests and Redirecting responses 14. Web Applications using Database	18	Demo & Practical Session
V	<b>Bean</b> 15. Developing Simple Beans 16. Use Beans with JSP tags	18	Demo & Practical Session

**Course Designer**  
**Mrs.R.Boomadevi**

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Core Lab	23OPIT32P	Mobile Application Development Lab	4	6	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓	✓	

### Course Objectives:

1. To provide the students with the basics of Android Software Development tools.
2. To development of software on mobile platforms and deploying software to mobile devices.
3. To Understand the principles of mobile user interface (UI) and user experience (UX) design.
4. To Learn about mobile-specific Menus with Views.
5. To Apply the acquired knowledge SMS Messaging.

### Course Content:

UNIT	Details	No. of Hours	K Level	Course Objectives
I	Getting Started with Android Programming – Using Eclipse for Android Development – Using Android Emulator - <b>Getting to know the Android User Interface:</b> Understanding the Components of a Screen	18	Up to K4	CO1
II	<b>Designing your User Interface with views:</b> Basic Views – Picker Views – List Views -Displaying Pictures	18	Up to K4	CO2
III	<b>Activities, Fragments and Intents:</b> Understanding Activities – Applying Styles and Themes to an Activity – Displaying a Dialog Window – Displaying a Progress Dialog – Linking Activities Using Intents – Fragments. Using Arrays and Functions	18	Up to K4	CO3
IV	<b>Menus with Views:</b> Option Menu –	18	Up to K5	CO4

	Context Menu. <b>Utilizing the Action Bar:</b> Adding Action Items to the Action Bar – Customizing the Action Items and Application Icon -Working with Audio and Video.			
V	<b>Messaging:</b> SMS Messaging – Sending E- Mail- Data Persistence: Creating and Using Databases – Developing Android Services – Publishing Android Applications	18	Up to K5	CO5
	<b>Total</b>	<b>90</b>		

**Text Book:**

Wei – Meng Lee, (2012), *Beginning Android 4 Application Development*, Wiley India Edition

**Reference Books:**

1. OnurCinar, (2012), *Android Apps with Eclipse*, Apress, Springer(India) Private Limited.
2. RetoMeier, (2010), *Professional Android 2 Application Development*, Wiley India Edition

**Websites and e-Learning resources**

1. <http://developer.android.com/training/basics/firstapp/index.html>
2. [www.vogella.com/articles/Android/article.html](http://www.vogella.com/articles/Android/article.html)
3. [www.coreservlets.com/android-tutorial/](http://www.coreservlets.com/android-tutorial/)
4. [www.edumobile.org/android/category/android-beginner-tutorial](http://www.edumobile.org/android/category/android-beginner-tutorial)
5. <http://www.androidhive.info/2011/11/android-sqlite-database-tutorial/> (Unit V: Ex. No.3(SQLite Database))

**Rationale for nature of Course:**

- **Knowledge and Skill:** To make students developing well-designed, efficient, and testable code. Conducting software analysis, programming, testing, and debugging.
- **Activities to be given:** Student to be designing, building and maintaining application in word press.

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	Demonstrate the setup and configuration of Android Development Environment.	K1 to K4
CO2	Apply the necessary UI components with different styles, themes, views, and layouts	K1 to K4
CO3	Examine and implement the required services such as messaging, mailing,	K1 to K4
CO4	multimedia concepts for the given problem	K1 to K5
CO5	Test and debug the Android applications with different inputs.	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	3
CO2	3	3	3	2	3	3
CO3	3	3	2	2	3	3
CO4	3	3	3	3	3	3
CO5	3	3	2	2	3	3

**LESSON PLAN:**

UNIT	Details	No. of Hours	Mode of Teaching
I	Getting Started with Android Programming – Using Eclipse for Android Development – Using Android Emulator - <b>Getting to know the Android User Interface:</b> Understanding the Components of a Screen	18	Demo & Practical Session
II	<b>Designing your User Interface with views:</b> Basic Views – Picker Views – List Views - Displaying Pictures	18	Demo & Practical Session
III	<b>Activities, Fragments and Intents:</b> Understanding Activities – Applying Styles and Themes to an Activity – Displaying a Dialog Window – Displaying a Progress Dialog – Linking Activities Using Intents – Fragments. Using Arrays and Functions	18	Demo & Practical Session

IV	<b>Menus with Views:</b> Option Menu – Context Menu. <b>Utilizing the Action Bar:</b> Adding Action Items to the Action Bar – Customizing the Action Items and Application Icon -Working with Audio and Video.	18	Demo & Practical Session
V	<b>Messaging:</b> SMS Messaging – Sending E- Mail- Data Persistence: Creating and Using Databases – Developing Android Services – Publishing Android Applications	18	Demo & Practical Session
	<b>Total</b>	<b>90</b>	

**Course Designer**  
**Mrs.S.Sumathi**

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: I M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Elective V	23OPITDSE3A	Intelligent Systems	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓	✓	

### Course Objectives:

1. To acquire knowledge on various intelligent system techniques and methodologies
2. To enriched knowledge on Knowledge representation and problem solving
3. To learn the methods in solving particular engineering problems.
4. To identify the requirements of various Fuzzy expert systems.
5. To analyze the Neuron, Perceptron-Multilayer and neural networks.

### Course Content:

UNIT	Course Content	No. of Hours	K Level	Course Objectives
I	<b>Artificial Intelligence:</b> AI problems-AI technique- <b>Problem Search</b> :-Production Systems – Problem Characteristics – Production system characteristics- <b>Heuristic Search techniques:</b> Generate and Test – Hill Climbing – Constraint Satisfaction, Means-end analysis	15	Up to K4	CO1
II	<b>Knowledge representation issues:</b> Representations and mappings – Approaches to Knowledge representations –Frame problem –. <b>Using Predicate Logic:</b> Representing simple facts in logic - Representing Instance and ISA relationships – Computable functions and predicates – Resolution	15	Up to K4	CO2



III	<p><b>Representing knowledge using rules:</b> Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge.</p> <p><b>Knowledge representation summary:</b> Syntactic and Semantic spectrum of representation-Logic and slot – and-filler structures-Other representational techniques</p>	15	Up to K4	CO3
IV	<p><b>Rule-based expert systems:</b> Introduction-Rules as a knowledge representation technique- players- Structure- Forward chaining and backward chaining inference techniques-</p> <p><b>Fuzzy expert systems:</b> Introduction- Fuzzy sets- Linguistic variables and hedges- Operations - Fuzzy rules- - Building a fuzzy expert system</p>	15	Up to K5	CO4
V	<p><b>Artificial neural networks:</b> Neuron-perceptron- Multilayer neural networks- - The Hopfield network-</p> <p><b>Robotics:</b> Introduction-Robot hardware-Perception-Moving-Robotic software architecture</p>	15	Up to K5	CO5

**TEXTBOOK(S):**

1. Elaine rich and Kelvin Knight, “Artificial Intelligence “, Tata McGraw hill Publication, 3rdEdition, 2009. [Unit - I,II,III]  
Unit I : Chapters 1, 2, 3  
Unit II : Chapters 4, 5  
Unit III: Chapters 6, 11
2. Artificial Intelligence: A Guide to Intelligent Systems, 3rd edition, Michael Negnevitsky, Addison Wesley, 2011.[Unit IV-Chapter 1,2,4,V-Chapter 6]
3. Artificial Intelligence a modern Approach “– Stuart Russell & Peter Norvig, 3<sup>rd</sup> Edition Pearson Education[Unit V-Chapter 25-Robotics]

**REFERENCE BOOK(S):**

1. “Artificial Intelligence a modern Approach “– Stuart Russell & Peter Norvig, 3<sup>rd</sup> Edition, Pearson Education.
2. “Artificial Intelligence “, George F Luger , 4<sup>th</sup> Edition , Pearsons Education Publ, 2002.
3. “Foundations of Artificial Intelligent And Expert Systems”, V S Janaki Raman, K Sarukesi, P Gopalakrishnan, Macmillan India Limited

**Websites and e-Learning resources**

1. <https://www.techopedia.com/definition/190/artificial-intelligence-ai>
2. [https://www.tutorialspoint.com/artificial\\_intelligence/artificial\\_intelligent\\_systems.htm](https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligent_systems.htm)
3. <https://data-flair.training/blogs/heuristic-search-ai/>
4. <http://teaching.csse.uwa.edu.au/units/CITS7212/Lectures/Students/Fuzzy.pdf>
5. <http://engineering.nyu.edu/mechatronics/smart/pdf/Intro2Robotics.pdf>

**Rationale for nature of Course:**

- **Knowledge and Skill:** These include a good understanding of Digital Image Processing.
- **Activities to be given:** Create, test and deploy new image techniques in a timely and efficient manner, while concurrently working with others to meet data acquisition requirements.

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	Outline the applicability, strength and weakness of artificial intelligence in solving computational problems	K1 to K4
CO2	Demonstrate the role of knowledge representation, problem solving and learning in Intelligent-system engineering	K1 to K4
CO3	Identify the characteristics of AI, Knowledge representation, Experts systems and its variants with ANN and robotics.	K1 to K4
CO4	Analyze a comprehensive background in both software and hardware to work with the future of robotics and adaptive systems	K1 to K5
CO5	Assess the scientific background through various real time examples	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	2	2
CO2	3	3	3	3	2	2
CO3	3	2	3	3	3	3
CO4	3	2	2	3	3	2
CO5	3	2	3	3	3	2

**LESSON PLAN:**

UNIT	Course Content	No. of Hours	Course Objectives	Mode of Teaching
I	<b>Artificial Intelligence:</b> AI problems-AI technique- <b>Problem Search</b> :-Production Systems – Problem Characteristics – Production system characteristics- <b>Heuristic Search techniques:</b> Generate and Test – Hill Climbing – Constraint Satisfaction, Means-end analysis	15	CO1	Chalk and Talk, PPT, quiz, on the spot test
II	<b>Knowledge representation issues:</b> Representations and mappings – Approaches to Knowledge representations –Frame problem –. <b>Using Predicate Logic:</b> Representing simple facts in logic - Representing Instance and ISA relationships – Computable functions and predicates – Resolution	15	CO2	Chalk and Talk, PPT, quiz, on the spot test
III	<b>Representing knowledge using rules:</b> Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge. <b>Knowledge representation summary:</b> Syntactic and Semantic spectrum of	15	CO3	Chalk and Talk, PPT,

	representation-Logic and slot – and-filler structures-Other representational techniques			quiz, on the spot test
IV	<b>Rule-based expert systems:</b> Introduction- Rules as a knowledge representation technique- players- Structure- Forward chaining and backward chaining inference techniques- <b>Fuzzy expert systems:</b> Introduction- Fuzzy sets- Linguistic variables and hedges- Operations - Fuzzy rules- - Building a fuzzy expert system	15	CO4	Chalk and Talk, PPT, quiz, on the spot test
V	<b>Artificial neural networks:</b> Neuron-perceptron- Multilayer neural networks- - The Hopfield network- <b>Robotics:</b> Introduction-Robot hardware-Perception-Moving-Robotic software architecture	15	CO5	Seminar, PPT , Group discussion
	<b>Total</b>	75		

**Course Designer**  
**Mrs.G.Amudha**

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Elective V	23OPITDSE3B	Internet of Things	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

**Course Objectives:**

1. To impart the knowledge on IoT.
2. To learn the Architecture, Protocol, various technologies and the application areas relating to IoT
3. To Recognize various devices, sensors and applications in IoT and M2M.
4. to Apply design concept to IoT solutions of logical design using Python.
5. To design issues in IoT Physical Servers & Cloud Offerings.

**Course Content:**

UNIT	Course Content	No. of Hours	K Level	Course Objectives
I	Introduction to IoT - Introduction to Internet of Things: Introduction- Physical Design of IoT- Logical Design of IoT- IoT Enabling Technologies - IoT Levels & Deployment Templates	15	Up to K4	CO1
II	Domain Specific IoT: Introduction-Home Automation-Cities-Environment-Energy-Retail- Logistics-Agriculture-Industry-Health & Lifestyle. IoT and M2M: Introduction - M2M- Difference between IoT and M2M - SDN and NFV for IoT.	15	Up to K4	CO2
III	M2M to IoT- An Architectural Overview: Building an Architecture-Main design principles and needed capabilities-An IoT Architecture Outline- Standard Considerations. M2M and IoT Technology Fundamentals: Devices and Gateways-Local and wide area Networking-Data Management.	15	Up to K4	CO3
	IoT Architecture - Architecture Reference Model: Introduction-Reference Model and Architecture- IoT Reference Model: IoT Domain Model-	15		CO4

	Information Model-Functional Model-Communication Model-Safety, Privacy, Trust, Security Model IoT.		Up to K5	
V	Implementation Examples: The Smart Grid-Introduction-Smart Metering-Smart House-Smart energy city. Case Study: Commercial Building automation today and in the future.	15	Up to K5	CO5

**TEXT BOOK(S):**

1. ArshdeepBahga, Vijay Madiseti, —Internet of Things – A hands-on approach, Universities Press, 2015 (Unit I and II)
2. Jan Holler, VlasiosTsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, “From Machine-to-Machine to the Internet of Things – Introduction to a New Age of Intelligence”, Elsevier, 2014(Unit III, IV and V).

**REFERENCE BOOK(S):**

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, —IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017
2. Olivier Hersent, David Boswarthick, Omar Elloumi , —The Internet of Things – Key applications and Protocols, Wiley, 2012
3. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), —Architecting the Internet of Things, Springer, 2011

**Websites and e-Learning resources**

1. [https://www.tutorialspoint.com/internet\\_of\\_things/](https://www.tutorialspoint.com/internet_of_things/)
2. <https://www.geeksforgeeks.org/introduction-to-internet-of-things-iot-set-1/>
3. [https://www.slideshare.net/khusuma/domain-specific-iot\(Unit-II\)](https://www.slideshare.net/khusuma/domain-specific-iot(Unit-II))
4. [https://www.slideshare.net/PascalBodin/an-introduction-to-m2m-iot-technologies\(Unit-III\)](https://www.slideshare.net/PascalBodin/an-introduction-to-m2m-iot-technologies(Unit-III))
5. [https://www.smartgrid.gov/the\\_smart\\_grid/smart\\_grid.html](https://www.smartgrid.gov/the_smart_grid/smart_grid.html)

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	Outline the fundamental concepts and Terminologies of IoT	K1 to K4
CO2	Determine the IoT enabling technologies, M2M and IoT, fundamentals and technological challenges faced by IoT in terms of Safety, privacy and trust	K1 to K4
CO3	Identify the different levels, models and standards of IoT and application areas in domain specific IoT	K1 to K4
CO4	Analyze the physical design, logical design, architecture Overview of M2M and IoT and reference models of IoT Architecture	K1 to K5
CO5	Assess the application areas and illustrate the implementation of IoT.	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
<b>CLO1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CLO2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CLO3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CLO4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CLO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

**LESSON PLAN:**

UNIT	Course Content	No. of Hours	Course Objectives	Mode of Teaching
I	Introduction to IoT - Introduction to Internet of Things: Introduction- Physical Design of IoT- Logical Design of IoT- IoT Enabling Technologies - IoT Levels & Deployment Templates	15	CO1	Chalk and Talk, PPT
II	Domain Specific IoT: Introduction-Home Automation-Cities-Environment-Energy-Retail- Logistics-Agriculture-Industry-Health & Lifestyle. IoT and M2M: Introduction - M2M- Difference between IoT and M2M - SDN and NFV for IoT.	15	CO2	Chalk and Talk, PPT

III	M2M to IoT- An Architectural Overview: Building an Architecture-Main design principles and needed capabilities-An IoT Architecture Outline- Standard Considerations. M2M and IoT Technology Fundamentals: Devices and Gateways-Local and wide area Networking-Data Management.	15	CO3	Chalk and Talk, PPT
IV	IoT Architecture - Architecture Reference Model: Introduction-Reference Model and Architecture-IoT Reference Model: IoT Domain Model-Information Model-Functional Model-Communication Model-Safety, Privacy, Trust, Security Model IoT.	15	CO4	Chalk and Talk, PPT
V	Implementation Examples: The Smart Grid-Introduction-Smart Metering-Smart House-Smart energy city. Case Study: Commercial Building automation today and in the future.	15	CO5	Seminar, PPT presentation

**Course Designer**  
**Mrs.R.RajaSangeetha**



DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Core	23OPIT32	Software Project Management	4	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

### Course Objectives:

1. The primary objective is to define and highlight importance of software project management.
2. To understand the Project Planning and Creating the Work Breakdown Structure.
3. To differentiate the various Cost Estimation techniques and Effort Measures.
4. To become familiarize in formulating software management metrics & strategy in managing projects.
5. To build the Software Quality Assurance Plan and Software Configuration Management.

### Course Content:

UNIT	Course Content	No. of Hours	K Level	Course Objectives
I	Introduction to Competencies - Product Development Techniques - Management Skills - Product Development Life Cycle - Software Development Process and models - The SEI CMM - International Organization for Standardization.	15	Up to K4	CO1
II	Managing Domain Processes - Project Selection Models - Project Portfolio Management - Financial Processes - Selecting a Project Team - Goal and Scope of the Software Project -Project Planning - Creating the Work Breakdown Structure - Approaches to Building a WBS - Project Milestones - Work Packages - Building a WBS for Software.	15	Up to K4	CO2

III	Tasks and Activities - Software Size and Reuse Estimating - The SEI CMM - Problems and Risks - Cost Estimation - Effort Measures - COCOMO: A Regression Model - COCOMO II - SLIM: A Mathematical Model - Organizational Planning - Project Roles and Skills Needed.	15	Up to K4	CO3
IV	Project Management Resource Activities - Organizational Form and Structure - Software Development Dependencies - Brainstorming - Scheduling Fundamentals - PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar - Critical Chain Scheduling	15	Up to K5	CO4
V	Quality: Requirements – The SEI CMM - Guidelines - Challenges - Quality Function Deployment - Building the Software Quality Assurance - Plan - Software Configuration Management: Principles - Requirements - Planning and Organizing - Tools - Benefits - Legal Issues in Software - Case Study	15	Up to K5	CO5

**TEXT BOOK:**

Robert T. Futrell, Donald F. Shafer, Linda I. Safer, “Quality Software Project Management”, Pearson Education Asia 2002

**REFERENCE BOOK(S):**

1. Hughes, “*Software Project Management*”, Tata McGraw Hill 2004, 3rd Edition.
2. Kelkar.S.A., “*Software Project Management: A Concise Study*”, PHI.
3. Pankaj Jalote, “*Software Project Management in Practice*”, Addison Wesley 2002.
4. Richard H. Thayer.” *Software Engineering Project Management*”, 1997, IEEE Computer Society.
5. Shere K.D.: “*Software Engineering and Management*”, 1998, PHI.

**Websites and e-Learning resources**

1. <https://higher.ed.mheducation.com/sites/0077109899/information-center-view/>
2. [https://www.tutorialspoint.com/software\\_engineering/software\\_project\\_management.htm](https://www.tutorialspoint.com/software_engineering/software_project_management.htm)
3. <https://www.smartsheet.com/content/software-project-management>
4. [https://www.philadelphia.edu.jo/academics/lalqoran/uploads/SPM\\_Chapter\\_1-%202016%204.ppt](https://www.philadelphia.edu.jo/academics/lalqoran/uploads/SPM_Chapter_1-%202016%204.ppt)
5. <https://cs.gmu.edu/~kdobolyi/cs421/projectmanagement.ppt>

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

<b>COs</b>	<b>CLO Statement</b>	<b>Knowledge According to Bloom's Taxonomy (Upto K level)</b>
CO1	Understanding of project management fundamentals such as project planning, risk management and quality assurance	K1 to K4
CO2	Choose the appropriate scheduling and testing techniques to build a quality product	K1 to K4
CO3	Apply different cost estimation techniques and quality measures for software development	K1 to K4
CO4	Differentiate various software development models and methodologies, planning activities and scheduling methods	K1 to K5
CO5	Asses the importance of software project documentation and identify the methods to create project documentation, including requirements documents, design documents, and project plans	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>
<b>CLO1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CLO2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CLO3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CLO4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CLO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

**LESSON PLAN:**

<b>UNIT</b>	<b>Course Content</b>	<b>No. of Hours</b>	<b>Course Objectives</b>	<b>Mode of Teaching</b>
I	Introduction to Competencies - Product Development Techniques - Management Skills - Product Development Life Cycle - Software Development Process and models - The SEI CMM - International Organization for Standardization.	15	CO1	Chalk and Talk, PPT
II	Managing Domain Processes - Project Selection Models - Project Portfolio Management - Financial Processes - Selecting a Project Team - Goal and Scope of the Software Project -Project Planning - Creating the Work Breakdown Structure - Approaches to Building a WBS - Project Milestones - Work Packages - Building a WBS for Software.	15	CO2	Chalk and Talk, PPT
III	Tasks and Activities - Software Size and Reuse Estimating - The SEI CMM - Problems and Risks - Cost Estimation - Effort Measures - COCOMO: A Regression Model - COCOMO II - SLIM: A Mathematical Model - Organizational Planning - Project Roles and Skills Needed.	15	CO3	Chalk and Talk, PPT
IV	Project Management Resource Activities - Organizational Form and Structure - Software Development Dependencies - Brainstorming - Scheduling Fundamentals - PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar - Critical Chain Scheduling.	15	CO4	Chalk and Talk, PPT
V	Quality: Requirements – The SEI CMM - Guidelines - Challenges - Quality Function Deployment - Building the Software Quality	15	CO5	Seminar, PPT presentation

	Assurance - Plan - Software Configuration Management: Principles - Requirements - Planning and Organizing - Tools - Benefits - Legal Issues in Software - Case Study.			
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**Course Designer**  
**Mrs.S.Sumathi**

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Skill Enhancement Course	23OPITSEC3P	Office Automation and ICT Tools Lab	2	2	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

### Course Objectives:

1. To learn concepts of office automation and its importance in modern workplaces.
2. To gain the word processors, spreadsheets, presentation software, and database management systems.
3. To utilize communication tools such as email, instant messaging, and collaborative platforms to enhance workplace communication
4. Learn to manage and analyze data using office software tools
5. Implement automation tools to streamline repetitive tasks and improve efficiency.

### Course Content:

UNIT	Course Content	No. of Hours	K Level	Course Objectives
I	<b>Basics of computer</b> Introduction to Computer-Components of Computer-Concept of Hardware and Software-Data Representation-Concept of Data Processing-Application of Information Electronics and Communication Technology <b>Introduction to GUI based OS:</b> Introduction to various types of OS and its functions. 2. User Interface. 3. Various settings of GUI based OS. 4. File and Directory Management. 5. Various types of file extensions. 6. Common Utilities.	6	Up to K4	CO1
II	<b>Elements of Word Processing</b> Objective of Word Processing - Word Processing Basics-Opening and Closing -Basic Knowledge of Word-Processing, their usage, details of word processing screen Opening, saving and printing a document Documents. Text Creation and	6	Up to K4	CO2

	Manipulation- Formatting Text- Table Manipulation- Column and picture manipulation- Page Setup- Mail Merge			
III	Spread sheet -Objective of Spread sheet- Elements of Electronics –Spread sheet - Manipulation of Cells and worksheet -Function and Charts Presentation: Introduction and Objective - Basics of Power Point -Creation of presentation - Slides - Providing Aesthetics - Presentation of Slides -Slide Show .	6	Up to K4	CO3
IV	<b>Introduction to Network and Internet:</b> Introduction -Objective - Basics of Computer Networks -Concept and Basics of Internet Architecture -Preparing computer for Internet Access -World Wide Web. <b>Web Browser:</b> Introduction -Web Browsing Software - Configuring Web Browser - Search Engines. <b>Communication and Collaboration:</b> Introduction -Basics of E-mail -Using E-mails - Document Collaboration -Instant Messaging and Collaboration -Social Networking and E-commerce -Overview of eGovernance Services-Digital Locker	6	Up to K5	CO4
V	1. Create and Design Admission/Enquiry Forms etc. 2. Create bill/leaflets/brochures 3. Create Business Cards using Shapes, text, and colors. 4. Practice hyperlink and create links between word document texts to D: /, Play songs from Microsoft word text, create the link between internal and external files. 5. Create a chart and show the products prices comparison between 2016, 2017 and 2018.	6	Up to K5	CO5

	<p>6. Write an birthday invitation and send it to 50 invitees using mail merge option in MSWORD.</p> <p>7. Create the student marks list of 10 students and declare result using MSEXCEL.</p> <p>8. Create a power point presentation using about your college using images, tables etc. including animation and hyperlink option.</p>			
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**Text books:**

1. Libre Office, Getting Started Guide by Libre Office Documentation Team
2. Microsoft Office for Dummies by Wallace Wang
3. Mastering Office 2016 by Lalit Mali, Notion Press
4. Computer Networking by Tittel Ed, McGRaw Hills Companies

**REFERENCEBOOK(S):**

1. Microsoft Office for Dummies by Wallace Wang
2. OpenOffice.org for DUMMIES by GurdyLeete, Ellen Finkelstein and Mary Leete

**Websites and e-Learning resources**

- 1 <https://builtin.com/robotics>
- 2 <https://www.elprocus.com/robot-sensor/>
- 3 <https://sp-automation.co.uk/the-top-seven-types-of-robots/>
- 4 <https://robots.ieee.org/learn/types-of-robots/>
- 5 <https://www.intel.in/content/www/in/en/robotics/types-and-applications>

**Rationale for nature of Course:**

- **Knowledge and Skill:** These include a good understanding of Operating System
- **Activities to be given:** Create, test and deploy new, innovative website applications in a timely and efficient manner, while concurrently working with other developers to meet data acquisition requirements



**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	To define office automation and understand its benefits in improving efficiency and reducing manual workload	K1 to K4
CO2	To create, edit, and manage documents, spreadsheets, and presentations using software like Microsoft Office or Google Workspace	K1 to K4
CO3	To effectively use email clients, chat applications, and online meeting tools to communicate and collaborate with colleagues.	K1 to K4
CO4	Demonstrate the spreadsheets for data entry, analysis, and visualization, and databases for storing and retrieving information	K1 to K5
CO5	Analysis macros, templates, and other automation features to perform routine tasks quickly and accurately.	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	1	2	2	2
CO2	3	3	3	3	3	2
CO3	3	2	3	3	3	3
CO4	3	2	2	3	3	2
CO5	3	2	3	3	3	3

**LESSON PLAN:**

UNIT	Course Content	No. of Hours	Mode of Teaching
I	<p><b>Basics of computer</b> Introduction to Computer-Components of Computer-Concept of Hardware and Software-Data Representation-Concept of Data Processing-Application of Information Electronics and Communication Technology</p> <p><b>Introduction to GUI based OS:</b> Introduction to various types of OS and its functions. 2. User Interface. 3. Various settings of GUI based OS. 4.</p>	6	Chalk and Talk, PPT, quiz, on the spot test

	File and Directory Management. 5. Various types of file extensions. 6. Common Utilities.		
II	<b>Elements of Word Processing</b> Objective of Word Processing - Word Processing Basics- Opening and Closing -Basic Knowledge of Word-Processing, their usage, details of word processing screen Opening, saving and printing a document Documents. Text Creation and Manipulation- Formatting Text- Table Manipulation- Column and picture manipulation- Page Setup- Mail Merge	6	Chalk and Talk, PPT, quiz, on the spot test
III	Spread sheet -Objective of Spread sheet- Elements of Electronics –Spread sheet - Manipulation of Cells and worksheet -Function and Charts Presentation: Introduction and Objective - Basics of Power Point -Creation of presentation - Slides - Providing Aesthetics - Presentation of Slides -Slide Show .	6	Chalk and Talk, PPT, quiz, on the spot test
IV	<b>Introduction to Network and Internet:</b> Introduction -Objective - Basics of Computer Networks -Concept and Basics of Internet Architecture -Preparing computer for Internet Access -World Wide Web. <b>Web Browser:</b> Introduction -Web Browsing Software - Configuring Web Browser - Search Engines. <b>Communication and Collaboration:</b> Introduction -Basics of E-mail -Using E-mails - Document Collaboration -Instant Messaging and Collaboration -Social Networking and E-commerce -Overview of eGovernance Services-Digital Locker	6	Chalk and Talk, PPT, quiz, on the spot test
V	1. Create and Design Admission/Enquiry Forms etc. 2. Create bill/leaflets/brochures 3. Create Business Cards using Shapes, text, and colors.		Seminar, PPT ,

	<p>4. Practice hyperlink and create links between word document texts to D: /, Play songs from Microsoft word text, create the link between internal and external files.</p> <p>5. Create a chart and show the products prices comparison between 2016, 2017 and 2018.</p> <p>6. Write an birthday invitation and send it to 50 invitees using mail merge option in MSWORD.</p> <p>7. Create the student marks list of 10 students and declare result using MSEXCEL.</p> <p>8. Create a power point presentation using about your college using images, tables etc. including animation and hyperlink option.</p>	6	Group discussion
	<b>Total</b>	<b>30</b>	

**Course Designer**  
**Mrs.G.Amudha**

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
IV	Core	23OPIT41	.NET with C# Programming	5	6	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓	✓	

### Course Objectives:

1. To understand the basics structure of C# programming and the components of Active Server Pages.
2. To provide sufficient knowledge to work with SQL Server using Microsoft ADO.NET
3. To learn web Forms and their standard controls
4. To analysis the LINQ Queries and working with login controls
5. To gain the knowledge of ADO.NET Fundamentals

### Course Content:

UNIT	Course Content	No. of Hours	K Level	Course Objectives
I	<b>The C# Language :</b> Basics- Variables and Data Types - Variable Operations - Object Based Manipulation - Conditional logic - Loops - Methods - Types, Objects and Namespaces- Delegates.	18	Up to K4	CO1
II	<b>ASP.Net 4.5 Essentials:</b> Introduction to .NET: Benefits of .NET Framework - <b>Overview of .NET Framework 4.5 :</b> Common Language Runtime - Common Type System - Metadata and Assemblies- Introduction to visual studio 2012 IDE: Exploring Visual Studio 2012 IDE - <b>ASP.NET 4.5 Overview:</b> ASP.NET Life cycle: Life cycle of an ASP.Net web page- <b>Developing a Web Application:</b> File Types in ASP.NET 4.5- Exploring ASP.NET web pages - Understanding ASP.NET 4.5 Directives- <b>Application structure and State:</b> The Global.asax Application File- Using states: Application State- Session State- View State-Cookies- Postback and Cross-page posting.	18	Up to K4	CO2

III	Web Forms: Standard controls: Label control-Button Control-TextBox Control-Literal Control-PlaceHolder Control- HiddenField Control - Navigation controls: TreeView, Menu and SiteMapPath - Validation controls -Rich controls: Calendar Controls- AdRotator control.	18	Up to K4	CO3
IV	<b>LINQ Queries</b> : Standard Query operators: Filtering operators- Projection operators-Sorting operators- Grouping operators-set operators-Aggregate operators -Lambda Expressions - <b>Working with Login controls</b> : Login control- Password Recovery control - Create User Wizardcontrol-Change Password control	18	Up to K5	CO4
V	<b>ADO.NET Fundamentals</b> : Configuring your Database - ADO.NET Basics- Direct Data Access - Disconnected Data Access - <b>Data Binding</b> : Data Binding with ADO.NET- Data SourceControls - <b>The Data Controls</b> : The GridView - Formatting the GridView - Selecting a GridView Row- Editing, Sorting and Paging the GridView- Crystal Report	18	Up to K5	CO5

**Text Books:**

1. Kogent (2013), ASP.NET 4.5 Black Book –DreamtechPress,New Delhi (Unit 2,3,4)
2. Matthew MacDonald (2010), Beginning ASP.NET 4 in C#, Apress.(Unit 1,5)

**Reference Book(s)**

1. Greg Buczek(2002), ASP.NET Developer’s guide, Tata McGraw Hill Publications.
2. Jesse Liberty, (2002), Programming C#, 3.0, O’Reilly Press.
3. J.Sharp, (2009), Microsoft Visual C# 2008 Step by Step, PHI Learning Private Ltd.
4. Christian Nagel et al., (2007), Professional C# 2005 with .NET 3.0, Wiley India.
5. Herbert Schildt,(2010), C# 4.0 The Complete Reference, Tata McGraw Hill Publications

**Websites and e-Learning resources**

1. [www.homeandlearn.co.uk/csharp/csharp.html](http://www.homeandlearn.co.uk/csharp/csharp.html)
2. <http://msdn.microsoft.com/en-us/library//aa645596.aspx>
3. <http://www.csharpkey.com/csharp/>
4. <http://www.w3schools.com/aspnet/default.asp>
5. <http://www.maconstateit.net/tutorials/ASPNET20/default.htm>

**Knowledge and Skill:** To make students aware of the UML dynamic modeling, OOA process

**Activities to be given:** Students shall be asked to analyze upcoming or recent development in business object analysis

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	Outline the features of C# and ASP.NET concepts to understand the real time applications	K1 to K4
CO2	Identify the salient properties of C# programming concepts and ASP .NET Application	K1 to K4
CO3	List the various stages involved in creating a web form	K1 to K4
CO4	Select the appropriate web controls to develop the web forms	K1 to K5
CO5	Construct a database driven web applications with the facilitated web services.	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CO/PSO	PSO 1	PSO2	PSO3	PSO4	PSO5	PSO6
<b>CLO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CLO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>CLO3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>CLO4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CLO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

**LESSON PLAN**

UNIT	Course Content	No. of Hours	Course Objectives	Mode of Teaching
I	<b>The C# Language :</b> Basics- Variables and Data Types - Variable Operations - Object Based Manipulation - Conditional logic - Loops - Methods - Types, Objects and Namespaces- Delegates.	18	CO1	Chalk and Talk, PPT, quiz, on the spot test
II	<b>ASP.Net 4.5 Essentials:</b> Introduction to .NET: Benefits of .NET Framework - <b>Overview of .NET Framework 4.5 :</b> Common Language Runtime - Common Type System - Metadata and Assemblies-	18	CO2	Chalk and Talk, PPT, quiz, on the spot test

	Introduction to visual studio 2012 IDE: Exploring Visual Studio 2012 IDE - <b>ASP.NET 4.5 Overview:</b> ASP.NET Life cycle: Life cycle of an ASP.Net web page- <b>Developing a Web Application:</b> File Types in ASP.NET 4.5- Exploring ASP.NET web pages - Understanding ASP.NET 4.5 Directives- <b>Application structure and State:</b> The Global.asax Application File- Using states: Application State- Session State- View State-Cookies- Postback and Cross-page posting.			
III	Web Forms: Standard controls: Label control-Button Control-TextBox Control-Literal Control-PlaceHolder Control- HiddenField Control - Navigation controls: TreeView, Menu and SiteMapPath - Validation controls -Rich controls: Calendar Controls- AdRotator control.	18	CO3	Chalk and Talk, PPT, quiz, on the spot test
IV	<b>LINQ Queries :</b> Standard Query operators: Filtering operators- Projection operators-Sorting operators- Grouping operators-set operators-Aggregate operators -Lambda Expressions - <b>Working with Login controls:</b> Login control- Password Recovery control - Create User Wizardcontrol-Change Password control	18	CO4	Chalk and Talk, PPT, quiz, on the spot test
V	<b>ADO.NET Fundamentals:</b> Configuring your Database - ADO.NET Basics- Direct Data Access - Disconnected Data Access - <b>Data Binding :</b> Data Binding with ADO.NET- Data SourceControls - <b>The Data Controls :</b> The GridView - Formatting the GridView - Selecting a GridView Row- Editing, Sorting and Paging the GridView- Crystal Report	18	CO5	Seminar, PPT presentation.
	<b>Total</b>	<b>90</b>		

**Course Designer**  
**Mrs.R.Rajasangeetha**

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
IV	Core Lab	23OPIT4P	.NET with C# Programming-Lab	5	6	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓	✓	

**Course Objectives:**

1. To provide sufficient knowledge in developing web applications and to manipulate data from SQL Server using Microsoft ADO.NET
2. To apply Schema, ER-Model, normalization, transaction, concurrency and recovery on tables using SQL and PL/SQL.
3. To analyze and manage the distributional AdRotator Working with Validation controls
4. To access menu controls and Cookies
5. To design and construct tables and manipulate it effectively using Crystal Report

**Course Content:**

UNIT	Course Content	No. of Hours	K Level	Course Objectives
I	1. C# Basics 2. Delegates 3. Lambda Expressions	18	Up to K4	CO1
II	1. LINQ 2. Usage of Web Sever Controls	18	Up to K4	CO2
III	1. Usage of AdRotator, Calendar Controls 2. Working with Validation controls	18	Up to K4	CO3
IV	1. Menu Control 2. Cookies, View state, Session	18	Up to K5	CO4
V	1. Developing Database Applications using Data Grid 2. Creating Crystal Report	18	Up to K5	CO5

**Text Book:**

1. Kogent (2013), ASP.NET 4.5 Black Book –DreamtechPress, New Delhi

**Reference Books:**

1. Herbert Schildt, (2010), C# 4.0 The Complete Reference, Tata McGraw Hill Publications.



2. Abolrous S. A. (2008). “*Learn C# Includes the C# 3.0 Features*”. BPB Publications.
3. Chappell D. (2007). “*Understanding .NET*”. Pearson Education.
4. Kanetkar Y., Dani Asang. (2008). “*Test Your C# .Net Skills part I & II*”. BPB Publications.
5. Onion Fritz, Keith Brown. (2007). “*Essential ASP .NET 2.0*”. Pearson Education.

### Websites and e-Learning resources

1. <http://www.csharpkey.com/csharp/>
2. <http://www.w3schools.com/aspnet/default.asp><http://www.tutorialspoint.com/dbms/index.htm>
3. <http://www.codeproject.com>
4. <http://telerikacademy.com>
5. <https://msdn.microsoft.com>

### Rationale for nature of Course:

- **Knowledge and Skill:** To make students aware of relational databases and uses of PL/SQL.
- **Activities to be given:** Students shall be asked to design and construct tables and manipulate it effectively using PL/SQL database objects.

### COURSE OUTCOMES:

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	Demonstrate simple programs using C# programming concepts such as classes, objects, method overloading	K1 to K4
CO2	Solve complex programs using delegates, Lambda expression and LINQ	K1 to K4
CO3	Analyze the usage of web server controls, calendar controls, validation controls and menu controls in asp.net application	K1 to K4
CO4	Evaluate the role of Cookies, View state and Session state in creating an web Application	K1 to K5
CO5	Design a data driven web application by connecting to the data sources	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
<b>CLO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CLO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>
<b>CLO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>CLO4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>CLO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

**LESSON PLAN:**

UNIT	Course Content	No. of Hours	Mode of Teaching
I	1. C# Basics 2. Delegates 3. Lambda Expressions	18	Demo & Practical Session
II	1. LINQ 2. Usage of Web Sever Controls	18	Demo & Practical Session
III	1. Usage of AdRotator, Calendar Controls 2. Working with Validation controls	18	Demo & Practical Session
IV	1. Menu Control 2. Cookies, View state, Session	18	Demo & Practical Session
V	1. Developing Database Applications using Data Grid 2. 2.Creating Crystal Report	18	Demo & Practical Session
	<b>Total</b>	<b>90</b>	

**Course Designer**  
**Mrs.R.Boomadevi**

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
IV	Core	23OPITPR4	Project with Viva-voce	7	10	20	80	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓	✓	

### Course Objectives

1. The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
2. Each student should carry out individually one Project Work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea.

### Exam will be conducted as follows

- Viva-voce will be conducted at the end of IV semester.
- Both the Internal (Respective Guides) and External Examiners (20+80) should conduct the Viva-Voce Examination.
- For awarding a pass, a candidate should have obtained 50% of the Total 100 marks.

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
IV	Elective VI	23OPITDSE4A	Research Methodology	3	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

### Course Objectives:

1. To impart knowledge and skills required for research problem formulation, analysis, solutions, technical paper writing and drafting and filing patents.
2. To learn the fundamental concepts and ethical considerations in research.
3. To develop the ability to identify research problems and formulate research questions.
4. To understand various research designs and methodologies and select appropriate methods for different research problems.
5. To Learn about Scope of Patent Rights and Geographical Indications

### Course Content:

UNIT	Course Content	No. of Hours	K Level	Course Objectives
I	Research Methodology: Objectives and motivation of research - Types of research - Research approaches - Significance of research - Research methods verses methodology - Research and scientific method - Importance of research methodology - Research process - Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, necessary instrumentations- Criteria of good research. Defining the research problem: Definition of research problem - Problem formulation - Necessity of defining the problem - Technique involved in defining a problem.	15	Up to K4	CO1
II	Literature Survey and Data Collection: Importance of literature survey - Sources of information - Assessment of quality of journals and articles - Information through internet. Effective literature	15	Up to K4	CO2

	studies approaches, analysis, plagiarism, and research ethics. Data - Preparing, Exploring, examining and displaying.			
III	<b>Research Analysis and Design:</b> Meaning of research design - Need of research design - Different research designs - Basic principles of experimental design - Developing a research plan - Design of experimental set-up - Use of standards and codes. Overview of Multivariate analysis, Hypotheses testing and Measures of Association. Presenting Insights and findings using written reports and oral presentation.	15	Up to K4	CO3
IV	<b>Intellectual Property Rights: Nature of Intellectual Property: Patents, Designs, Trade and Copyright- Process of Patenting and Development: technological research, innovation, patenting, development- Role of WIPO and WTO in IPR establishments, Right of Property, Common rules of IPR practices, Types and Features of IPR Agreement, Trademark, Functions of UNESCO in IPR maintenance.</b>	15	Up to K5	CO4
V	<b>Patent Rights: Scope of Patent Rights- Licensing and transfer of technology- Patent information and databases- Geographical Indications -New Developments in IPR: Administration of Patent System, IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs -Licenses, Licensing of related patents, patent agents, Registration of patent agents.</b>	15	Up to K5	CO5

**Text Books:**

1. R. Ganesan, "Research Methodology for Engineers", MIP Publishers, Chennai, 2011.
2. Catherine J. Holland, "Intellectual property: Patents, Trademarks, Copyrights, Trade Secrets", Entrepreneur Press, 2007.

**Reference Books:**

1. Peter S. Menell ,Mark A. Lemley, Robert P. Merges, “Intellectual Property in the New Technological “Vol. I Perspectives, 2021.
2. Laura R. Ford, ”The Intellectual Property of Nations: Sociological and Historical Perspectives on a Modern Legal Institution “. Cambridge University,2006.
3. RatanKhananabis and SuvasisSaha, “Research Methodology”, Universities Press, Hyderabad, 2015.
4. David Hunt, Long Nguyen, Matthew Rodgers, “Patent searching: tools & techniques”, Wiley, 2007.
5. Ranjit Kumar, 2nd Edition, “Research Methodology: A Step by Step Guide for beginners” 2010

**Websites and e-Learning resources**

1. [https://www.wto.org/english/tratop\\_e/trips\\_e/intell\\_e.htm](https://www.wto.org/english/tratop_e/trips_e/intell_e.htm)
2. <https://www.isical.ac.in/~palash/research-methodology/RM-lec9.pdf>
3. [https://mrcet.com/downloads/digital\\_notes/CSE/Mtech/I%20Year/RESEARCH%20METHODOLOGY.pdf](https://mrcet.com/downloads/digital_notes/CSE/Mtech/I%20Year/RESEARCH%20METHODOLOGY.pdf)
4. <https://www.coursera.org/courses?query=research%20methodology>
5. <https://www.researchgate.net/topic/Research-Methodology>

**Rationale for nature of Course:**

- **Knowledge and Skill:** To Student to make the Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill.
- **Activities to be given:** Students to make architecture is the design and construction of buildings, combining art, mathematics, science and logistics. During an architecture degree, you will learn how to draw accurate designs of buildings either by hand or with computer software.

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom’s Taxonomy (Upto K level)
CO1	Understanding of research, IPR and patent fundamentals	K1 to K4
CO2	Identify the issues involved in research, IPR and patent filing	K1 to K4

<b>CO3</b>	Apply suitable instrumentation and sampling techniques for the research studies and recognize the framework for protecting IPR and process for obtaining patents	K1 to K4
<b>CO4</b>	Analyze data, and interpret research findings using appropriate methods and importance of IPR and patent protection in promoting research and development	K1 to K5
<b>CO5</b>	Design and develop research reports, research proposals, academic papers and patents	K1 to K5

### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
<b>CO1</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>

### LESSON PLAN

UNIT	Course Content	No. of Hours	Course Objectives	Mode of Teaching
I	Research Methodology: Objectives and motivation of research - Types of research - Research approaches - Significance of research - Research methods verses methodology - Research and scientific method - Importance of research methodology - Research process - Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, necessary instrumentations- Criteria of good research. Defining the research problem: Definition of research problem - Problem formulation - Necessity of defining the problem - Technique involved in defining a problem.	15	CO1	Chalk and Talk, PPT
II	Literature Survey and Data Collection: Importance of literature survey - Sources of information - Assessment of quality of journals and articles - Information through internet.	15	CO2	Chalk and Talk, PPT

	Effective literature studies approaches, analysis, plagiarism, and research ethics. Data - Preparing, Exploring, examining and displaying.			
III	<b>Research Analysis and Design:</b> Meaning of research design - Need of research design - Different research designs - Basic principles of experimental design - Developing a research plan - Design of experimental set-up - Use of standards and codes. Overview of Multivariate analysis, Hypotheses testing and Measures of Association. Presenting Insights and findings using written reports and oral presentation.	15	CO3	Chalk and Talk, PPT
IV	<b>Intellectual Property Rights: Nature of Intellectual Property: Patents, Designs, Trade and Copyright- Process of Patenting and Development: technological research, innovation, patenting, development- Role of WIPO and WTO in IPR establishments, Right of Property, Common rules of IPR practices, Types and Features of IPR Agreement, Trademark, Functions of UNESCO in IPR maintenance.</b>	15	CO4	Chalk and Talk, PPT
V	<b>Patent Rights: Scope of Patent Rights- Licensing and transfer of technology- Patent information and databases- Geographical Indications -New Developments in IPR: Administration of Patent System, IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs -Licenses, Licensing of related patents, patent agents, Registration of patent agents.</b>	15	CO5	Seminar, PPT presentation
	<b>Total</b>	<b>75</b>		

**Course Designer**  
**Mrs.R.Lakshmi**



DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
IV	Elective VI	23OPITDSE4B	Trends in Computing	3	5	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓	✓	

### Course Objectives:

1. To understand the concepts and infrastructure of cloud computing and its business applications.
2. To understand the scope, design and model of grid computing
3. Knowledge about the of Information Technology systems.
4. Analyze the migrations and security concerns of cloud, different grid models, and resources.
5. Assess the business cases of cloud, and also various laws, approaches and protocols for regulating green IT.

### Course Content:

UNIT	Course Content	No. of Hours	K Level	Course Objectives
I	<b>Cloud Computing:</b> Basics: Overview – Applications – Intranets and the Cloud – First Movers in the Cloud – Organization and Cloud Computing: Benefits – Limitations – Security Concerns- The Business Case for Going to the Cloud: Cloud Computing Services -Deleting Datacenter.	15	Up to K4	CO1
II	Hardware and Infrastructure: Clients – Security – Network –Services- Accessing the Cloud: Platforms - Cloud Storage: Overview – Cloud Storage Providers.	15	Up to K4	CO2
III	Developing Applications: Google – Microsoft - Local Cloud and Thin Clients: Virtualization – Server Solutions – Thin Clients – Migrating to the Cloud.	15	Up to K4	CO3
IV	<b>Grid Computing:</b> Introduction - Benefits – Grid Terms and Concepts: Types of Resources – Jobs and Applications –	15		CO4

	Scheduling, Reservation and Scavenging – Grid Software Components – Grid user role: User Perspective – Administrator Perspective - Design: Building grid architecture - Models – Topologies – Phases and Activities.		Up to K5	
V	<b>Green Computing:</b> Introduction - History of Green Computing - Regulations and Industry Initiative - The Demons behind Green Computing - Approaches to Green Computing - Role of IT vendors - Green Computing Tips - Future is Green.	15	Up to K5	CO5

**TEXTBOOK(S):**

1. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, "Cloud Computing - A practical Approach", McGraw Hill, 2010.
2. Bart Jacob, Michael Brown, Kentaro Fukui, and Nihar Trivedi, "Introduction to Grid Computing", IBM Redbook, 2005.

**REFERENCE BOOK(S):**

1. George Reese, "Cloud Application Architectures: Building Applications and Infrastructures in the cloud", O'Reilly Media Inc., 2009.
2. Halper Fern, Kaufman Marcia, Bloor Robin, Hurwit Judith, "Cloud Computing for Dummies", Wiley India Pvt Ltd, 2009.
3. J. Velete, Anthony T. Velete, Robert Elsenpeter, "Green IT – Reduce Your Information System's Environmental Impact While Adding to the Bottom Line", McGraw-Hill, 2008.
4. Bud E. Smith, "Green Computing: Tools and Techniques for Saving Energy, Money, and Resources", Auerbach Publications, 2013.

**Websites and e-Learning resources**

1. [http://www.siteground.com/tutorials/cloud/cloud\\_computing\\_infrastructure.htm](http://www.siteground.com/tutorials/cloud/cloud_computing_infrastructure.htm)
2. <http://thecloudtutorial.com/>
3. <http://studymafia.org/wp-content/uploads/2015/11/CSE-Green-Computing-Report.pdf>
4. [http://www.znu.ac.ir/data/members/dastjerdi\\_mohammad/Book11.pdf](http://www.znu.ac.ir/data/members/dastjerdi_mohammad/Book11.pdf) (Unit IV)
5. <http://www.cs.kent.edu/~farrell/grid06/lectures/grid01.pdf> (Unit V)

**Rationale for nature of Course:**

- **Knowledge and Skill:** These include a good understanding of Digital Image Processing.

- **Activities to be given:** Create, test and deploy new image techniques in a timely and efficient manner, while concurrently working with others to meet data acquisition requirements.

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	Outline the history, applications, benefits and limitations of Cloud, Grid and Green computing	K1 to K4
CO2	Describe the cloud infrastructure services, virtualization and determine how applications can be developed using cloud services	K1 to K4
CO3	Identify cloud storage providers, software components of grid, technologies applied in building a green system and various key sustainability in Green IT Trends	K1 to K4
CO4	Analyse the migrations and security concerns of cloud, different grid models, resources and also identify how the distributed computing environments can be built from lower level services	K1 to K5
CO5	Assess the business cases of cloud, and also various laws, approaches and protocols for regulating green IT.	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	2	2
CO2	3	3	3	3	2	2
CO3	3	2	3	3	3	3
CO4	3	2	2	3	3	2
CO5	3	2	3	3	3	2

**LESSON PLAN:**

UNIT	Course Content	No. of Hours	Course Objectives	Mode of Teaching
I	<b>Cloud Computing:</b> Basics: Overview – Applications – Intranets and the Cloud – First	15	CO1	Chalk and Talk, PPT,

	Movers in the Cloud – Organization and Cloud Computing: Benefits – Limitations – Security Concerns- The Business Case for Going to the Cloud: Cloud Computing Services -Deleting Datacenter.			quiz, on the spot test
II	Hardware and Infrastructure: Clients – Security – Network –Services- Accessing the Cloud: Platforms - Cloud Storage: Overview – Cloud Storage Providers.	15	CO2	Chalk and Talk, PPT, quiz, on the spot test
III	Developing Applications: Google – Microsoft - Local Cloud and Thin Clients: Virtualization – Server Solutions – Thin Clients – Migrating to the Cloud.	15	CO3	Chalk and Talk, PPT, quiz, on the spot test
IV	<b>Grid Computing:</b> Introduction - Benefits – Grid Terms and Concepts: Types of Resources – Jobs and Applications – Scheduling, Reservation and Scavenging – Grid Software Components – Grid user role: User Perspective – Administrator Perspective - Design: Building grid architecture - Models – Topologies – Phases and Activities.	15	CO4	Chalk and Talk, PPT, quiz, on the spot test
V	<b>Green Computing:</b> Introduction - History of Green Computing - Regulations and Industry Initiative - The Demons behind Green Computing - Approaches to Green Computing - Role of IT vendors - Green Computing Tips - Future is Green.	15	CO5	Seminar, PPT , Group discussion
	<b>Total</b>	<b>75</b>		

**Course Designer  
Mrs.G.Amudha**

DEPARTMENT OF INFORMATION TECHNOLOGY					Class: II M.Sc.			
Sem.	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
IV	Skill Enhancement Course	23OPITSEC4P	React JS Lab	2	3	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓	✓	

**Course Objectives:**

1. To Create a basic web page using HTML & CSS.
2. To Understand JSX and React JS Environment Setups.
3. To analyze a Real-Time Application by Using React JS.
4. To develop skills on Routing in React JS and Design JS Forms.
5. To Write Styles in React JS and React Router with Navigation.

**Course Content:**

UNIT	Details	No. of Hours	K Level	Course Objectives
I	1. Basic web page using HTML & CSS 2. NPM Installation by locally and Globally 3. Create a Basic App with React JS and other Supported NPM 4. Create a Small React Module	9	Upto K4	CO1
II	5. Use All the states in the created Application. 6. Create a React Form. 7. Client-side form validation.	9	Upto K4	CO2
III	8. Applying form components. 9. Submit and Rest the form. 10. Applying Different Life cycles in the Application.	9	Upto K4	CO3
IV	11. When to choose Appropriate life cycles. 12. Create a Single Page Application. 13. Applying Routing.	9	Upto K5	CO4

V	14. Dynamically render the components based on the URL. 15. Communicate Data between components. 16. Applying all lists of events.	9	Upto K5	CO5
	<b>Total</b>	<b>45</b>		

**Text Book:**

Maximilian Schwarzmuller. (2022). *React Key Concepts*. Packt Publishing. Mumbai.India.

**Reference Books:**

1. Bryan Basham, Kathy Sierra and Bert Bates. (2008). *Head First Servlets and JSP*. O'Reilly Media. 2<sup>nd</sup> Edition.
2. Jeremy Osborn, Jennifer Smith & the AGI Training Team. (2011). *Web Design with HTML and CSS*. Wiley Publishing Inc. Indianapolis. Indiana.
3. Jennifer Niederst Robbins. (2012). *Learning web designing A Beginners guide to / HTML,CSS, Java script and Web graphics*. O'reilly Publications. New Delhi. Fourth Edition.
4. Mariza Maini. (2015). *WEB DESIGN Manual*. Open Society for Idea Exchange. Zagreb.
5. Robin Wieruch. (2018). *The Road to React*. Independently published.

**Websites and e-Learning resources**

1. <https://legacy.reactjs.org/docs/getting-started.html>
2. [https://pubhtml5.com/kcvf/cnor/React\\_Lab\\_Manual/](https://pubhtml5.com/kcvf/cnor/React_Lab_Manual/)
3. <https://www.collegesidekick.com/study-docs/1167624>

**Rationale for nature of Course:**

- **Knowledge and Skill:** To make students developing well-designed, efficient, and testable code. Conducting software analysis, programming, testing, and debugging using React JS.
- **Activities to be given:** Student to be designing, building and maintaining application in React-JS.

**COURSE OUTCOMES:**

At the end of the course, the student will be able to:

COs	CLO Statement	Knowledge According to Bloom's Taxonomy (Upto K level)
CO1	Understand and create basic web page using HTML & CSS.	K1 to K4
CO2	Demonstrate the setup and configuration of JSX and React JS Environment.	K1 to K4
CO3	Apply the necessary UI components with Real-Time Application by using React J.	K1 to K4
CO4	Examine and implement the required Routing in React JS and Design JS Forms.	K1 to K5
CO5	Test and debug the various Styles in React JS and React Router with Navigation.	K1 to K5

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	3
CO2	3	3	3	2	3	3
CO3	3	3	2	2	3	3
CO4	3	3	3	3	3	3
CO5	3	3	2	2	3	3

**LESSON PLAN:**

UNIT	Details	No. of Hours	Mode of Teaching
I	1. Basic web page using HTML & CSS 2. NPM Installation by locally and Globally 3. Create a Basic App with React JS and other Supported NPM 4. Create a Small React Module	9	Demo & Practical Session
II	5. Use All the states in the created Application. 6. Create a React Form. 7. Client-side form validation.	9	Demo & Practical Session
III	8. Applying form components. 9. Submit and Rest the form. 10. Applying Different Life cycles in the Application.	9	Demo & Practical Session

IV	11. When to choose Appropriate life cycles. 12. Create a Single Page Application. 13. Applying Routing.	9	Demo & Practical Session
V	14. Dynamically render the components based on the URL. 15. Communicate Data between components. 16. Applying all lists of events.	9	Demo & Practical Session
	<b>Total</b>	<b>45</b>	

**Course Designer**  
**Mrs.S.Sumathi**



**EVALUATION (PRACTICAL)**

<b>Internal</b> (Formative)	: 40 marks
<b>External</b> (Summative)	: 60 marks
<b>Total</b>	: 100 marks

**Question Paper Pattern for Internal Practical Examination: 40 Marks**

<b>S.No</b>	<b>Components</b>	<b>Marks</b>
1.	Major Question	20
2.	Minor Question	10
3.	Record Work	5
4.	Program Explanation / VIVA	5
	<b>Total</b>	<b>40</b>

**Question Paper Pattern for External Practical Examination (Major) : 60 Marks**

<b>S.No</b>	<b>Components</b>	<b>Marks</b>
1.	Major Question	30
2.	Minor Question	20
3.	Record Work	5
4.	Program Explanation / VIVA	5
	<b>Total</b>	<b>60</b>

In respect of external examinations passing minimum is **45%** for Post Graduate Courses and in total, aggregate of **50%**.

Latest amendments and revisions as per **UGC** and **TANSICHE** norm is taken into consideration to suit the changing trends in the curriculum.