

**D.K.M. COLLEGE FOR WOMEN  
(AUTONOMOUS)**

**VELLORE-1**

**(REACCREDITED BY NAAC WITH 'A' GRADE)**

**DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS**

**UG-B.Sc ARTIFICIAL INTELLIGENCE DEGREE**



**TEMPLATE AND SYLLABUS**

**2024-2025**

# 1. Introduction

## **B.Sc. Artificial Intelligence**

Artificial Intelligence or AI, is a branch of computer science that deals with building smart machines that are capable of performing complex tasks that normally require human interference and intelligence. It combines Data Science with real-life data to leverage machines and computers to imitate the decision-making and problem-solving capabilities that the human mind has. Many human mental activities such as writing computer programs, doing mathematics, engaging in common sense reasoning, understanding language, and even driving an automobile are said to demand “intelligence.” Most of the work on building such kinds of systems has taken place in the field called “Artificial Intelligence (AI).” This work has had an experimental and designing direction to a great extent. Drawing from a loosely structured but growing body of computational techniques, AI systems are developed, undergo experimentation, and are improved. This interaction has created and refined a few general AI standards of wide pertinence.

The course is enabled to include several interdisciplinary areas like: Machine Learning, Deep Learning, Natural Language Processing, Robotics, Artificial Intelligence in Business and Society and The Future of Artificial Intelligence, operating systems, databases, business intelligence, big data, probability and statistics, data optimization, statistical simulation and data analysis, management decision analysis, decision models and predictive analysis. Artificial Intelligence has gained paramount importance in the computer science domain. The need for scientists who understand data in all its aspects will continue to grow strongly. Students graduating from the program will have significantly more depth and breadth in the broad area of Data Science and receive all the information they need to work with various kinds of data and statistical data. The program is designed so that students have in-depth knowledge of the many approaches, aptitudes, methodologies, and instruments needed to deal with corporate data. Students receive instruction in the abilities needed to find the needed solutions and assist in making significant judgments.

AI is a vast field in itself. Not only does it covers an extensive range of topics, but it also has a lot of depth as the AI algorithms use a lot of advanced mathematics. Thus, the eligibility for an AI course can depend on the nature of the course. However, if the course is not getting into extreme levels of depth (regarding the exact functioning of various AI algorithms), then the typical eligibility would be working knowledge of analytics tools especially Python for Data Science, while candidates from different educational backgrounds can take up artificial intelligence courses, having knowledge of mathematical concepts such as Calculus can give one a slight edge in understanding the mathematical functioning of the algorithms, Knowledge of basic Data Science is required which includes data manipulation and statistical modelling.

## **B.SC. ARTIFICIAL INTELLIGENCE**

### **Programme Educational Objectives (PEOs)**

#### **PEO1: Attain Academic and Professional Excellence**

Build a strong academic foundation and skill set that will enable success in higher education, competitive examinations, teaching, research, industry, and entrepreneurial ventures.

#### **PEO2: Emerge as Empowered Individuals**

Develop into confident, self-reliant, and economically independent women capable of applying scientific knowledge to enhance personal growth, family welfare, and community development.

#### **PEO3: Advance Research and Innovation**

Demonstrate the ability to investigate real-world challenges and contribute contextually relevant, research-driven, and innovative solutions across scientific disciplines.

#### **PEO4: Uphold Ethical and Cultural Values**

Adhere to high ethical standards, respect cultural diversity, and engage responsibly in scientific practices that contribute to a just and inclusive society.

#### **PEO5: Respond to Societal and National Needs**

Utilize scientific understanding to support public health, environmental conservation, and technological advancement, fostering inclusive regional and national progress.

#### **PEO6: Exhibit Leadership and Social Responsibility**

Lead scientific and community initiatives with integrity, inspire collaborative action, and actively contribute to positive social transformation at local and global levels.

#### **PEO7: Engage in Lifelong and Global Learning**

Pursue continuous personal and professional development while staying abreast of global trends, innovations, and interdisciplinary scientific advancements.

## **Programme Outcomes (POs)**

### **PO1: Comprehend and Apply Scientific Knowledge**

Acquire and apply core knowledge from scientific disciplines to understand natural phenomena, solve complex problems, and support innovation across various domains of life and industry.

### **PO2: Demonstrate Analytical and Critical Thinking**

Develop the ability to think critically and analytically by formulating hypotheses, interpreting experimental results, evaluating scientific literature, and drawing evidence-based conclusions.

### **PO3: Exhibit Technical and Laboratory Competency**

Gain proficiency in laboratory techniques, handling of scientific instruments, and use of software tools, while adhering to safety protocols, accuracy, and reproducibility in experimental work.

### **PO4: Communicate Effectively**

Present scientific concepts and findings clearly and coherently through oral presentations, technical writing, and the use of digital tools, adapting to both academic and professional contexts.

### **PO5: Uphold Ethical Values and Environmental Consciousness**

Integrate ethical principles and environmental awareness into scientific practices, promoting sustainable solutions and a sense of accountability towards society and nature.

### **PO6: Engage in Lifelong Learning**

Cultivate an inquisitive mindset and adaptability to emerging scientific advancements, technologies, and interdisciplinary approaches, thereby remaining relevant and competent throughout life.

### **PO7: Collaborate and Lead in Scientific and Social Contexts**

Participate effectively in collaborative scientific projects and community-based activities, demonstrating leadership, decision-making, and commitment to women's empowerment and societal progress.

□ Programme Specific Outcomes – B.Sc. Artificial Intelligence

**PSO1: Understand Theoretical and Practical Aspects of AI**

Apply foundational concepts in AI, machine learning, deep learning, and cognitive computing to model intelligent systems.

**PSO2: Build and Deploy Intelligent Applications**

Design AI-powered solutions such as recommendation systems, chatbots, and intelligent agents across industries.

**PSO3: Work with Real-World Data**

Preprocess, visualize, and analyze structured and unstructured datasets using programming languages and AI libraries.

**PSO4: Address Ethical and Human-Centric AI Concerns**

Evaluate AI models for fairness, accountability, transparency, and ethical deployment in society.

**PSO5: Be Industry and Research Ready**

Prepare for advanced roles in AI development, data science, research labs, or academic progression to postgraduate AI studies.

**PSO6: Use AI for Social Upliftment and Smart Governance**

Design intelligent tools for rural development, education access, public health prediction, and women's digital inclusion.

**PSO7: Stay Current with AI Frontiers**

Continuously engage with advancements in neural networks, robotics, vision systems, and interdisciplinary AI applications.

---

**Choice Based Credit System (CBCS), Learning Outcomes Based Curriculum Framework  
(LOCF) Guideline Based Credit and Hours Distribution System  
B.Sc. Artificial Intelligence Curriculum Design**

**First Year**

**Semester-I**

<b>Part</b>	<b>List of Courses</b>	<b>Credit</b>	<b>Hours per week (L/T/P)</b>	<b>CIA</b>	<b>Uni. Exam</b>	<b>Total</b>
Part-I	Language – Tamil	3	6	25	75	100
Part-II	English	3	6	25	75	100
Part-III	CC1 - Python Programming	5	5	25	75	100
	CC2 - Practical : Python Programming Lab	5	5	25	75	100
	Elective Course - EC1 1. Numerical Methods – I 2. Discrete Mathematics - I	3	4	25	75	100
Part-IV	Skill Enhancement Course- SEC-1 (Non Major Elective)- Fundamentals of Information Technology	2	2	25	75	100
	Foundation Course FC - Problem Solving Techniques	2	2	25	75	100
		<b>23</b>	<b>30</b>	<b>175</b>	<b>525</b>	<b>700</b>

**Semester-II**

<b>Part</b>	<b>List of Courses</b>	<b>Credit</b>	<b>Hours per week(L/T/P)</b>	<b>CIA</b>	<b>Uni. Exam</b>	<b>Total</b>
Part-I	Language -Tamil	3	6	25	75	100
Part-II	English	3	6	25	75	100
Part-III	CC3 - Data Structure and Algorithms	5	5	25	75	100
	CC4 - Practical: Data Structure and Algorithms Lab	5	5	25	75	100
	Elective Course - EC2 1. Numerical Methods – II 2. Discrete Mathematics - II	3	4	25	75	100
Part-IV	Skill Enhancement Course- SEC-2 (Non Major Elective) – Office Automation	2	2	25	75	100
	Skill Enhancement Course – SEC-3 Introduction to HTML	2	2	25	75	100
		<b>23</b>	<b>30</b>	<b>175</b>	<b>525</b>	<b>700</b>

**Second Year**

### Semester-III

Part	List of Courses	Credit	Hours per week(L/T/P)	CIA	Uni. Exam	Total
Part-I	Language - Tamil	3	6	25	75	100
Part-II	English	3	6	25	75	100
Part-III	CC5- Tensor Flow	5	5	25	75	100
	CC6 - Practical: Tensor Flow Lab	5	5	25	75	100
	Elective Course – EC3 1. Operation Research 2. Mathematical Statistics - I	3	4	25	75	100
Part-IV	Skill Enhancement Course -SEC-4 (Entrepreneurial Based) – Understanding Internet	1	1	25	75	100
	Skill Enhancement Course -SEC-5 – Multimedia Systems	2	2	25	75	100
	Environmental Studies	-	1	-	-	-
		<b>22</b>	<b>30</b>	<b>175</b>	<b>525</b>	<b>700</b>

### Semester-IV

Part	List of Courses	Credit	Hours per week (L/T/P)	CIA	Uni. Exam	Total
Part-I	Language - Tamil	3	6	25	75	100
Part-II	English	3	6	25	75	100
Part-III	CC7 – Object Oriented Programming with Java	5	5	25	75	100
	CC8 - Practical: Object Oriented Programming with Java Lab	5	5	25	75	100
	Elective Course - EC4 1. Introduction to Linear algebra. 2. Mathematical Statistics - II	3	3	25	75	100
Part-IV	Skill Enhancement Course – SEC-6 - Quantitative Aptitude	2	2	25	75	100
	Skill Enhancement Course - SEC-7 – PHP Programming	2	2	25	75	100
	Environmental Studies	2	1	25	75	100
		<b>25</b>	<b>30</b>	<b>200</b>	<b>600</b>	<b>800</b>

### Third Year Semester-V

Part	List of Courses	Credit	Hours per week (L/T/P)	CIA	Uni. Exam	Total
Part-III	CC9 - Relational Database Management System	4	5	25	75	100
	CC10 - Machine Learning	4	5	25	75	100
	CC11 - Practical: RDBMS Lab using ORACLE	4	5	25	75	100
	Elective Course – EC5 1. Operating System 2. Computing Intelligence	3	4	25	75	100
	Elective Course – EC6 1. Computer Networks 2. Information Security	3	4	25	75	100
	CC12 - Core /Project with Viva voce	4	5	25	75	100
Part-IV	Value Education	2	2	25	75	100
	Internship / Industrial Training (Summer vacation at the end of IV semester activity)	2		25	75	100
		<b>26</b>	<b>30</b>	<b>200</b>	<b>600</b>	<b>800</b>

#### Semester-VI

Part	List of Courses	Credit	Hours per week (L/T/P)	CIA	Uni. Exam	Total
Part-III	CC13 - IoT and Cloud Technologies	4	6	25	75	100
	CC14 - . Artificial Intelligence	4	6	25	75	100
	CC15 - Practical: . IoT and Cloud Technologies Lab	4	6	25	75	100
	Elective Course – EC7 1. Software engineering 2. Cryptography	3	5	25	75	100
	Elective Course – EC8 1. Big Data Analytics 2. Grid Computing	3	5	25	75	100
Part-IV	Professional Competency Skill Enhancement Course SEC8	2	2	25	75	100
Part -V	Extension Activity	1	-	-	-	100
		<b>21</b>	<b>30</b>	<b>150</b>	<b>450</b>	<b>700</b>

**Total Credits: 140**

**TOTAL CREDITS**

**B.Sc ARTIFICIAL INTELLIGENCE**

Part	Subject	Papers	Credit	Total credits	Marks	Total Marks
I	Language	4	3	12	100	400
II	English	4	3	12	100	400
III	Elective EC	8	3	24	100	800
III	Core theory	8	4x5=20 4x4=16	36	100	800
	Core Practicals	6	4x5=20 2x4=08	28	100	600
III	Project	1	4	4	100	100
IV	EVS	1	2	2	100	100
IV	VE	1	2	2	100	100
IV	Skill Enhancement Course	7	6x2=12 1x1=1	13	100	700
IV	Foundation Course	1	2	2	100	100
IV	Professional Competency Skill	1	2	2	100	100
IV	Internship	1	1	2	100	100
V	Extension activity	1	1	1	100	100
<b>Total</b>				<b>140</b>		<b>4400</b>

## SEMESTER – I

### Python Programming

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
CC1	PYTHON PROGRAMMING		5	-	-	-	5	25	75	100
<b>Course Objectives</b>										
CO1	To make students understand the concepts of Python programming.									
CO2	To apply the OOPs concept in PYTHON programming.									
CO3	To impart knowledge on demand and supply concepts									
CO4	To make the students learn best practices in PYTHON programming									
CO5	To know the costs and profit maximization									
UNIT	Contents									No. of Hours
I	<b>Basics of Python Programming:</b> History of Python-Features of Python-Literal-Constants-Variables-Identifiers–Keywords-Built-in Data Types-Output Statements –Input Statements-Comments –Indentation- Operators - Expressions- Type Conversions <b>Python Arrays:</b> Defining and Processing Arrays – Array methods.									15
II	<b>Control Statements:</b> Selection/Conditional Branching statements: if,if-else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. <b>Jump Statements:</b> break, continue and pass statements.									15
III	<b>Functions:</b> Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. <b>Function Arguments:</b> Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments-Recursion. <b>Python Strings:</b> String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. <b>Modules:</b> import statement- The Python module – dir() function –									15

	Modules and Namespace–Defining our own modules.	
IV	<b>Lists:</b> Creating a list-Access values in List-Updating values in Lists-Nested lists-Basic list operations-List Methods. <b>Tuples:</b> Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples–Difference between lists and tuples. <b>Dictionaries:</b> Creating, Accessing, Updating and Deleting Elements in a Dictionary–Dictionary Functions And Methods-Difference between Lists and Dictionaries.	<b>15</b>
V	<b>Python File Handling:</b> Types of files in Python -Opening and Closing files-Reading and Writing files: write() and write lines() methods- append()method–read()and readlines() methods–with keyword–Splitting words –File methods-File Positions-Renaming and deleting files.	<b>15</b>
<b>TOTAL HOURS</b>		<b>75</b>
<b>Course Outcomes</b>		<b>Programme Outcomes</b>
CO	On completion of this course, students will	
CO1	Learn the basics of python, Do simple programs on python, Learn how to use an array.	PO1,PO2,PO3, PO4,PO5,PO6
CO2	Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements.	PO1,PO2,PO3, PO4,PO5,PO6
CO3	Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.	PO1,PO2,PO3, PO4,PO5,PO6
CO4	Work with List, tuples and dictionary, Write program using list, Tuples and dictionary.	PO1,PO2,PO3, PO4,PO5,PO6
CO5	Usage of File handlings in python, Concept of reading and writing files, Do programs using files.	PO1,PO2,PO3, PO4,PO5,PO6
<b>Text books</b>		
1	Reema Thareja,–Python Programming using problem solving approach,,First Edition, 2017,Oxford University Press.	
2	Dr. R. Nageswara Rao –Core Python Programming ,,First Edition,2017,Dreamtech Publishers.	
<b>Reference Books</b>		
1.	Vamsi Kurama,–Python Programming: A Modern Approach,, Pearson Education.	
2.	Mark Lutz,, Learning Python ,,Orielly.	
3.	Adam Stewarts,–Python Programming ,, Online.	
4.	Fabio Nelli,–Python Data Analytics ,,A Press.	

5.	Kenneth A Lambert,-Fundamentals of Python-First Programs II,CENGAGE Publication.
<b>Web Resources</b>	
1.	<a href="https://www.programiz.com/python-programming">https://www.programiz.com/python-programming</a>
2.	<a href="https://www.guru99.com/python-tutorials.html">https://www.guru99.com/python-tutorials.html</a>
3.	<a href="https://www.w3schools.com/python/python_intro.asp">https://www.w3schools.com/python/python_intro.asp</a>
4.	<a href="https://www.geeksforgeeks.org/python-programming-language/">https://www.geeksforgeeks.org/python-programming-language/</a>
5.	<a href="https://en.wikipedia.org/wiki/Python_(programming_language)">https://en.wikipedia.org/wiki/Python_(programming_language)</a>

**Mapping with Programme Outcomes:**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	3	3
CO2	3	2	2	3	2	3
CO3	3	2	2	3	2	2
CO4	3	2	2	3	2	3
CO5	3	2	2	3	3	3
<b>Weightage of course contributed to each PSO</b>	15	10	10	15	13	14

S-Strong-3    M-Medium-2    L-Low-1

## Python Programming Lab

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
CC2	PYTHON PROGRAMMING LAB		-	-	5	-	5	25	75	100
<b>Course Objectives:</b> <ol style="list-style-type: none"> <li>1. Be able to design and program Python applications.</li> <li>2. Be able to create loops and decision statements in Python.</li> <li>3. Be able to work with functions and pass arguments in Python.</li> <li>4. Be able to build and package Python modules for reusability.</li> <li>5. Be able to read and write files in Python.</li> </ol>										
<b>LAB EXERCISES</b>								<b>Required Hours</b>		
<ol style="list-style-type: none"> <li>1. Program using variables, constants, I/O statements in Python.</li> <li>2. Program using Operators in Python.</li> <li>3. Program using Conditional Statements.</li> <li>4. Program using Loops.</li> <li>5. Program using Jump Statements.</li> <li>6. Program using Functions.</li> <li>7. Program using Recursion.</li> <li>8. Program using Arrays.</li> <li>9. Program using Strings.</li> <li>10. Program using Modules.</li> <li>11. Program using Lists.</li> <li>12. Program using Tuples.</li> <li>13. Program using Dictionaries.</li> <li>14. Program for File Handling.</li> </ol>								<b>75</b>		
<b>Course Outcomes</b>										
On completion of this course, students will										
CO1	Demonstrate the understanding of syntax and semantics of									
CO2	Identify the problem and solve using PYTHON programming techniques.									
CO3	Identify suitable programming constructs for problem solving.									
CO4	Analyze various concepts of PYTHON language to solve the problem in an efficient way.									
CO5	Develop a PYTHON program for a given problem and test for its correctness.									

**Mapping with Programme Outcomes:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>
<b>CO1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>
<b>CO2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>-</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>CO4</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>1</b>
<b>CO5</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>-</b>
<b>Weightage of course contributed to each PSO</b>	<b>12</b>	<b>11</b>	<b>12</b>	<b>7</b>	<b>5</b>	<b>7</b>

**S-Strong-3 M-Medium-2 L-Low-1**

## Fundamentals of Information Technology

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
	<b>FUNDAMENTALS OF INFORMATION TECHNOLOGY</b>	<b>SEC –I NME</b>	2	-	-	-	2	25	75	100
<b>Learning Objectives</b>										
<b>CO1</b>	Understand basic concepts and terminology of information technology.									
<b>CO2</b>	Have a basic understanding of personal computers and their operation									
<b>CO3</b>	Be able to identify data storage and its usage									
<b>CO4</b>	Get great knowledge of software and its functionalities									
<b>CO5</b>	Understand about operating system and their uses									
<b>UNIT</b>	<b>Contents</b>									<b>No. Of. Hours</b>
I	<b>Introduction to Computers:</b> Introduction, Definition, .Characteristics of computer, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification Of Computers, Applications of Computer, Capabilities and limitations of computer									<b>6</b>
II	<b>Basic Computer Organization:</b> Role of I/O devices in a computer system. Input Units: Keyboard, Terminals and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. Non Impact Printers and its types, Plotters, types of plotters, Sound cards, Speakers.									<b>6</b>
III	<b>Storage Fundamentals:</b> Primary Vs Secondary Storage, Data storage & retrieval methods. Primary Storage: RAM ROM, PROM, EPROM, EEPROM. Secondary Storage: Magnetic Tapes, Magnetic Disks. Cartridge tape, hard disks, Floppy disks Optical Disks, Compact Disks, Zip Drive, Flash Drives									<b>6</b>
IV	<b>Software:</b> Software and its needs, Types of S/W. System Software: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. Application S/W and its types: Word Processing, Spread Sheets Presentation, Graphics, DBMS s/w									<b>6</b>
V	<b>Operating System:</b> Functions, Measuring System Performance, Assemblers, Compilers and Interpreters. Batch Processing, Multiprogramming, Multi Tasking, Multiprocessing, Time Sharing, DOS, Windows, Unix/Linux.									<b>6</b>
<b>TOTAL HOURS</b>									<b>30</b>	

<b>Course Outcomes</b>		<b>Programme Outcomes</b>
CO	On completion of this course, students will	
CO1	Learn the basics of computer, Construct the structure of the required things in computer, learn how to use it.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Develop organizational structure using for the devices present currently under input or output unit.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Concept of storing data in computer using two header namely RAM and ROM with different types of ROM with advancement in storage basis.	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Work with different software, Write program in the software and applications of software.	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Usage of Operating system in information technology which really acts as a interpreter between software and hardware.	PO1, PO2, PO3, PO4, PO5, PO6
<b>Textbooks</b>		
1	Anoop Mathew, S. Kavitha Murugesan (2009), “Fundamental of Information Technology”, Majestic Books.	
2	Alexis Leon, Mathews Leon,” Fundamental of Information Technology”, 2 <sup>nd</sup> Edition.	
3	S. K Bansal, “Fundamental of Information Technology”.	
<b>Reference Books</b>		
1.	Bhardwaj Sushil Puneet Kumar, “Fundamental of Information Technology”	
2.	GG WILKINSON, “Fundamentals of Information Technology”, Wiley-Blackwell	
3.	A Ravichandran , “Fundamentals of Information Technology”, Khanna Book Publishing	
<b>Web Resources</b>		
1.	<a href="https://testbook.com/learn/computer-fundamentals">https://testbook.com/learn/computer-fundamentals</a>	
2.	<a href="https://www.tutorialsmate.com/2020/04/computer-fundamentals-tutorial.html">https://www.tutorialsmate.com/2020/04/computer-fundamentals-tutorial.html</a>	
3.	<a href="https://www.javatpoint.com/computer-fundamentals-tutorial">https://www.javatpoint.com/computer-fundamentals-tutorial</a>	
4.	<a href="https://www.tutorialspoint.com/computer_fundamentals/index.htm">https://www.tutorialspoint.com/computer_fundamentals/index.htm</a>	
5.	<a href="https://www.nios.ac.in/media/documents/sec229new/Lesson1.pdf">https://www.nios.ac.in/media/documents/sec229new/Lesson1.pdf</a>	

**Mapping with Programme Outcomes:**

<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>CO 1</b>	3	3	3	3	3	3
<b>CO 2</b>	3	3	3	3	3	3
<b>CO 3</b>	3	3	3	3	3	3
<b>CO 4</b>	3	3	3	3	2	3
<b>CO 5</b>	3	3	2	3	3	2
<b>Weightage of course contributed to each PSO</b>	15	15	14	15	14	14

**S-Strong-3 M-Medium-2 L-Low-1**

### Problem Solving Techniques

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
FC	Problem Solving Techniques	FC	2	-	-	-	2	2	25	75	100
<b>Learning Objectives</b>											
CO1	Familiarize with writing of algorithms, fundamentals of C and philosophy of problem solving.										
CO2	Implement different programming constructs and decomposition of problems into functions.										
CO3	Use data flow diagram, Pseudo code to implement solutions.										
CO4	Define and use of arrays with simple applications										
CO5	Understand about operating system and their uses										
UNIT	Contents								No. Of. Hours		
I	<b>Introduction:</b> History, characteristics and limitations of Computer. Hardware/Anatomy of Computer: CPU, Memory, Secondary storage devices, Input Devices and Output devices. Types of Computers: PC, Workstation, Minicomputer, Main frame and Supercomputer. Software: System software and Application software. <b>Programming Languages:</b> Machine language, Assembly language, High-level language, 4GL and 5GL-Features of good programming language. Translators: Interpreters and Compilers.								<b>6</b>		
II	<b>Data:</b> Data types, Input, Processing of data, Arithmetic Operators, Hierarchy of operations and Output. Different phases in Program Development Cycle (PDC). <b>Structured Programming: Algorithm:</b> Features of good algorithm, Benefits and drawbacks of algorithm. <b>Flowcharts:</b> Advantages and limitations of flowcharts, when to use flowcharts, flowchart symbols and types of flowcharts. <b>Pseudocode:</b> Writing a pseudocode. Coding, documenting and testing a program: Comment lines and types of errors. <b>Program design:</b> Modular Programming.								<b>6</b>		
III	<b>Selection Structures:</b> Relational and Logical Operators - Selecting from Several Alternatives – Applications of Selection Structures. <b>Repetition Structures:</b> Counter Controlled Loops – Nested Loops– Applications of Repetition Structures.								<b>6</b>		
IV	<b>Data:</b> Numeric Data and Character Based Data. <b>Arrays:</b> One Dimensional Array - Two Dimensional Arrays – Strings as Arrays of Characters.								<b>6</b>		

V	<b>Data Flow Diagrams:</b> Definition, DFD symbols and types of DFDs. <b>Program Modules:</b> Subprograms-Value and Reference parameters- Scope of a variable - Functions – Recursion. <b>Files:</b> File Basics-Creating and reading a sequential file- Modifying Sequential Files.	<b>6</b>
<b>TOTAL HOURS</b>		<b>30</b>
<b>Course Outcomes</b>		<b>Programme Outcomes</b>
CO	On completion of this course, students will	
CO1	Study the basic knowledge of Computers. Analyze the programming languages.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Study the data types and arithmetic operations. Know about the algorithms. Develop program using flow chart and pseudocode.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Determine the various operators. Explain about the structures. Illustrate the concept of Loops	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Study about Numeric data and character-based data. Analyze about Arrays.	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Explain about DFD. Illustrate program modules. Creating and reading Files	PO1, PO2, PO3, PO4, PO5, PO6
<b>Textbooks</b>		
1	<b>Stewart Venit</b> , “Introduction to Programming: Concepts and Design”, Fourth Edition, 2010, Dream Tech Publishers.	
<b>Web Resources</b>		
1.	<a href="https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm">https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm</a>	
2.	<a href="http://www.nptel.iitm.ac.in/video.php?subjectId=106102067">http://www.nptel.iitm.ac.in/video.php?subjectId=106102067</a>	
3.	<a href="http://utubersity.com/?page_id=876">http://utubersity.com/?page_id=876</a>	

### Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	3	3	3	3	3
CO 3	3	2	3	3	3	3
CO 4	3	3	2	3	3	3
CO 5	3	3	3	3	3	2
<b>Weightage of course contributed to each PSO</b>	15	14	14	15	15	14

**S-Strong-3 M-Medium-2 L-Low-1**

## Semester II

### Data Structures and Algorithms

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks			
								CIA	External	Total	
	<b>DATA STRUCTURES AND ALGORITHMS</b>	<b>CC III</b>	5	-	-		5	25	75	100	
<b>Learning Objectives</b>											
CO1	Understand the meaning asymptotic time complexity analysis and various data structures										
CO2	To enhancing the problem solving skills and thinking skills										
CO3	To write efficient algorithms and Programs										
CO4	To make the students learn best practices in PYTHON programming										
CO5	To understand how to handle the files in Data Structure										
UNIT	Contents									No. Of. Hours	
I	<b>Arrays and ordered Lists</b> Abstract data types – asymptotic notations – complexity analysis- Linked lists: Singly linked list – doubly linked lists - Circular linked list, General lists- stacks – Queues – Circular Queues – Evaluation of expressions									<b>15</b>	
II	<b>Trees and Graphs</b> Trees – Binary Trees – Binary Tree Traversal – Binary Tree Representations – Binary Search Trees - threaded Binary Trees - Application of trees (Sets). Representation of Graphs – Graph implementation – graph Traversals - Minimum Cost Spanning Trees – Shortest Path Problems-Application of graphs									<b>15</b>	
III	<b>Searching and Sorting</b> Sorting – Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Selection Sort. Searching – Linear search, Binary search									<b>15</b>	
IV	<b>Greedy Method and Dynamic programming</b> Greedy Method: Knapsack problem– Job Sequencing with deadlines – Optimal storage on tapes. General method – Multistage Graph Forward Method– All pairs shortest path – Single source shortest path – Search Techniques for Graphs – DFS – Connected Components – Bi-Connected Components									<b>15</b>	
V	<b>Backtracking</b> General Method – 8-Queen’s – Sum Of Subsets – Graph Colouring – Hamiltonian Cycles – Branch And Bound: General Method – Travelling Sales Person Problem									<b>15</b>	
<b>TOTAL HOURS</b>									<b>75</b>		
Course Outcomes									Programme Outcomes		
CO	On completion of this course, students will										
CO1	To understand the asymptotic notations and analysis of time and space complexity. To understand the concepts of Linked List, Stack and Queue.									PO1, PO2, PO3, PO4, PO5, PO6	

CO2	To understand the Concepts of Trees and Graphs. Perform traversal operations on Trees and Graphs. To enable the applications of Trees and Graphs.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	To apply searching and sorting techniques	PO1, PO2, PO3, PO4, PO5, PO6
CO4	To understand the concepts of Greedy Method To apply searching techniques.	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Usage of File handlings in python, Concept of reading and writing files, Do programs using files.	PO1, PO2, PO3, PO4, PO5, PO6

#### Textbooks

1	Seymour Lipshutz(2011),Schaum's Outlines - Data Structures with C, Tata McGraw Hill publications.
2	Ellis Horowitz and SartajSahni (2010), Fundamentals of Computer Algorithms, Galgotia Publications Pvt., Ltd.
3	Dr. K. Nagesware Rao, Dr. Shaik Akbar, ImmadiMurali Krishna, Problem Solving and Python Programming(2018)

#### Reference Books

1.	Gregory L.Heileman(1996), Data Structures, Algorithms and Object-Oriented Programming, McGraw Hill International Edition, Singapore.
2.	A.V.Aho, J.D. Ullman, J.E.Hopcraft(2000). Data Structures and Algorithms, Addison Wesley Publication.
3.	Ellis Horowitz and SartajSahni, Sanguthevar Raja sekaran (2010) ,Fundamentals of Computer Algorithms, Galgotia Publications Pvt.Ltd.

#### Web Resources

1.	<a href="https://www.tutorialspoint.com/data_structures_algorithms/index.htm">https://www.tutorialspoint.com/data_structures_algorithms/index.htm</a>
2.	<a href="https://www.programiz.com/dsa">https://www.programiz.com/dsa</a>
3.	<a href="https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/">https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/</a>

### Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	3	3	3	3	3
CO 3	3	3	3	3	1	3
CO 4	3	3	3	3	3	3
CO 5	3	3	3	3	3	2
<b>Weightage of course contributed to each PSO</b>	15	15	15	15	13	14

S-Strong-3 M-Medium-2 L-Low-1

## Data Structures and Algorithms Lab

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
	<b>DATA STRUCTURES AND ALGORITHMS LAB</b>	CC IV	-	-	5		5	25	75	100

### Course Objectives

To predict the performance of different algorithms in order to guide design decisions, provide theoretical estimation for the required resources of an algorithm to solve a specific computational problem

### LIST OF PROGRAMS

**Required Hour**

1. Perform stack operations
2. Perform queue operations
3. Perform tree traversal operations
4. Search an element in an array using linear search.
5. Search an element in an array using binary search
6. Sort the given set of elements using Merge Sort.
7. Sort the given set of elements using Quick sort.
8. Search the Kth smallest element using Selection Sort
9. Find the Optimal solution for the given Knapsack Problem using Greedy Method.
10. Find all pairs shortest path for the given Graph using Dynamic Programming method
11. Find the Single source shortest path for the given Travelling Salesman problem using Dynamic Programming method
12. Find all possible solution for an N Queen problem using backtracking method
13. Find all possible Hamiltonian Cycle for the given graph using backtracking method

**75**

### Course Outcomes

CO	On completion of this course, students will
CO1	To understand the concepts of Linked List, Stack and Queue.
CO2	Concepts of Trees and Graphs. Perform traversal operations on Trees and Graphs. To enable the applications of Trees and Graphs.
CO3	To apply searching and sorting techniques
CO4	To determine the concepts of Greedy Method To apply searching techniques.
CO5	Usage of File handlings in python, Concept of reading and writing files, Do programs using files.

## Learning Resources:

- **Recommended Texts**

1. Ellis Horowitz , Sartaj Sahni, Susan Anderson Freed, Second Edition , “Fundamentals of Data in C”, Universities Press
2. E. Horowitz, S. Sahni and S. Rajasekaran, Second Edition , “Fundamentals of Computer Algorithms “ Universities Press

- **Reference Books**

1. Seymour Lipschutz ,”Data Structures with C”, First Edition, Schaum’s outline series in computers, Tata McGraw Hill.
2. .2. R.Krishnamoorthy and G.Indirani Kumaravel, Data Structures using C, Tata McGrawHill – 2008.
3. A.K.Sharma, Data Structures using C , Pearson Education India,2011.
4. G. Brassard and P. Bratley, “Fundamentals of Algorithms”, PHI, New Delhi, 1997.
5. A.V. Aho, J.E. Hopcroft, J.D. Ullmann,, “The design and analysis of Computer
6. Algorithms”, Addison Wesley, Boston, 1974
7. Thomas H. Cormen, C.E. Leiserson, R L.Rivest and C. Stein, Introduction to Algorithms, Third edition, MIT Press, 2009
8. Sanjoy Dasgupta, C.Papadimitriou and U.Vazirani , Algorithms , Tata McGraw-Hill, 2008.

### Course Outcomes

CO	On completion of this course, students will
CO1	Implement data structures using C
CO2	Implement various types of linked lists and their applications
CO3	Implement Tree Traversals
CO4	Implement various algorithms in C
CO5	Implement different sorting and searching algorithms

**Mapping with Programme Outcomes:**

<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>CO 1</b>	3	3	3	3	3	3
<b>CO 2</b>	3	3	3	3	3	3
<b>CO 3</b>	3	3	2	2	3	3
<b>CO 4</b>	3	3	3	3	3	3
<b>CO 5</b>	3	3	3	3	1	2
<b>Weightage of course contributed to each PSO</b>	15	15	14	14	13	14

**S-Strong-3    M-Medium-2    L-Low-1**

## OFFICE AUTOMATION

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	<b>OFFICE AUTOMATION</b>	Specific Elective	2	-	-	-	2	2	25	75	100
<b>Course Objective</b>											
CO1	Understand the basics of computer systems and its components.										
CO2	Understand and apply the basic concepts of a word processing package.										
CO3	Understand and apply the basic concepts of electronic spreadsheet software.										
CO4	Understand and apply the basic concepts of database management system.										
CO5	Understand and create a presentation using PowerPoint tool.										
UNIT	Details									No. of Hours	
I	<b>Introductory concepts:</b> Memory unit– CPU-Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems & its features: DOS– UNIX–Windows .Introduction to Programming Languages.									6	
II	<b>Word Processing:</b> Open, Save and close word document; Editing text – tools, formatting, bullets; Spell Checker-Documents formatting–Paragraph alignment, indentation, headers and footers, numbering ;printing –Preview, options, merge.									6	
III	<b>Spreadsheets:</b> Excel opening, entering text and data, formatting, navigating; Formulas–entering, handling and copying; Charts–creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics.									6	
IV	<b>Database Concepts:</b> The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of data files; Understanding Programming environment in DBMS; Developing menu drive applications in query language(MS–Access).									6	
V	<b>Power point:</b> Introduction to Power point - Features – Understanding slide type casting & viewing slides–creating slideshows. Applying special object – including objects & pictures – Slide transition–Animation effects, audio inclusion, timers.									6	
<b>Total</b>									<b>30</b>		
Course Outcomes							Programme Outcomes				
CO	On completion of this course, students will										
1	Possess the knowledge on the basics of computers and its components						PO1,PO2,PO3,PO6,PO8				
2	Gain knowledge on Creating Documents, spreadsheet and presentation.						PO1,PO2,PO3,PO6				

3	Learn the concepts of Database and implement the Query In Database.	PO3,PO5,PO7
4	Demonstrate the understanding of different automation tools.	PO3,PO4,PO5,PO7
5	Utilize the automation tools for documentation, calculation and presentation purpose.	PO4,PO6,PO7,PO8
<b>Text Book</b>		
1	Peter Norton,-Introduction to Computers  -Tata McGraw-Hill.	
<b>Reference Books</b>		
1.	Jennifer Ackerman Kettel,Guy Hat-Davis,Curt Simmons,-Microsoft2003  ,Tata McGrawHill.	
<b>Web Resources</b>		
1.	<a href="https://www.udemy.com/course/office-automation-certificate-course/">https://www.udemy.com/course/office-automation-certificate-course/</a>	
2.	<a href="https://www.javatpoint.com/automation-tools">https://www.javatpoint.com/automation-tools</a>	

**Mapping with Programme Outcomes:**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	2	3	3	1
CO2	3	1	2	3	3	3
CO3	3	2	1	2	1	3
CO4	3	3	2	2	2	1
CO5	2	2	1	3	1	3
<b>Weightage of course Contributed to each PSO</b>	13	10	8	13	10	11

**S-Strong-3    M-Medium-2    L-Low-1**

## Introduction To HTML

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks			
								CIA	External	Total	
	<b>INTRODUCTION TO HTML</b>	Specific Elective	2	-	-		2	25	75	100	
<b>Learning Objectives</b>											
CO1	Insert a graphic within a webpage.										
CO2	Create a link within a webpage.										
CO3	Create a table within a webpage.										
CO4	Insert heading levels within a webpage.										
CO5	Insert ordered and unordered lists within a webpage. Create a webpage.										
UNIT	Contents								No. Of. Hours		
I	Introduction: Web Basics: What is Internet–Web browsers–What is Webpage –HTML Basics: Understanding tags.								<b>6</b>		
II	Tags for Document structure(HTML, Head, Body Tag).Block level text elements: Headings paragraph(<p>tag)–Font style elements:(bold, italic, font, small, strong ,strike, big tags)								<b>6</b>		
III	Lists: Types of lists: Ordered, Unordered–Nesting Lists –Other tags: Marquee, HR, BR-Using Images–Creating Hyperlinks.								<b>6</b>		
IV	Tables: Creating basic Table, Table elements, Caption–Table and cell alignment–Row span, Col span –Cell padding.								<b>6</b>		
V	Frames: Frame set–Targeted Links–No frame–Forms: Input, Text area, Select, Option.								<b>6</b>		
<b>TOTAL HOURS</b>								<b>30</b>			
Course Outcomes								Programme Outcomes			
CO	On completion of this course, students will										
CO1	Knows the basic concept in HTML Concept of resources in HTML								PO1, PO2, PO3,PO4,PO5,PO6		
CO2	Knows Design concept. Concept of Meta Data Understand the concept of save the files.								PO1, PO2, PO3,PO4,PO5,PO6		
CO3	Understand the page formatting. Concept of list								PO1, PO2, PO3,PO4,PO5,PO6		
CO4	Creating Links. Know the concept of creating link to email address								PO1, PO2,PO3, PO4,PO5,PO6		
CO5	Concept of adding images Understand the table creation.								PO1, PO2,PO3, PO4,PO5,PO6		
<b>Text books</b>											
1	–Mastering HTML5 and CSS3 Made Easy ll, Teach U CompInc.,2014.										
2	<b>Thomas Michaud, “Foundations of Web Design: Introduction to HTML &amp; CSS”</b>										

Web Resources	
1.	<a href="https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf">https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf</a>
2.	<a href="https://www.w3schools.com/html/default.asp">https://www.w3schools.com/html/default.asp</a>

**Mapping with Programme Outcomes:**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	2	3	3	3
CO3	2	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	2	3	3
<b>Weightage of course Contributed to each PSO</b>	14	15	14	14	15	15

**S-Strong-3      M-Medium-2      L-Low-1**

## Semester – III

### Tensor Flow

Semester	Subject Code	Category	Lecture Hrs		Theory Hrs		Practical		Credits
			Per week	Per Sem	Per week	Per Sem	Per week	Per Sem	
III	Tensor Flow	Core Paper – III	5	75	5	75	-	-	4

#### COURSE OBJECTIVE

1. To understand basic operations, constant, variables.
2. To learn the concepts of linear and nonlinear regressions.
3. To apply the basics of variable sharing principles.
4. To understand the basic of encoder and its networks
5. To comprehend the basics of language translations. .

#### COURSE OUTCOME

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

CO Number	CO Statement	Knowledge Level (K1 – K4)
CO1	The student will be able to understand the concept variables, data types, operators and expressions.	K4
CO2	The student will be able to learn the concepts of linear and nonlinear regressions.	K3
CO3	The student will be able to apply the concepts of variable sharing principle.	K2
CO4	The student will be able to understand the concepts of encoder with transformer	K2
CO5	The student will be able to comprehend the concepts of reinforcement learning in tensor flow.	K4

*Knowledge Level – K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze*

## MAPPING WITH PROGRAMME OUTCOME

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	M	S	S	S	S
CO2	S	S	S	M	S	S
CO3	S	S	M	M	S	M
CO4	S	S	S	S	S	M
CO5	S	S	S	M	S	M

S – Strong M – Medium L – Low

## SYLLABUS

UNIT	Contents	No. Of. Hours
I	<p><b>INTRODUCTION:</b></p> <p>Overview of Tensor flow - Why Tensor flow? Graphs and Sessions. Operations: Basic operations, constants, variables, Control dependencies, Data pipeline, Tensor Board.</p>	15
II	<p><b>LINEAR AND LOGISTIC REGRESSION:</b></p> <p>Tensor Flow’s Optimizers, tf.data – Birthrate - life expectancy, MNIST dataset. <b>Eager execution</b> - word2vec, linear regression</p>	15
III	<p><b>VARIABLE SHARING AND MANAGING EXPERIMENTS:</b></p> <p>Interfaces Name scope, variable Scope saver object, check points, Auto diff - word2vec. Introduction to ConvNet.</p>	15
IV	<p><b>CONVNET IN TENSORFLOW:</b></p> <p>Image classification, GANs, Variational Auto - Encoders, Recurrent Neural Networks - Character- level Language Modeling</p>	15
V	<p><b>SEQ 2 SEQ and ATTENTION:</b></p> <p>Neural machine translation, Beyond RNNs: Transformer, Tensor 2 Tensor: Dialogue agents, Reinforcement Learning in Tensor flow, Keras.</p>	15
<b>TOTAL HOURS</b>		<b>75</b>

**Distribution of Marks: Theory: 75% and Applications**

<b>Textbooks</b>	
1	Reza Bosagh Zadeh, Bharath Ramsundar, “Tensor Flow for Deep Learning”, "O' Reilly Media, Inc.", 2018.
<b>Reference Books</b>	
1	Giancarlo Zaccone, Md. Rezaul Karim, Ahmed Menshawy, “Deep Learning with Tensorflow”, 2017, CBS Publishers And Distributors Pvt Ltd.
2	Ian Goodfellow, “Deep Learning”, 2016, The MIT Press.
3	Francois Chollet, “Deep Learning with Python”, 2017, Simon and Schuster
<b>Web Resources</b>	
1.	<a href="https://www.w3schools.com/">https://www.w3schools.com/</a>
2.	<a href="https://www.geeksforgeeks.org/introduction-to-tensorflow/">https://www.geeksforgeeks.org/introduction-to-tensorflow/</a>
3.	<a href="https://www.guru99.com/tensorflow-tutorial.html">https://www.guru99.com/tensorflow-tutorial.html</a>
4.	<a href="https://www.javatpoint.com/tensorflow">https://www.javatpoint.com/tensorflow</a>
5.	<a href="https://www.tutorialspoint.com/tensorflow/index.html">https://www.tutorialspoint.com/tensorflow/index.html</a>

## TEACHING METHODOLOGY

- o Class room teaching.
- o Group Discussions
- o Seminars
- o Chart/Assignment
- o Smart Classroom

## SYLLABUS DESIGNERS

1. Mrs. G.Sangeetha Lakshmi , HOD, Department of Computer Science and Applications
2. Dr. R. Hamsaveni, Assistant Professor, Department of Computer Science and Applications.

## Tensor Flow Lab

Semester	Subject Code	Category	Lecture Hrs		Theory Hrs		Practical		Credits
			Per week	Per Sem	Per week	Per Sem	Per week	Per Sem	
III		Core Pract – III	3	45	-	-	3	45	3

### COURSE OBJECTIVE

1. To understand basic operations, constant, variables.
2. To learn linear and nonlinear regressions.
3. To understand basics of variables having principles.
4. To understand the basic of transformer.
5. To understand the basics of reinforcement learning in tensor flow.

### SYLLABUS

1. Implement concepts of Basic operations, constants and variables.
2. Implement concepts of Control dependencies
3. Implement concepts of Data pipe line, Tensor Board
4. Implement concepts of Tensor Flow's Optimizers
5. Implement concepts of Linear regression
6. Implement concepts of Interfaces Name scope, Saver object, check points
7. Implement concepts of Auto diff Example: word2vec
8. Implement concepts of Image classification
9. Implement concepts of GANs, Variational Auto-Encoders
10. Implement concepts of Variational Auto-Encoders
11. Implement concepts of Recurrent Neural Networks
12. Implement concepts of Seq2seq and Attention: Neural machine translation
13. Implement concepts of Transformer
14. Implement concepts of Tensor 2 Tensor: Dialogue agents
15. Implement concepts of Reinforcement Learning in Tensor flow, Keras

**Distribution of Marks: Program Output with Viva voce: 85% and Record: 15%**

### SYLLABUS DESIGNERS

1. Mrs. G. Sangeetha Lakshmi , HOD, Department of Computer Science and Applications
2. Dr. R. Hamsaveni, Assistant Professor, Department of Computer Science and Applications.

## Understanding Internet

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks			
								CIA	External	Total	
	<b>UNDERSTANDING INTERNET</b>	Skill Enhancement Course	1	-	-		1	25	75	100	
<b>Course Objectives</b>											
CO1	Knowledge of Internet medium										
CO2	Internet as a mass medium										
CO3	Features of Internet Technology,										
CO4	Internet as source of infotainment										
CO5	Study of internet audiences and about cyber crime										
UNIT	Contents								No. Of. Hours		
I	The emergence of internet as a mass medium–the world of world wide web‘.								6		
II	Features of internet as at echnology.								6		
III	Internet as a source of infotainment–classification based on content and style.								6		
IV	Demographic and psychographic descriptions of internet_ audiences‘ –effect Of internet on the values and life-styles.								6		
V	Present issues such as cyber crime and future possibilities.								6		
<b>TOTAL HOURS</b>									<b>30</b>		
Course Outcomes								Programme Outcomes			
CO	On completion of this course ,students will										
CO1	Knows the basic concept in internet Concept of mass medium and world wide web								PO1, PO2, PO3,PO4,PO5,P O6		
CO2	Knows the concept of internet as a technology.								PO1, PO2, PO3,PO4,PO5,P O6		
CO3	Understand the concept of infotainment and classification based on content And style								PO1, PO2,PO3, PO4,PO5,PO6		
CO4	Can be able to know about Demographic and psychographic description of internet								PO1, PO2,PO3, PO4,PO5,PO6		
CO5	Understand the concept of cyber crime and future possibilities								PO1, PO2, PO3,PO4,PO5,P O6		
<b>Textbooks</b>											
1	01.Barnouw, E and Krishnaswamy S [1990] Indian Film. NewYork, OUP.										
2	Kumar, Keval [1999] Mass Communication India. Mumbai, Jaico.										
3	<b>Srivastava, KM [1992] Media Issues. Sterling Publishers Pvt Ltd.</b>										

<b>Reference Book</b>	
1	Acharya, R N [1987] Television in India. Manas Publications, New Delhi.

**Mapping with Programme Outcomes:**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>
<b>CO1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>
<b>CO2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>
<b>CO5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>Weightage of course contributed to each PSO</b>	13	11	10	10	10	11

## Multimedia Systems

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks			
									CIA	External	Total	
	<b>Multimedia Systems</b>	Skill Enhancement Course	2	-	-	-	2	2	25	75	100	
<b>Learning Objective</b>												
LO1	Understand the definition of Multimedia											
LO2	To study about the Image File Formats, Sounds Audio File Formats											
LO3	Understand the concepts of Animation and Digital Video Containers											
LO4	To study about the Stage of Multimedia Project											
LO5	Understand the concept of Ownership of Content Created for Project Acquiring Talent											
UNIT	Details								No. of Hours			
<b>I</b>	Multimedia Definition-Use Of Multimedia-Delivering Multimedia-Text: About Fonts and Faces-Using Texting Multimedia -Computers and Text Font Editing and Design Tools-Hypermedia and Hypertext.								6			
<b>II</b>	Images: Plan Approach-Organize Tools-Configure Computer Workspace-Making Still Images-Color –Image File Formats. Sound: The Power of Sound-Digital Audio-Midi Audio- Midi vs. Digital Audio-Multimedia System Sounds Audio File Formats -Vaughan's Law of Multimedia Minimums-Adding Sound to Multimedia Project								6			
<b>III</b>	Animation: The Power of Motion-Principles of Animation-Animation by Computer-Making Animations that Work. Video: Using Video –Working with Video and Displays – Digital Video Containers-Obtaining Video Clips – Shooting and Editing Video								6			
<b>IV</b>	Making Multimedia: The Stage of Multimedia Project - The Intangible Needs -The Hardware Needs - The Software Needs – An Authoring Systems Needs – Multimedia Production Team.								6			
<b>V</b>	Planning and Costing: The Process of Making Multimedia – Scheduling – Estimating –RFPs and Bid Proposals. Designing and Producing- Content and Talent: Acquiring Content-Ownership of Content Created for Project-Acquiring Talent								6			
	<b>Total</b>							<b>30</b>				
<b>Course Outcomes</b>							<b>Programme Outcomes</b>					
<b>CO</b>	On completion of this course, students will											
<b>1</b>	understand the concepts, importance, application and the process of developing multimedia						PO1					
<b>2</b>	To have basic knowledge and understanding about image related processing						PO1,PO2					

<b>3</b>	To understand the framework of frames and bit images to animations	PO4,PO6
<b>4</b>	Speaks about the multimedia projects and stages of requirement in phases of project.	PO4,PO5,PO6
<b>5</b>	Understanding the concept of cost involved in multimedia planning, designing, and producing	PO3,PO8
<b>Text Book</b>		
<b>1</b>	Tay Vaughan, "Multimedia :Making It Work",8 <sup>th</sup> Edition, Osborne/McGraw-Hill,2001.	
<b>Reference Books</b>		
<b>1.</b>	Ralf Steinmetz & Klara Nahrstedt "Multimedia Computing, Communication & Applications", Pearson Education, 2012.	
<b>Web Resources</b>		
<b>1.</b>	<a href="https://www.geeksforgeeks.org/multimedia-systems-with-features-or-characteristics/">https://www.geeksforgeeks.org/multimedia-systems-with-features-or-characteristics/</a>	

**SEMESTER- IV**

**Object Oriented Programming with Java**

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
	<b>OBJECT ORIENTED PROGRAMMING WITH JAVA</b>	<b>CC VII</b>	5	-	-		5	25	75	100
<b>Learning Objectives</b>										
LO1	Object Oriented Programming with Java.									
LO2	Apply the OOPs concept in JAVA programming.									
LO3	Become proficient programmers through the java programming language.									
LO4	Give insight into real world applications.									
LO5	Get the attentions of users in user interface using graphics									
UNIT	Contents								No. Of Hours	
I	<b>Introduction:</b> Introduction to Java-Features of Java-Object Oriented Concepts-Software Evolution – Software Development, SDLC Models – SDLC steps – Software Testing – Software Quality – Lexical Issues-Data Types – Variables – Arrays – Operators – Control Statements – Classes – Objects –Constructors – Overloading method – Access control – static and fixed methods – Inner classes – Inheritance-Overriding Methods-Using super-Abstract class.								<b>15</b>	
II	<b>Packages &amp; Threads:</b> Packages-Access Protection-Importing Packages-Interfaces-Exception Handling-Throw and Throws- Thread-Synchronization-Messaging-Runnable Interface-Inter thread communication-Deadlock-suspending, resuming and stopping threads-Multithreading								<b>15</b>	
III	<b>Input/Output &amp; Collection API:</b> I/O Streams-File Streams-String Objects-String Buffer-Char Array – Java Utilities-Collections interface – Collection classes-Enumeration – Vector –Stack –Hash tables – String class.								<b>15</b>	
IV	<b>Networking:</b> Networking –Networking basics – java and the Net – Internet Address- TCP/IP Client Sockets –URL- URL Connection – TCP/IP Server Sockets – Datagrams.								<b>15</b>	

V	<b>Graphical User Interface in Java:</b> Working with windows using AWT Classes – Class Hierarchy of Window and Panel –AWT controls – Layout Managers – Menus- Menu bars - Dialog Boxes- File Dialog- Applets-Lifecycle of Applet-Types of Applets-Event handling-Applet tags - JDBC and connecting to Databases – CRUD operations.	<b>15</b>
<b>TOTAL HOURS</b>		<b>75</b>
<b>Course Outcomes</b>		<b>Programme Outcomes</b>
CO	On completion of this course, students will	
CO1	Use the syntax and semantics of java programming language and basic concepts of OOP.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Apply the concepts of Multithreading and Exception handling to Develop efficient and error free codes.	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Design event driven GUI and web related applications which mimic the real word scenario	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Build the internet-based dynamic applications using the concept of applets	PO1, PO2, PO3, PO4, PO5, PO6
<b>Textbooks</b>		
1	<b>P. Naughton and H. Schildt</b> (1999), Java 2 (The Complete Reference), Third Edition, Tata McGraw Hill Edition	
2	<b>K.K. Aggarwal &amp; Yogesh Sing</b> (2008), Software Engineering, Revised Third Edition, New Age International Publishers.	
<b>Reference Books</b>		
1	Cay S. Horstmann, Gary Cornell(2012), Core Java 2 Volume I, Fundamentals- Ninth Edition . Addison Wesley	
2	K.Arnold and J.Gosling, The Java Programming Language- Second Edition, ACM . Press/Addison- Wesley Publishing Co. New York	
<b>Web Resources</b>		
1	<a href="https://www.w3schools.com/java/java_oop.asp#:~:text=OOP%20provides%20a%20clear%20structure,code%20and%20shorter%20development%20time">https://www.w3schools.com/java/java_oop.asp#:~:text=OOP%20provides%20a%20clear%20structure,code%20and%20shorter%20development%20time</a>	
2	<a href="https://www.geeksforgeeks.org/object-oriented-programming-oops-concept-in-java/">https://www.geeksforgeeks.org/object-oriented-programming-oops-concept-in-java/</a>	

3	<a href="https://www.javatpoint.com/java-oops-concepts">https://www.javatpoint.com/java-oops-concepts</a>
4	<a href="https://www.coursera.org/learn/object-oriented-java">https://www.coursera.org/learn/object-oriented-java</a>
5	<a href="https://docs.oracle.com/javase/tutorial/java/concepts/index.html">https://docs.oracle.com/javase/tutorial/java/concepts/index.html</a>

**Mapping with Programme Outcomes:**

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	3	3	3	3	3
CO 3	3	3	2	3	3	3
CO 4	3	3	3	3	3	3
CO 5	3	3	3	3	2	3
<b>Weightage of course contributed to each PSO</b>	15	15	14	15	14	15

S-Strong-3      M-Medium-2      L-Low-1

## Object Oriented Programming with Java LAB

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
	<b>OBJECT ORIENTED PROGRAMMING WITH JAVA LAB</b>	<b>CC VIII</b>	-	-	5		5	25	75	100
<p><b>Learning Objectives:</b></p> <ol style="list-style-type: none"> <li>1. Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.</li> <li>2. Read and make elementary modifications to Java programs that solve real-world problems.</li> <li>3. Be able to create an application using string concept.</li> <li>4. Be able to create a program using files in application.</li> <li>5. Be able to create an Applet to create an application.</li> </ol>										
							<b>Required Hour</b>			
<p><b>Lab Exercises:</b></p> <ol style="list-style-type: none"> <li>1. Program using Class and Object.</li> <li>2. Program using Constructors.</li> <li>3. Program using Command-Line Arguments.</li> <li>4. Program using Random Class.</li> <li>5. Program using Vectors.</li> <li>6. Program using String Tokenizer Class.</li> <li>7. Program using Interface.</li> <li>8. Program using all forms of Inheritance.</li> <li>9. Program using String class.</li> <li>10. Program using String Buffer class.</li> <li>11. Program using Exception Handling.</li> <li>12. Implementing Thread based applications</li> <li>13. Program using Packages.</li> <li>14. Program using Files.</li> </ol> <p><b>Applets:</b></p> <ol style="list-style-type: none"> <li>15. Working with Colors and Fonts.</li> <li>16. Parameter passing technique.</li> <li>17. Drawing various shapes using Graphical statements.</li> <li>18. Usage of AWT components and Listener in suitable applications.</li> </ol>							<b>60</b>			

**Mapping with Programme Outcomes:**

<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>CO 1</b>	3	3	3	3	3	3
<b>CO 2</b>	3	3	3	3	3	3
<b>CO 3</b>	3	3	2	3	3	2
<b>CO 4</b>	3	3	3	3	3	3
<b>CO 5</b>	3	2	3	3	2	3
<b>Weightage of course contributed to each PSO</b>	15	14	14	15	14	14

**S-Strong-3****M-Medium-2****L-Low-1**

## Quantitative Aptitude

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	<b>Quantitative Aptitude</b>	Skill Enhancement Course	2	-	-	-	2	2	25	75	100
<b>Learning Objective</b>											
LO1	To understand the basic concepts of numbers										
LO2	Understand and apply the concept of percentage, profit & loss										
LO3	To study the basic concepts of time and work, interests										
LO4	To learn the concepts of permutation, probability, discounts										
LO5	To study about the concepts of data representation, graphs										
UNIT	Details							No. of Hours			
I	Numbers - HCF and LCM of numbers – Decimal fractions-Simplification-Square root and cube roots-Average-problems on Numbers.							6			
II	Problems on Ages – Surds and Indices - percentage - profits and loss – ratio and proportion – partnership –Chain rule.							6			
III	Time and work – pipes and cisterns – Time and Distance - Problems on trains – Boats and streams – simple interest - Compound interest – Logarithms – Area –Volume and surface area – races and Games of skill.							6			
IV	Permutation and combination – probability – True Discount – Bankers Discount – Height and Distances – Odd man out & Series.							6			
V	Calendar – Clocks – stocks and shares- Data representation – Tabulation – Bar graphs - Pie charts – Line graphs.							6			
	<b>Total</b>							<b>30</b>			
<b>Course Outcomes</b>								<b>Programme Outcome</b>			
CO	On completion of this course, students will										
1	Understand the concepts, application and the problems of numbers							PO1			

2	To have basic knowledge and understanding about percentage, profit & loss related processings	PO1,PO2
3	To understand the concepts of time and work	PO4,PO6
4	Speaks about the concepts of probability, discount	PO4,PO5,PO6
5	Understanding the concept of problem solving involved in stocks& shares, graphs	PO3,PO8
<b>Text Book</b>		
1	Quantitative Aptitude, R .S. AGGARWAL. ,S. Chand & Company Ltd.,	
<b>Reference Books</b>		
1.		
<b>Web Resources</b>		
1.	<a href="https://www.javatpoint.com/aptitude/quantitative">https://www.javatpoint.com/aptitude/quantitative</a>	
2.	<a href="https://www.toppr.com/guides/quantitative-aptitude/">https://www.toppr.com/guides/quantitative-aptitude/</a>	

**Mapping with Programme Outcomes:**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	1	2	-	2
CO2	2	2	2	3	3	1
CO3	3	2	2	2	3	3
CO4	3	2	3	2	3	3
CO5	2	3	1	2	3	3
<b>Weightage of course Contributed to each PSO</b>	12	12	9	11	12	12

**S-Strong-3 M-Medium-2 L-Low-1**

## PHP Programming

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	<b>PHP PROGRAMMING</b>	Skill Enhancement Course	2				2	2	25	75	100
<b>Learning Objective</b>											
LO1	To provide the necessary knowledge on basics of PHP.										
LO2	To design and develop dynamic, database – driven web applications using PHP version.										
LO3	To get an experience on various web application development techniques.										
LO4	To learn the necessary concepts for working with the files using PHP.										
LO5	To get a knowledge on OOPS with PHP.										
UNIT	Details									No. of Hours	
I	Introduction to PHP – Basic Knowledge of websites –Introduction of Dynamic Website – Introduction to PHP – Scope of PHP -XAMPP and WAMP Installation									6	
II	PHP Programming Basics – Syntax of PHP-Embedding PHP in HTML – Embedding HTML in PHP. Introduction to PHP Variable - Understanding Data Types –Using Operators -Using Conditional Statements –If (), else if() and else if condition Statement.									6	
III	Switch() Statements – Using the while() Loop-Using the for() Loop PHP Functions. PHP Functions – Creating an Array – Modifying Array Elements – Processing Arrays with Loops – Grouping Form Selections with Arrays – Using Array Functions.									6	
IV	PHP Advanced Concepts - Reading and Writing Files -Reading Data From a File.									6	
V	Managing Sessions and Using Session Variables –Destroying a Session – Storing Data in Cookies – Setting Cookies.									6	
<b>Total</b>									<b>30</b>		
Course Outcomes							Programme Outcomes				
CO	On completion of this course, students will										
1	Write PHP scripts to handle HTML forms						PO1, PO4, PO6, PO8.				

2	Write regular expressions including modifiers, operators, and meta characters.	PO2, PO5, PO7.
3	Create PHP Program using the concept of array.	PO3, PO6, PO8.
4	Create PHP programs that use various PHP library Functions	PO2, PO3, PO5, PO8.
5	Manipulate files and directories.	PO3, PO5, PO6.
<b>Text Book</b>		
1	<b>Head First PHP &amp;MySQL: A Brain-Friendly Guide – 2009 - Lynnmighley and Michael Morrison.</b>	
2	<b>The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL- Alan Forbes</b>	
<b>Reference Books</b>		
1.	PHP: The Complete Reference –Steven Holzner.	
2.	DT Editorial Services (Author),– <i>HTML 5Black Book (CoversCSS3,JavaScript,XML, XHTML,AJAX,PHP,jQuery)</i>   ,Paper rback2016, 2 <sup>nd</sup> Edition.	
<b>Web Resources</b>		
1.	Refer MOOC Courses like NPTEL and SWAYAM	
2.	<a href="https://www.w3schools.com/php/default.asp">https://www.w3schools.com/php/default.asp</a>	

#### Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	1	1	-	1
CO2	2	-	1	1	2	1
CO3	3	3	1	1	-	1
CO4	1	3	2	1	-	1
CO5	3	2	1	1	-	1
<b>Weightage of course contributed to each PSO</b>	12	11	6	5	2	5

S-Strong-3    M-Medium-2    L-Low-1



