Department of Information Technology

School of Computing Sciences

VISION

➢ The Department of Information Technology aims to produce globally competent graduates, skilled intellectual professionals and a successful entrepreneur in the field of computer science and Information Technology to meet the current challenges in the fast growing IT industry.

MISSION

➢ Provide a strong theoretical and practical knowledge to the students in computer science discipline.

➢ To equip our Students to attain skill set Imperative to harness the opportunities present in this dynamic Environment.

➢ Provide technical & skill based quality training to the students in the field of Information technology

➢ Empowering the Youth in rural communities with computer knowledge

➢ Inculcate knowledge about Socio-economic duties & responsibilities, Human & ethical values to become an optimistic global citizen and a life-long learner.

➢ Provide environmental education to build knowledge on environmental issues and also to take necessary actions to keep our environment healthy and sustainable for the future.

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES (VISTAS) - CHENNAI - 600 117

REGULATIONS 2018

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

PEO1: Possess knowledge and understanding of group dynamics, recognize opportunities and contribute positively to collaborative-multidisciplinary scientific research,.

PEO2: Critically analyze complex problems and apply independent judgment for fusing information to conduct Research in a wider theoretical, practical and policy context in Computer Science.

PEO3: Understand the relevance of the research to the society by the ethical and economic connotations of research outcomes and an understanding of responsibility to contribute to the community for sustainable development of society.

PEO4: Apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyze interpret data, demonstrate higher order skill and contribute individually or in groups to the development of technological knowledge in Computer Science.

PEO5 : Demonstrate a capacity for self-management and team work, decision making based on open-mindedness, objectivity and rational analysis in order to achieve common goals.

PROGRAM OUTCOME (PO)

PO1: Critical Thinking: Apply knowledge of Computer Science to identify, analyse problems and to provide effective solution in the area of Computing.

PO2: Computing Skills and Ethics: Analyse a problem, and identify and define the computing requirements appropriate to its solution.

PO3: Analytical skill: Ability to design, develop algorithms and provide software solutions to cater the industrial needs.

PO4: Modern Tool Usage: Use current techniques, skills, and tools necessary for computing practices

PO5: Employability Skills: Inculcate skills to excel in the fields of Information Technology and its Enabled services, Government and Private sectors, Teaching and Research.

PO6: Ethics: Insists ethical responsibilities, human and professional values and make their contribution to the society.

PO7: Self Directed and Life-long Learning: Engaged in lifelong learning to equip them to changing environment and be prepared to take-up mastering programmes.

PO8: Individual and team work: Function effectively as an individual, and as a member or a leader in diverse team and multidisciplinary settings.

PO9: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO10: Project management and finance: Demonstrate knowledge and understanding of the problem and management principles and apply these to one’s own work, as a member and engineering and management principles and apply these to one’s own work, as a member.

PO11: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO12: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Be an expert as System/Network Administrator with comprehensive knowledge in Network design & analysis, Network security and Software defined networks.

PSO2: Be a proficient Software Engineer by obtaining exhaustive knowledge in Software Requirement Analysis, Design, Coding, Testing and Documentation.

PSO3: Inculcate students to communicate effectively and to improve their competency skills to solve real time problems.

Vels Institute of Science Technology & Advanced Studies

School of Computing Sciences

Department of Information Technology

Board of Studies Members

S.No	Name & Designation	Address	Role
1	Dr.P.Mayilvahanan Professor & Head	Department of Computer Science, School of Computing Sciences, VISTAS, Chennai.	Chairman
2	Dr. T. Velmurugan Associate Professor & Head	Department of Computer Science, DG Vaishnav College, Chennai.	Industry Expert (External Member)
3	Dr. P. Magesh Kumar Managing Director	Calibsoft Technologies Pvt Ltd., Chennai.	Academic Expert (External Member)
4	Mr.R. Balamurugan Software Engineer	SCOPUS Technologies Ltd., Chennai	Alumni Member
5	Dr.S.Prasanna Professor & Head	Department of Computer Applications, School of Computing Sciences, VISTAS, Chennai	Internal Member
6	Dr. T. Kamalakannan Professor & Head	Department of Information Technology, School of Computing Sciences, VISTAS, Chennai	Internal Member

Vels Institute of Science Technology & Advanced Studies

School of Computing Sciences

Choice Based Credit System

Degree Of Master Of Information Technology

Regulation 2021

1. DURATION OF THE PROGRAMME

1.1. Two years (Four semesters)

1.2. Each academic year consist of two semesters. The odd semester starts from July to November and the even semester is from January to May.

1.3. Each semester comprises of 90 working days.

2. ELIGIBILITY FOR ADMISSION

2.1. Candidates for admission to the first year of the Degree of Master of Information Technology shall be required to pass any UG degree Examinations (Academic Stream) accepted as equivalent thereof by the Syndicate of the Vels Institute of Science, Technology & Advanced Studies.

3. CREDIT REQUIRMENTS AND ELIGIBILITY FOR AWARD OF DEGREE

3.1. A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years and passed the examinations of all the four semesters prescribed earning a minimum of 90 credits as per the distribution given in for Part I, II, III and also fulfilled such other conditions as have been prescribed thereof.

4. COURSE OF STUDY, CREDITS AND SCHEME OF EXAMINATION

In PG Programme, Core courses i.e. major courses that compulsorily required for each of the programme of study (CC),Discipline Specific Elective Course (DSE), Generic Elective (GE) , Internship and Skill Enhancement Course (SEC).

4.1 Credit Assignment Each course is assigned certain number of credits based on the following: Contact period per week CREDITS

1 Lecture Period	-	1 Credit
1 Tutorial Period	-	1 Credit
2 Practical Periods	-	1 Credit

(Laboratory / Seminar / Project Work / etc.)

5. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER

5.1. **Eligibility:** Students shall be eligible to a subsequent semester only if they earn sufficient attendance as prescribed there by the Board of Management from time to time.

5.2. **Attendance:** All Students must earn 60% and above of attendance for appearing for the University Examination. (Theory/Practical)

5.3. **Condonation of shortage of attendance:** If a Student fails to earn the minimum attendance (Percentage stipulated), the HODs shall condone the shortage of attendance up to a maximum limit of 10% (i.e. between 65% and above and less than 60%) after collecting the prescribed fee towards the condonation of shortage of attendance should be remitted to the University.

5.4. **Non-eligibility for condonation of shortage of attendance:** Students who have secured less than 65 % but more than 50 % of attendance are NOT ELIGIBLE for condonation of shortage of attendance and such Students will not be permitted to appear for the regular examination, but will be allowed to proceed to the next year/next semester of the program

5.5. **Detained students for want of attendance:** Students who have earned less than 50% of attendance shall be permitted to proceed to the next semester and to complete the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the University from time to time.

5.6. **Condonation of shortage of attendance for married women students:** In respect of married women students undergoing UG programs, the minimum attendance for condonation (Theory/Practical) shall be relaxed and prescribed as 55% instead of 65% if they conceive during their academic career. Medical certificate from the Doctor together with the attendance details shall be forwarded to the university to consider the condonation of attendance mentioning the category.

5.7. **Zero Percent (0%) Attendance:** The Students, who have earned 0% of attendance, have to repeat the program (by rejoining) without proceeding to succeeding semester and they have to obtain prior permission from the University immediately to rejoin the program.

6. EXAMINATION AND EVALUATION

6.1. Register for all subjects: Students shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination. For this purpose, Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.

6.2. Marks for Internal and End Semester Examinations for PART I, II, III

6.2.1. There shall be no passing minimum for Internal.

6.2.2. For external examination, passing minimum shall be 50% [Fifty Percentage] of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva-Voce.

6.2.3. In the aggregate [External/Internal] the passing minimum shall be of 50%.

6.2.4. He / She shall be declared to have passed the whole examination, if he / she passes in all the papers and practical wherever prescribed as per the scheme of the examinations by earning 90 CREDITS in Part I, II, III.

7. MAXIMUM PERIOD FOR COMPLETION OF THE PROGRAMS TO QUALIFY FOR A DEGREE

7.1. A Student who for whatever reasons is not able to complete the programs within the normal period (N) or the Minimum duration prescribed for the programme, may be allowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (

8. REVISION OF REGULATIONS, CURRICULUM AND SYLLABI

The University may from time to time revise, amend or change the Regulations, Curriculum, Syllabus and Scheme of examinations through the Academic Council with the approval of the Board of Management.

Vels Institute of Science and Technology and Advanced studies (VISTAS)

M.Sc.,(Information Technology)

Courses of Study and Scheme of Assessment

M.Sc.,(Information Technology) Course Components

Component	I Sem	II Sem	III Sem	IV Sem	Total Credits

Core Courses	16	16	16	14	62
Ability Enhancement Courses (AEC)	-	-	-	-	-
Discipline Specific Elective(DSE)&Generic Elective(GEC)	7	3	6	4	20
Skill enhancement Course(SEC)& SI	2	4	2	-	8
Total Credits	**25**	**23**	**24**	**18**	**90**

Learning Outcomes based Curriculum Framework

1.Introduction

Computer Science & Information Technology (CS) has been evolving as an important branch of science and engineering throughout the world in last couple of decades and it has carved out a space for itself like any other disciplines of basic science and engineering. Computer science is a discipline that spans theory and practice and it requires thinking both in abstract terms and in concrete terms. Nowadays, practically everyone is a computer user, and many people are even computer programmers. Computer Science can be seen on a higher level, as a science of problem solving and problem solving requires precision, creativity, and careful reasoning. The ever-evolving discipline of computer science also has strong connections to other disciplines. Many problems in science, engineering, health care, business, and other areas can be solved effectively with computers, but finding a solution requires both computer science expertise and knowledge of the particular application domain.

Computer science has a wide range of specialties. These include Computer Architecture, Software Systems, Graphics, Artificial Intelligence, Computational Science, and Software Engineering. Drawing from a common core of computer science knowledge, each specialty area focuses on specific challenges. Computer Science is practiced by mathematicians, scientists and engineers. Mathematics, the origins of Computer Science, provides reason and logic. Science provides the methodology for learning and refinement. Engineering provides the techniques for building hardware and software.

Universities and other HEIs introduced programmes of studies in computer science as this discipline evolved itself to a multidisciplinary discipline. Information Technology is growing rapidly. Increasing applications of computers in almost all areas of human endeavour has led to vibrant industries with concurrent rapid change in technology. Unlike other basic disciplines, developing core competency in this discipline that can be reasonably stable becomes a challenge. In India, it was initially introduced at the Master (postgraduate) level as MCA and M.Tech. Later on, engineering programmes such as B.Tech and B.E in Computer Science & Engineering and in Information Technology were introduced in various engineering College/Institutions to cater to the growing demand for trained engineering manpower in IT industries. Parallelly, BSc and MSc programmes with specialisation in Computer Science were introduced to train manpower in this highly demanding area. M.Scin Computer Science are being planned and introduced in different colleges and institutions.

Computer Science education at PGlevel (+2) will result in earning Mater of Science degree in CS. Students so graduated, in CS in PG level leading to research as well as R&D, can be employable at IT industries, or can pursue a teachers' training programme such BEdin Computer Education, or can adopt a business management career. M.Sc(CS)aims at laying a strong foundation of CS at an advanced stage of the career along with two other branch such as M.C.A, M.Tech, B.E/B.Tech etc. There are several employment opportunities and after successful completion of an PG programmein CS, graduating students can fetch employment directly in companies as Web Developer, Software Engineer, Network Administrator, Data Scientist, or AI/ML personnel.

The Learning Outcome-based Curriculum Framework in Computer Science is aimed at allowing flexibility and innovation in design and development of course content, in method of imparting training, in teaching learning process and in assessment procedures of the learning outcomes. The emphasis in computer science courses, in outcome-based curriculum framework, help students learn solving problems, accomplishing IT tasks, and expressing creativity, both individually and collaboratively. The proposed framework will help Students learn programming techniques and the syntax of one or more programming languages.

Many of the learning outcomes of Computer Science can be achieved only by programming a computer for several different meaningful purposes. All students must, therefore, have access to a computer with a modern programming language installed. The computer science framework does not prescribe a specific language. The teacher and students will decide which modern programming languages students will learn. More importantly, students will learn to adapt to changes in programming languages and learn new languages as they are developed.

The present Learning Outcome-based Curriculum Framework for Master degrees in CS is intended to facilitate the students to achieve the following.

- To develop an understanding and knowledge of the advanced theory of Computer Science and Information Technology with good foundation on theory, systems and applications such as algorithms, data structures, data handling, data communication and computation.
- To develop the ability to use this knowledge to analyse new situations
- To acquire necessary and state-of-the-art skills to take up industry challenges. The objectives and outcomes are carefully designed to suit to the above-mentioned purpose.

- The ability to synthesize the acquired knowledge, understanding and experience for a better and improved comprehension of the real-life problems

2. To learn skills and tools like mathematics, statistics, physics and electronics to find the solution, interpret the results and make predictions for the future developments.Curriculum Planning- Learning Outcomes-basedApproach

2.1 Nature and Extent of the M.Sc.,(Information Technology)Programme

The Master programs in Information Technology builds on science-based education at UG level. The +2 senior secondary school education aims and achieves a sound grounding in understanding the basic scientific temper with introduction to process of computation by introducing some programming languages. This prepares a young mind to launch a rigorous investigation of exciting world of computer science.

Framing and implementation of curricula and syllabi is envisaged to provide an understanding of the basic connection between theory and experiment and its importance in understanding the foundation of computing. This is very critical in developing a scientific temperament and to venture a career which a wide spectrum of applications as well as theoretical investigations. The undergraduate curriculum provides students with theoretical foundations and practical experience in both hardware and software aspects of computers. The curriculum in computer science is integrated with courses in the sciences and the humanities to offer an education that is broad, yet of enough depth and relevance to enhance student employment opportunities upon graduation. As a Bachelor's degree program, the curriculum is based on the criterion that graduates are expected to function successfully in a professional employment environment immediately upon graduation.

The Master program in Computer Science is presently being offered though the courses designed for granting the following degrees by various colleges and universities in India. All the courses are of 2-year duration spread over Four semesters.

2.2 Types of Courses

2.2.1Core Course (CC)

A core course is a mandatory course required in degree. **Core course** of study refers to a series or selection of courses that all students are required to complete before they can move on to the next level in their education or earn a diploma. The general educational purpose of a core course of study is to ensure that all students take and complete courses that are academically and culturally essential. These are the courses that teach students the foundational knowledge and skills they will need in securing the specific degree or diploma. The core courses are designed with an aim to cover the basics that is expected of a student to imbibe in that particular discipline. Thus, a course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course. The present document specifies the core courses for B.Sc. The courses (papers, as referred popularly) under this category are going to be taught uniformly across all universities with 30% deviation proposed in the draft. The purpose of fixing core papers is to ensure that all the institutions follow minimum common curriculum so that each institution/ university adheres to common minimum standard.

2.2.1 Electives

Generally a course which can be chosen from a pool of courses and which maybe very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course. Different types of elective courses mandated in the present framework are the following.

- Domain Specific Elective(DSE)
- Generic Elective(GE)

2.2.2 Discipline Specific Elective (DSE)

Elective courses offered under the main discipline/subject of study is referred to as Discipline Specific Elective. The list provided under this category are suggestive in nature and HEI has freedom to suggest its own papers under this category based on their expertise, specialization, requirements, scope and need. The University/Institute may also offer discipline related elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).

2.2.3 Generic Elective (GE)

An elective course chosen from another discipline/subject, with an intention to seek exposure beyond discipline/s of choice is called a Generic Elective. The purpose of this category of papers is to offer the students the option to explore disciplines of interest beyond the choices they make in Core and Discipline Specific Elective papers. The list provided under this category are suggestive in nature and HEI can design its own papers under thiscategory based on available expertise, specialization, and contextual requirements, scope andneed.

2.2.4 Dissertation/Project

An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a candidate studies such a course on his/her own with an advisory support by a teacher/faculty member is called dissertation/project.

2.2.5 Skill Enhancement Courses (SEC): SEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc. SEC are 4 courses for General bachelor programmes. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge and should contain both theory and lab/hands-on/training/field work.
The main purpose of these courses is to provide students life-skills in hands-on mode to increase their employability. The list provided under this category are suggestive in nature and each university has freedom to suggest their own papers under this category based on their expertise, specialization, requirements, scope and need.

2.2.5 Practical/Tutorial

For each core course and DSE course there will be one practical. The list of practical provided is suggestive in nature and each university has the freedom to add/subtract/edit practical from the list depending on their faculty and infrastructure available. Addition will however be of similarnature.

2.3 Aims of Master of Science Programmes in ComputerScience

The Master of Science degree in Computer Science emphasizes problem solving in the context of algorithm development and software implementation and prepares students for effectively using modern computer systems in various applications. The curriculum provides required computer science courses such as programming languages, data structures, computer architecture and organization, algorithms, database systems, operating systems, and software engineering; as well as elective courses in artificial intelligence, computer-based communication networks, distributed computing, information security, graphics, human-computer interaction, multimedia, scientific computing, web technology, and other current topics in computer science.

The aim of this Master degree is to deliver a modern curriculum that will equip graduates with strong theoretical and practical backgrounds to enable them to excel in the workplace and to be lifelong learners. The purpose of the M.Sc programs in computer science are twofold: (1) to prepare the student for a position involving the design, development and implementation of computer software/hardware, and (2) to prepare the student for entry into a program of Research study in computer science/engineering and related fields.

The Master of Science program with Computer Science as one subject (M.Sc with CS) focus on the concepts and techniques used in the design and development of software systems. Students in this program explore the conceptual underpinnings of Computer Science -- its fundamental algorithms, programming languages, operating systems, and software engineering techniques. In addition, students choose from a rich set of electives that includes data science, computer graphics, artificial intelligence, database systems, computer architecture, and computer networks, among other topics. A generous allotment of free electives allows students to combine study in computer science with study in auxiliary fields to formulate a program that combines experiences across disciplines.

3. Graduate Attributes

Graduate Attributes (GA) are the qualities, skills and understandings that students should develop during their time with the HEI. These are qualities that also prepare graduates as agents of social good in future. Graduate Attributes can be viewed as qualities in followingsubcategories.

- Knowledge of thediscipline
- Creativity
- IntellectualRigour
- Problem Solving andDesign
- EthicalPractices
- LifelongLearning
- Communication and SocialSkills

Among these attributes, categories attributes under *Knowledge of the Discipline* are specific to a programme of study.

3.1Knowledge of Discipline of CS

Knowledge of a discipline is defined as "command of a discipline to enable a smooth transition and contribution to professional and community settings. This Graduate Attribute describes the capability of demonstrating comprehensive and considered knowledge of a discipline. It enables students to evaluate and utilize information and apply their disciplinary knowledge and their professional skills in the workplace.

3.1.1 Creativity

Creativity is a skill that underpins most activities, although this may be less obvious in some disciplines. Students are required to apply imaginative and reflective thinking to

their studies. Students are encouraged to look at the design or issue through differing and novel perspectives. Creativity allows the possibility of a powerful shift in outlook and enables students to be open to thinking about different concepts and ideas.

3.1.2 Intellectual Rigour

Intellectual Rigouris the commitment to excellence in all scholarly and intellectual activities, including critical judgement. The students are expected in having clarity in thinking. This capability involves engaging constructively and methodically when exploring ideas, theories and philosophies. It also relates to the ability to analyse and construct knowledge with depth, insight and intellectual maturity.

3.1.3 Problem *Solving and Design*

Problem solving skills empower students not only within the context of their programmes, but also in their personal and professional lives. Many employers cite good problem

solving skills as a desired attribute that they would like graduates to bring to the workplace. With an ability to seek out and identify problems, effective problem solvers are able to actively engage with a situation, think creatively, to consider different perspectives to address identified challenge, to try out possible solutions and subsequently evaluate results as a way to make decisions. Through this process they can consolidate new and emergent knowledge and develop a deeper understanding of their subject discipline.

3.1.4 Ethical Practices

Ethical practice is a key component of professionalism and needs to be instilled in curricula across courses. When operating ethically, graduates are aware that we live in a diverse society with many competing points of view. Ethical behaviour involves tolerance and responsibility. It includes being open-minded about cultural diversity, linguistic difference, and the complex nature of our world. It also means behaving appropriately towards colleagues and the community and being sensitive to local and global socialjustice issues.

3.1.5 Life-Long Learning

The skill of being a lifelong learner means a graduate is open, curious, willing to investigate, and consider new knowledge and ways of thinking. This flexibility of mind means they are always amenable to new ideas and actively seek out new ways of learning or understanding the world.

3.1.6 Communication and Social Skills

The ability to communicate clearly and to work well in a team setting is critical to sustained and successful employment. Good communication and social skills involve the ability to listen to, as well as clearly express, information back to others in a variety of ways - oral, written, and visual - using a range of technologies.

3.1.7 Self-Management

Graduates must have capabilities for self-organisation, self-review, personal development and life-long learning.

4. Qualification Descriptors

Qualification descriptors are generic statements of the outcomes of study. Qualification descriptors are in two parts. The first part is a statement of outcomes, achievement of which a student should be able to demonstrate for the award of the qualification. This part will be of interest to those designing, approving and reviewing academic programmes. They will need to be satisfied that, for any programme, the curriculum and assessments provide all students with the opportunity to achieve, and to demonstrate achievement of, the outcomes. The second part is a statement of the wider abilities that the typical student could be expected to have developed. It will be of assistance to employers and others with an interest in the general capabilities of holders of the qualification. The framework has the flexibility to accommodate diversity and innovation, and to accommodate new qualifications as the need for them arises. It should be regarded as a framework, not as astraitjacket.

4.1 Qualification Descriptor for M.Sc.,(IT)

On completion of M.Sc. with Computer Science, the expected learning outcomes that a student should be able to demonstrate are the following.

QD-1. Fundamental understanding of the principles of Computer Scienceand its connections with other disciplines

QD-2. Procedural knowledge that creates different types of professionals related to Computer Science, including research and development, teaching and industry, government and public service;

QD-3. Skills and tools in areas related to computer science and current developments in the academic field of study.

QD-4. Use knowledge, understanding and skills required for identifying problems and issues, collection of relevant quantitative and/or qualitative data drawing on a wide range of sources, and their application, analysis and evaluation using methodologies as appropriate to Computer Science for formulatingsolutions

QD-5. Communicate the results of studies undertaken inComputer Science accurately ina range of different contexts using the main concepts, constructs andtechniques

QD-6. Meet one's own learning needs, drawing on a range of current research and development work and professional materials

QD-7. Apply Computer Science knowledge and transferable skills to new/unfamiliar contexts,

QD-8. Demonstrate subject-related and transferable skills that are relevant to industry and employment opportunities.

5. Programme LearningOutcomes

These outcomes describe what students are expected to know and be able to do by the time of graduation. They relate to the skills, knowledge, and behaviours that students acquire in their graduation through the program

5.1 Programme Learning Outcomes for M.Sc.,(IT)

The Master of Science with Computer Science (MSc with CS) program enables students to attain, by the time of graduation:

PLO-A. Demonstrate the aptitude of Computer Programming and Computer based problem solving skills.

PLO-B. Display the knowledge of appropriate theory, practices and tools for the specification, design,implementation

PLO-C. Ability to learn and acquire knowledge through online courses available at different MOOCProviders.

PLO-D. Ability to link knowledge of Computer Science with other two chosen auxiliary disciplines ofstudy.

PLO-E. Display ethical code of conduct in usage of Internet and Cybersystems.

PLO-F. Ability to pursue higher studies of specialization and to take up technical employment.

PLO-G. Ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.

PLO-H. Ability to operate, manage, deploy, configure computer network, hardware, software operation of anorganization.

PLO-I. Ability to present result using different presentation tools.

PLO-J. Ability to appreciate emerging technologiesand tools.

6 Teaching-Learning Process

The teaching-learning process should be in-line with the course objective and outcomes. Teaching has to ensure that the suggested outcomes are ensured for each course and overall programme. Teaching-aids should be used wherever required to facilitate proper and impactful learning. Blended learning is recommended with the use of MOOC platforms and classroom teaching. To meet the set objectives of the course and enable students achieve the expected outcomes of the course the teaching-learning process should be appropriately chosen. Though the teachers are best positioned to create innovative models suitable for teaching the course, certain well accepted and widely tested processes are suggested to achieve the desired outcomes

6.1 Classroom Teaching - Regular classroom and face to face teaching and tutorials can be primarily used for imparting theoretical foundations of Computer Science. Applications of the same may be explained from time to time so that the student can appreciate the theory.

6.2 Laboratory - Lab exercises in programming and usage of package / software tools should be made mandatory and integral part. Open source software/Packages should be preferred over proprietary tools wherever available.

6.3 Seminars - Guest lectures and seminars involving industry experts and eminent teachers should be arranged to help the students understand the practices in the industry and developments in the field.

6.4 Moocs - Teacher should choose appropriate lecture materials and videos on similar courses available online through Massive Open Courses Online in the world wide web (such as NPTEL) to provide good perspective of the course and usecases and promote blended learning.

6.5 Project - Wherever possible the laboratory assignments can be designed in the form of a mini project. For example, the database course lab assignments can be designed to build a complete system for library management. Similarly, summer/ Semester breaks can be utilized for guiding students to develop live projects with industry orientation/ industry problem. Teamwork work should be encouraged,

Assignments - Home assignments should be designed to make student collect information from various sources and solve unfamiliar problems and make comparisons of solutions

Major Project - The major project should be defined based on the student proposals keeping in mind that opportunity to demonstrate the knowledge and skills gained during the course. One-One mentoring support should be provided.

7 .Assessment Methods

The committee recommends that assessment should be viewed not only merely as a testing by the institution to evaluate the students' progress, but also as a valuable tool for a student to learn what is expected of him/her, where their level of knowledge and skill is lacking, and perhaps most importantly, what he/she could do to improve these levels with the valuable inputs of the lecturers. Assessment methods are the strategies, techniques, tools and instruments for collecting information to determine the extent to which students demonstrate desired learning outcomes.

In the Bachelor’s programmes leading to degrees such as BSc with Computer Science , the assessment and evaluation methods focus on testing the conceptual understanding of the basic ideas of computer hardware and software, development of programming skills and experimental techniques, retention and ability to apply the knowledge acquired to real-life applications, and to solve new problems and communicate the results and findings effectively.

Based on the Learning Objectives defined for each course as proposed in detail, assessment methods can be designed to monitor the progress in achieving the Learning Objectives during the course and test the level of achievement at the end of the course. Several methods can be used to assess student learning outcomes. Relying on only one method to provide information about the program will only reflect a part of students’ achievement.

Modular Assessment As the courses are broken up into a smaller more cohesive learning outcomes a module will consist of a number of these smaller, finer grained assessments of which the majority can be considered to be formative assessments that aid the learning process rather than assessments aimed at solely being used to evaluate the student. Continuous Assessment The continuous assessment occurs on a regular and continuous basis, it is an ongoing formative and summative process, involves the monitoring of students, is integrated with teaching, involves a systematic collection of marks or grades into a final score, may be used to determine the students’ final grades.

Direct methods of assessment ask students to demonstrate their learning while indirect methods ask students to reflect on their learning. Tests, essays, presentations, etc. are generally direct 86methods of assessment, and indirect methods include surveys and interviews. For each Learning Objective, a combination of direct and indirect assessment methods should be used.

Formative Assessment While formative assessment is to gather feedback from formal or informal processes that can be used by the instructor and the students to gather evidence for the purpose of improving learning, summative assessment measures the level of success or proficiency that has been obtained at the end of an instructional unit, by comparing it against some standard or benchmark. Nevertheless, the outcome of a summative assessment can be used formatively when students or faculty use the results to guide their efforts and activities in subsequent courses.

Daily programming assignments or home-assignments is a good way of implementing formative assessment and gives an idea of how well the students understood and could apply each programming concept. Another way of formative assessment can be that at the end of each class period, a student response system can be used to ask students one or more questions about the topic taught on that day. Regular tutorial Assignment, Term-paper, Seminar Presentation, Surprise Quizzes, Open-book Quizzes should be adopted for formative assessments.

M.Sc. INFORMATION TECHNOLOGY CURRICULUM

Total number of Credits: 90

Category	**Code No**	**Course**	**Hours/Week**				**Maximum Marks**		
			Lecture	**Tutorial**	**Practical**	**Credits**	**CA**	**SEE**	**Total**
SEMESTER I									

Core	21CMIT11	Programming in C++	4	0	0	4	40	60	100
Core	21CMIT12	Data Structures	4	0	0	4	40	60	100
Core	21CMIT13	Open Source Technologies	4	0	0	4	40	60	100
Core	21PMIT11	Programming in C++ Lab	0	0	4	2	40	60	100
Core	21PMIT12	Open Source Technologies Lab	0	0	4	2	40	60	100
DSE	21DMIT11	DSE 1	4	0	0	4	40	60	100
DSE	21DMIT12	DSE 2	3	0	0	3	40	60	100
SEC		Soft Skill1/Sector Skill Course	2	0	0	2	40	60	100
			21	**0**	**8**	**25**			
SEMESTER II									
Core	21CMITS21	Advanced DBMS	4	0	0	4	40	60	100
Core	21CMIT22	Programming in JAVA	4	0	0	4	40	60	100
Core	21CMIT23	Data Communication & Networks	4	0	0	4	40	60	100
Core	21PMIT21	Advanced DBMS Lab	0	0	4	2	40	60	100
Core	21PMIT22	Programming in JAVA Lab	0	0	4	2	40	60	100
DSE	21DMIT21	DSE 3	3	0	0	3	40	60	100
SI		Internship	0	0	4	2	40	60	100
SEC		Soft Skill2/ Sector Skill Course	2	0	0	2	40	60	100
			17	**0**	**12**	**23**			
SEMESTER III									
Core	21CMIT31	Operating System	4	0	0	4	40	60	100
Core	21CMIT32	Deep Learning	4	0	0	4	40	60	100
Core	21CMIT33	R Programming	4	0	0	4	40	60	100
Core	21PMIT31	R Programming Lab	0	0	4	2	40	60	100
Core	21PMIT31	Mini Project	0	0	4	2	40	60	100

DSE	21DMIT31	DSE 4	3	0	0	3	40	60	100
DSE	21DMIT32	DSE 5	3	0	0	3	40	60	100
SEC		Soft Skill 3/ Sector Skill Course	2	0	0	2	40	60	100
			20	**0**	**8**	**24**			
SEMESTER IV									
Core	21DMIT41	Internet of Things	4	0	0	4	40	60	100
GE	21GMIT41	Generic Elective-I	4	0	0	4	40	60	100
Core	21PMIT41	Project Work	0	0	20	10	40	60	100
			8	**0**	**20**	**18**			

DISCIPLINE SPECIFIC ELECTIVES (DSE)

DSE – 1	Software Engineering Artificial Intelligence Scripting Languages
DSE – 2	Data Mining & Data Warehousing Mobile Computing Parallel and Distributed Computing System
DSE -3	Natural Language Processing Compiler Design

DSE – 4	Neural Networks
	Block Chain Technology Design & Analysis of Algorithms Security Issues in Machine Learning
DSE – 5	Big Data Analytics Cloud Computing Computational Intelligence

GENERIC ELECTIVE COURSES

GE	ERP Systems
	Internet Basics
	Advanced Excel

SKILL ENHANCEMENT COURSE

SEC	Soft-Skill –I
	Soft-Skill –II
	Soft-Skill –III

CORE SYLLABUS

21CMIT11	**PROGRAMMING USING**	**C++**	**4**	**0**	**0**	**4**

COURSE OBJECTIVE

- This course introduces the basic concepts of programming in C++.
- To improve problem solving skills using OOPS concept.
- To make a good programmer, to write code, make the code work, and fix the number of bugs for develop employable skills

UNIT I INTRODUCTION 12

Introduction to OOP – features of OOP - Advantages of OOP – Structures – Unions – Classes – Private member function - Public member function- Friend Function - Inline Function – Static Variables – Static Function- Scope Resolution Operator – Passing objects to functions – function Retuning objects.

UNIT II ARRAYS & POINTERS 12

Arrays – Pointers – this pointer - References – Dynamic memory Allocation – Polymorphism- functions Overloading – Ambiguity in function overloading- Default argument – Pointer to Functions – Pointers to Array- Array of Pointers- Constructors – Default constructor- Parameterized Constructor- Copy Constructor- Dynamic Constructor- Constructor Overloading – Destructors.

UNIT III OVERLOADING & POLYMORPHISM 12

Operator Overloading – Member Operator Function – Friend Operator Function – Overloading some special operator like [], (), and comma operator – Inheritance – Types of Inheritance – Protected members – Runtime Polymorphism - Virtual base Class – Virtual functions – Pure Virtual functions.

UNIT IV EXCEPTION HANDLING 12

Class templates and generic classes – Functions templates and generic functions – Overloading a function templates – Exception Handling – Derived class Exception – over handling generic function – Exception handling Function – terminate(), unexpected(), Uncaught – exception().

UNIT V STREAMS 12

Streams – Formations I/O with ios class functions and manipulators – creating own manipulators – overloading << and >> - file I/O – Name Spaces – Conversion functions – Standard Template Library (STL)

Total No of Hours: 60

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1:Articulate the principles of object-oriented problem solving and programming.

CO2:Outline the essential features and elements of the C++ programming language.

CO3:Analyze the role and understand the importance of building reusable code and I/O operations.

CO4:Understand how to handle the error using exception handling.

CO5:Understand dynamic memory management techniques using pointers, constructors, destructors, etc.

CO6:Able to evolve application development ability for employability.

Text Books:

1. BalaGuruSamy.E, “Programming with C++”, TMH, India, 2006**.**
2. Herbert Schildt, “C++ - The complete reference”, Third Edition – Tata McGraw Hill –, 4th Edition, 2002.

Reference Books:

1. Yashwant Kanetkar- “Let us C++” – 2nd Edition- McGraw Hill – 2000.
2. Maria Litvin and Gary Litvin “ C++ for you++”, Vikas Publ, 2002.
3. John R Hubbard: “Programming with C++”, TMH Publ. II Edition, 2004.

Website Link:

1. **www.w3schools.com**
2. **www.tutorialspoint.com**

Web Source:

1. https://www.tutorialspoint.com/cplusplus/cpp_tutorial.pdf.
2. https://www.bcanotes.com/cpp-programs/

21CMIT12	DATA STRUCTURE	4	0	0	4

COURSE OBJECTIVE

- This subject deals with the methods of data structures.
- On successful completion of this subject, the students evolve in various concept which is helpful in employability:
  - ○ Writing programming using data structures concepts
  - ○ Dealing with Stacks, Queues, List,
  - ○ Algorithms etc.,

UNIT I INTRODUCTION 13

Definition of a Data Structure – Primitive and Composite data types, Asymptotic notations – Arrays – operations on arrays – ordered list.

UNIT II STACK 13

Stacks –Application of stack – Infix to postfix conversion, Recursion, queues – operation on Queue , Queue application ,circular queues.

UNIT III LINKED LIST 12

Singly linked list –Operation, Application –representation of a polynomial, polynomial addition, doubly linked list-Operation.

UNIT IV TREES AND GRAPHS 12

Trees and Graphs: Binary Trees –Operation, tree traversals – Graph Implementation –Definition, Types of graph, Traversal– Shortest Path Problems, Dijikstra's algorithm.

UNIT V ALGORITHM 10

Algorithm-Definition-examples-Complexity-Divide and Conquer- Binary search -Maximum and Minimum-Merge sort.

Total Hours: 60

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1:Develops skills in implementations and applications of data structures.

CO2:Ability to describe stack, queue and linked list operation.

CO3:Ability to have knowledge of tree and graphs concepts.

CO4:Apply various algorithm development techniques and build their own algorithms.

CO5:Identify the Importance of various types of linked lists

CO6: Understand the concept of data structure to develop the skills for employability.

Text Books:

1. E. Horowitz, S. Sahni and Mehta – "Fundamentals of Data Structures in C++" - 2ndEdition, Universities Press – 2008.
2. Horowitz, S.Shani, and S.Rajasekaran, "computer algorithms", golgotia pub. Ltd., 2000.

Reference Books:

1. E Balagurusamy: Programming in ANSI C, Tata McGraw-Hill, 1998.
2. Ellis Horowitz & Sartaj Sahni: Fundamentals of Data Structure, Galgotia Book Source, 2000.

3. Data structure using C – Aaron M Tanenbaum, Yedidyeh langsam, Moshe J Augenstein, PHI Pub

Website Link:

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javatpoint.com

Web source Link:

1. https://www.geeksforgeeks.org/data-structures/

21CMIT13	OPEN SOURCE TECHNOLOGIES	4	0	0	4

OBJECTIVE: To provide knowledge about Open Source Technologies and to help in understanding the programming aspects of Personal Home Page PHP & Python. This course provide the high possibility of employability based on the concepts.

UNIT I INTRODUCTION **13**

Introduction to Open Sources – Need of Open Sources – Advantages of Open Sources– Application of Open Sources - Open Source Operating Systems: LINUX: Introduction – General Overview – Kernel Mode and User Mode- Development with Linux.

UNIT II PHP **12**

Introduction – Basic features of PHP – Evolution of PHP — Introducing Variables – Holding Data – Constants – Introducing Operators. Control Structures – Using Conditional Statements – Using Loops in PHP .

UNIT III PHP –FUNCTIONS AND ARRAYS **13**

Introduction to Functions – Using Functions. Introducing Arrays – Create Arrays – Looping through Arrays – Manipulating Arrays – Sorting Arrays

UNIT 1V WORKING WITH DATA **12**

Testing and Debugging – Debugging PHP script – Debugging and handling errors in PHP5 –Retrieving data using PHP – SQL statement for retrieving Data – Inserting records using PHP – Updating and Deleting Records in tables.

UNIT V PYTHON **10**

Basic syntax, variable type, operators, Decision making, Loops, Strings, Lists, Function, Modules, Files I/O,Exceptions**.**

Total Hours : 60

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1:Ability to build and modify one or more Free and Open Source Software packages.

CO2:Create database in Ms sql server

CO3:Design dynamic and interactive web pages by embedding Java Script code in HTML.

CO4:To understand open source scripting language for programming in web environment i.e. PHP.

CO5:Various controls and components in PHP used to develop the employable skills.

TEXTBOOK:

1. Remy card , Eric Dumas & Frank Mevel,―The Linux Kernel Book‖,Wiley Publications,2003. (Unit I) ..

2. Rasmus Lerdorf & Levin Tatroe, ― Programming PHP ‖, O'Reilly, 2002(Unit II ,III & IV)

3. Wesley J.chun , ― Core Phython Programming ‖, Prentice Hall, 2001(Unit IV)

REFERENCES:

1. Steven Holzner, ―PHP: The Complete Reference‖, 2 nd Edition, Tata MCGraw Hill, Indian Reprint 2009.

Website Link:

1. www.javapoint.com
2. www.geeksforgeeks.org
3. www.w3schools.com
4. www.tutorialspoint.com

Web source:

1. https://www.tutorialspoint.com/basics_of_computers/basics_of_computers_open_source_software.htm.

2. https://www.w3schools.com//python.
3. https://www.w3schools.com/php/
4. https://www.w3schools.com/mysql/

21PMIT12 PROGRAMMING IN C++ LAB 0 0 4 2

COURSE OBJECTIVE

- To improve problem solving skills using OOPS concept.
- To make a good programmer, to write code, make the code work,
- To fix the number of bugs to develop the skills of programming.

LIST OF EXPERIMENTS:

1. Write a C++ program to demonstrate Control Structures
2. Write a C++ program to calculate Simple interest using class and Object
3. Write a C++ program to sort given numbers in Ascending Order using Bubble sort
4. Write a C++ program to manipulate a given string
5. Write a C++ program to demonstrate function overloading
6. Write a C++ program to demonstrate Inline function
7. Write a C++ program to demonstrate Friend function
8. Write a C++ program to demonstrate Default Arguments
9. Write a C++ program to demonstrate Constructor
10. Write a C++ program to demonstrate Operator Overloading
11. Write a C++ program to demonstrate Single Inheritance
12. Write a C++ program to demonstrate Multi level Inheritance
13. Write a C++ program to demonstrate Multiple Inheritance
14. Write a C++ program to demonstrate virtual function
15. Write a C++ program to demonstrate pure virtual function

Total No of Hours : 30 Hrs

COURSE OUTCOMES:

On Completion of this course, the students can able to

CO1: Develop the Virtual Functions and File handling operations

CO2: Write C++ Programs using Classes & objects.

CO3: Build programs on Constructors, Destructors and Overloading concepts using programs.

CO4: Manipulate the role of inheritance in building reusable code and I/O operations.

CO5:.State the OOP's concepts in writing simple C++ Programs.

CO6: Discuss and develop the skills of programming.

TEXT BOOKS:

1. E.BalaGurusamy "Object Oriented Programming with C++", Tata MC Graw Hill Education.
2. YashwantKanetkar-"Let Us C++", 2nd edition,McGraw HillEducation,2000.

REFERENCE BOOKS:

1. Herbert Schildt "The Complete Reference C++", 4th edition,McGraw Hill Education,2017
2. D.Ravichandran-"Oriented Programming with C++", 2nd edition, TMH.

WEBSITES

1.www.w3schools.com

2.www.tutorialspoint.com

3.www.javapoint.com

4. www.geeksforgeeks.org

WEB SOURCES

1. https://www.tutorialspoint.com/cplusplus/cpp_tutorial.pdf
2. https://www.cplusplus.com/files/tutorial.pdf
3. https://www.slideshare.net/aloknie/oop-cclassfinalppt
4. https://www.slideshare.net/adisesha12/basic-concept-of-oops
5. https://www.slideserve.com/joan-craft/object-oriented-programming-with-c

21PMIT12 OPEN SOURCE TECHNOLOGIES LAB 0 0 4 2

OBJECTIVE: To provide practical experience in software development using open source tools like Python, PHP and MySQL**.** To develop the concept debugging and develop the skills for programming.

EXERCISES

1. Program to Demonstrate String Functions using PHP.
2. Program to Demonstrate Session using PHP.
3. Program to Create a File and write the Data into it using PHP.
4. Application for Email Registration and Login using PHP and MySQL.
5. Program to check the given number is Prime or not using Python.
6. Program to perform the String Operation using Python.
7. Program to perform Functions in Lists using Python.
8. Program to copy content of one file to another file Using Exception Handling using Python.

Total Hours: 30

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1:Create applications using PHP

CO2: Create web pages using HTML, DHTML and Cascading Styles sheets

CO3:Analyze and apply the role of languages like HTML, DHTML

CO4:Analyze and build web applications using PHP with Ms-sql server

CO5:Develop the skills of dynamic web pages using PHP

Website Link:

1. https://www.javatpoint.com/php-programs
2. https://www.javatpoint.com/python-programs.
3. https://www.datacamp.com/community/tutorials/mysql-python

21CMIT21	**ADVANCED DBMS**	**4**	**0**	**0**	**4**

Course Objective

This course aims to give students in depth information about system implementation techniques, data storage, representing data elements, database system architecture, the system catalog, query optimization, centralized DB concepts, Normalization, distributed databases and client server architecture, advanced database concepts. To equip students to get employability in data base administration.This course provide the high possibility of employability based on the concepts.

UNIT-1 COMPARISON BETWEEN DIFFERENT DATABASES 12

Significance of Databases, Database System Applications, Advantages and Disadvantages of different Database Management systems, Comparison between DBMS, RDBMS, Distributed and Centralized DB.

UNIT-II RDBMS 13

Relational Query Languages, The SQL Query Language, Querying Multiple Relations, Creating Relations in SQL, Destroying and Altering Relations, Adding and Deleting Tuples, Integrity Constraints (ICs), Primary and Candidate Keys in SQL, Foreign Keys, Referential Integrity in SQL, Enforcing Referential Integrity.

UNIT- III CATEGORIES OF SQL COMMANDS 12

Data Definition, Data Manipulation Statements: SELECT - The Basic Form Subqueries, Functions, GROUP BY Feature, Updating the Database, Data Definition Facilities, Views, Embedded SQL *, Declaring Variables and Exceptions, Embedding SQL Statements, Transaction Processing, Consistency and Isolation, Atomicity and Durability, Dynamic SQL.

UNIT-IV NORMALIZATION 13

Functional Dependency, Anomalies in a Database, The normalization process: Conversion to first normal form, Conversion to second normal form, Conversion to third normal form, The boyce-code normal form(BCNF), Fourth Normal form and fifth normal form, normalization and database design, Denormalization

UNIT-V QUERY OPTIMIZATION 10

Algorithm for Executing Query Operations: External sorting, Select operation, Join operation, PROJECT and set operation, Aggregate operations, Outer join, Heuristics in Query Optimization, Semantic Query Optimization, Converting Query Tree to Query Evaluation Plan, multi query optimization and application, Efficient and extensible algorithms for multi-query optimization, execution strategies for SQL sub queries, Query Processing for SQL Updates.

Total : 60 Hours

Course Outcome:

At the End of this course, the Student will be able to:

CO-1: Evaluate hierarchy of DBMS.

CO-2: Analyze different types of SQL statement.

CO-3: Apply normalization in the database &amp; understand the internal data structure.

CO-4: Understand the transaction system &amp; could extract data efficiently.

CO-5: Understand the notion of transaction and its ACID properties

CO-6: Understand the DBMS concept for employability as database programmer or database tester.

Text Books:

1. Date C. J, “An Introduction to Database Systems”, Addison Wesley Longman, 8th

Edition, 2003.

2. Catell, R.G.G., Barry, D.K., Berler, M., et al, “The Object Data Standard: ODMG

3.0”, Morgan Kaufmann,2000.

3. Silberschatz A., Korth H., and Sudarshan S, “Database System Concepts”,

McGraw- Hill, 6th Edition, 2010.

Reference Books:

1. Charles F. Goldfarb, Paul Prescod, “The XML Handbook, Prentice Hall”, 5th

Edition, 2004.

2. Thomas M. Connolly, Carolyn Begg, “Database Systems: Practical approach to

Design, Implementation and Management”, Pearson Education Limited, 6th

edition,2012.

Web Sources:

1. www.oracle-tutorial.com

2. www.studytonight.com

21CMIT22	**PROGRAMMING IN JAVA**	**4**	**0**	**0**	**4**

COURSE OBJECTIVE

- This course is to develop programming skills in Java.
- It will focus on more sophisticated features such as design of classes, interfaces, packages and APIs.
- To design and implementation of both graphical applets and standalone applications.

- This course provide the high possibility of employability based on the concepts.
-

UNIT I INTRODUCTION 13

Introduction to Java – Features of Java – Object Oriented Concepts – Lexical issues – Data Types – Variables – Arrays – Operators – Control Statements. Classes – Objects – Constructors – Overloading methods – Access control – Static and fixed methods – inner class – string Class – Inheritance – Overriding methods – using super – Abstract class- Dynamic Method Dispatch- using Final.

UNIT II PACKAGES 13

Packages – Access Protection – Importing packages – Interfaces – extending an Interface- Exception Handling – Try catch, Nested Try, Multicatch Statements, Throw, Throws and finally – Exception Classes – user defined exception- Thread – states of a Thread- Thread methods-creation using Thread class- creation using Runnable Interface – Synchronization – Thread Priorities- Multithreading. - Inter thread communication- Deadlock .

UNIT III STREAMS 12

I/O Streams – File Streams – Applets – String Class– Methods in String class-String Buffer class– Methods in String Buffer class – Java Util Package – Java Lang Package- Wrapper classes- Collection classes

UNIT IV NETWORK 12

Network basics – sockets – IP Address- Proxy servers-ports- InetAddress- Factory methods-Socket classes- Datagrams-TCP/IP sockets-URL – URL Connection – Working with windows ,colors and Fonts-Event Handling- AWT Controls – Layout Manager-Menus.

UNIT V SERVLETS 10

Servlets – Environment and role – Architectural role for servlets – Servlet classes- GenericServlet-HttpServlet-doGet(),doHead(),dopost()-HTML support – Installing servlets – servlets API – servlet life cycle - HTML to servlet communication.

Total Hours: 60

COURSE OUTCOME

On Completion of this course, the students can able to

CO1: Design Applet programs using AWT classes and utilize Controls and Layout Managers

CO2: Evaluate java program to solve specified problems and use Java SDK

Environment to create, debug and run simple java programs

CO3: Develop the Java Classes make use of Constructors and Inheritance

CO4: Analyze the packages and classify the thread communication

CO5: Describe java features and explain the supporting OOPs concepts

TEXT BOOKS

1. Cay S.Horstmann, Gary Cornell-Core Java 2 Volume 1 – Fundamentals,5th PHI,2000.

2. Java The complete reference, 8th editon, Herbert Schildt, TMH

REFERENCE BOOKS

1. P.Naughton and H.Schildt –Java2 (The Complete References)-Seventh Edition,TMH 2004.
2. K.Arnold and J.Gosling- The Java Programming Language – Second Edition,Addison Wesley,2002.

WEB SITES

1. www.javapoint.com
2. www.geeksforgeeks.org
3. www.w3schools.com
4. www.tutorialspoint.com

WEB SOURCES

1. https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf
2. https://www.tutorialspoint.com/java/java_tutorial.pdf
3. https://www.slideshare.net/intelligotech/java-tutorial-ppt-7189933

21CMIT23 DATA COMMUNICATION & NETWORKS 4 0 0 4

COURSE OBJECTIVE

- To understand the basic concepts of data communication, layered model, protocols and interworking between computer networks and switching components in telecommunication systems for employability.
- To provide the high Reliability
- To educate the student in modern networking technologies.

UNIT I : INTRODUCTION 13

Introduction, Fundamental concepts: Characteristics – Components of Data communications, Data flow, Computer Network: Definition - Network criteria - Categories of Network, Distributed processing, Protocol, Standards, Standard organizations.

UNIT II: NETWORK MODELS 12

The OSI reference model, peer-to-peer processes, Functions of the layers in the OSI model, TCP/IP protocol suite.

UNIT III: MEDIA AND TRANSMISSION MODES 13

Transmission mode, Digital data transmission, DTE/DCE interface, Modems, Guided Media and Unguided Media.

UNIT IV: NETWORK TOPOLOGIES 12

Line Configuration, computer network topologies, Types of errors, Error Detection, Error Corrections**.**

UNIT V: SWITCHING AND ROUTING 10

Multiplexing, Types of Multiplexing, Switching - Circuit Switching - Packet Switching - Message switching , Networking and Internetworking devices , Routing and routing algorithm types.

Total No of Hours: 60

COURSE OUTCOMES:

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

CO1: Understand basic computer network technologies and protocols.

CO2: Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each

layer.

CO3: Understand the rudiments of how computers communicate and their functions within a network

CO4: Identify the different types of network topologies.

CO5: Understand the basic aspects of packet-based design and implementation and familiar

with modern communication systems**.**

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TEXT BOOK

1. Behrouz and Forouzan - Introduction to Data Communication and Networking - 2 nd

Edition - TMH-2005.

REFERENCE BOOKS:

1. Jean Walrand 1998,Communication Networks (A first Course), Second Edition,

WCB/McGraw Hill.

2. Behrouz and Forouzan,2006,Data Communication and Networking, 3 rd Edition , TMH.

WEBSITES

1. www.w3schools.com

2. www.tutorialspoint.com

3. www.javapoint.com

4. www.geeksforgeeks.org

WEB SOURCES

1.http://www.engppt.com/2009/12/networking-fourozan-ppt-slides.html

2.https://www.vssut.ac.in/lecture_notes/lecture1428550521.pdf

3.http://www.indoreindira.com/UG/images/BCA/BCA%20IV%20%20Notes/BCA%20IV%20PDF/BCA%20IV%20sem%20Data%20&amp;%20Network%20Communication.pdf

4.https://mrcet.com/downloads/digital_notes/ECE/III%20Year/DATA%20COMMUNICATIONS.pdf

21PMIT21 ADVANCED DBMS LAB 0 0 4 2

COURSE OBJECTIVE

- This course gives training in design and implementation of data bases for the selected problems.
- The objective of this lab course is to understand the practical skill applicability of database management system concepts.
- To deploy data-processing oriented framework skills
- The lab course also provide practical skill knowledge to understand advanced database concepts such as Data mining and Big Data Analysis.

1.Learning basic DDL, DML, DCL and TCLcommands

2. Working with dualtable.

3. Use of Joins and Subqueries.

4. Views, sequences andindexes.

5. Managing users, privileges androles.

6. PL/SQL-Data types, controlstructures.

7. Creating procedures with PL/SQL.

8. Error handling in PL/SQL.

9. Cursor Management in PL/SQL.

10. Writing Programs on Packages &amp;triggers.

11. Embedding PL/SQL in high levellanguage.

12. Implementation of Triggers &amp; Assertions for BankDatabase.

Total: 30 Hours

Course Outcomes:

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

CO-1: Create an application to check user defined exception using PL/SQL.

CO-2: Evaluate the functionalities of trigger and cursor.

CO-3: Analyze different types of built-in function in PL/SQL.

CO-4: Apply DDL, DML and DCL statement using SQL.

CO-5: Apply various types of joins in tables.

WEB SOURCES:

1. www.guru99.com/dbms-tutorial.html

2. www.oracletutorial.com

21PMIT22 PROGRAMMING IN JAVA LAB 0 0 4 2

COURSE OBJECTIVE

- This course gives practical skill training in java programming
- It will focus on more sophisticated features such as design of skills via classes, interfaces, packages and APIs.
- Provide the foundation of good programming skills by discussing keys issues to the design of object-oriented software.

APPLICATIONS

1. Finding area and perimeter of a circle. Use buffered reader class.
2. Sub string removal from a string. Use string buffer class.
3. Determining the order of numbers generate randomly using random class.
4. Implementing of point class for image manipulation.
5. Usage of calendar class and manipulation
6. String manipulation using char array.
7. Database creation for storing e-mail addresses and manipulation.
8. Usage of vectors classes.
9. Implementing threads based application & exception handling.
10. Application using synchronization such as thread based, class based and synchronized statements.

APPLETS

1. Working with frames and various controls.
2. Working with dialogs and menus.
3. Working with panels and layout.
4. Incorporating graphics.
5. Working with colors and fonts.

Total Hours: 30

COURSE OUTCOME

On Completion of this course, the students can able to

CO1: Build Applet programs using AWT classes and utilize Controls and Layout Managers

CO2: Write a computer program to solve specified problems and use Java SDK

Environment to create, debug and run simple java programs

CO3: Develop the Java Classes make use of Constructors and Inheritance

CO4: Develop the packages and classify the thread communication

CO5: Develop simple java application using java features and OOPs concepts.

WEB SOURCES

1. https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf
2. https://www.tutorialspoint.com/java/java_tutorial.pdf
3. https://www.slideshare.net/intelligotech/java-tutorial-ppt-7189933

21CMIT31 OPERATING SYSTEM 4 0 0 4

COURSE OBJECTIVE

- Study the basic concepts and functions of operating systems.
- Understand the structure and functions of OS.
- Learn about Processes, Threads and Scheduling algorithms.
- Understand the principles of concurrency and Deadlocks.
- Learn various memory management schemes.
- Study I/O management and File systems.

UNIT I OPERATING SYSTEMS OVERVIEW 13

Computer System Overview-Basic Elements, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor and Multicore Organization. Operating system overview-objectives and functions, Evolution of Operating System.- Computer System Organization- Operating System Structure and Operations- System Calls, System Programs, OS Generation and System Boot.

UNIT II PROCESS MANAGEMENT 13

Processes-Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication; Threads- Overview, Multicore Programming, Multithreading Models; Windows 7 – Thread and SMP Management. Process Synchronization – Critical Section Problem, Mutex Locks, Semophores, Monitors; CPU Scheduling and Deadlocks.

UNIT III STORAGE MANAGEMENT 12

Main Memory-Contiguous Memory Allocation, Segmentation, Paging, 32 and 64 bit architecture Examples; Virtual Memory- Demand Paging, Page Replacement, Allocation, Thrashing; Allocating Kernel Memory, OS Examples.

UNIT IV I/O SYSTEMS 12

Mass Storage Structure- Overview, Disk Scheduling and Management; File System Storage-File Concepts, Directory and Disk Structure, Sharing and Protection; File System Implementation- File System Structure, Directory Structure, Allocation Methods, Free Space Management, I/O Systems.

UNIT V CASE STUDY 10

Linux System- Basic Concepts; System Administration

Total Hours: 60

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1:Compare and analyze the scheduling algorithms.

CO2:Examine resource management techniques.

CO3:Apply the methods for Handling Dead locks.

CO4:Understand and identify the functions of operating system.

CO5: Define and state the operating system concepts.

TEXT BOOKS:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Concepts" 9th Edition, John Wiley, 2013
2. Deitel H.M. "An Introduction to Operating System", Addison Wesley Publishing Co., 2003

REFERENCE BOOKS

1. William Stallings, "Operating Systems – Internals and Design Principles", 7th Edition, Prentice Hall, 2011.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Addison Wesley, 2001.
3. Charles Crowley, "Operating Systems: A Design-Oriented Approach", Tata McGraw HillEducation", 1996.

WEBSITES

1. https://www.studytonight.com/operating-system
2. https://www.geeksforgeeks.org/operating-systems
3. https://www.tutorialspoint.com/operating_system/index.html
4. https://www.javatpoint.com/os-tutorial
5. https://ubuntu.com/tutorials/command-line-for-beginners
6. https://www.guru99.com/unix-linux-tutorial.html

WEB SOURCES

1. https://examupdates.in/operating-system-pdf
2. https://www.cl.cam.ac.uk/teaching/1011/OpSystems/os1a-slides.pdf
3. https://www.unf.edu/public/cop4610/ree/Notes/PPT/PPT8E/CH%2002%20-OS8e.pdf

4. https://www.tutorialspoint.com/operating_system/operating_system_tutorial.pdf
5. https://www.guru99.com/linux-tutorial-pdf.html
6. **https://www.tutorialspoint.com/unix/unix-pdf-version.htm**

21CMIT32 DEEP LEARNING 4 0 0 4

COURSE OBJECTIVES

To understand the major technology trends driving Deep Learning and apply fully connected deep neural networks. This course is used to analyse the key parameters and hyper parameters in a neural network&#39;s architecture.

UNIT I PROBABILITY AND INFORMATION THEORY 13

Random Variables- Probability Distributions- Marginal Probability- Conditional Probability- Expectation- Variance and Covariance- Bayes' Rule-Information Theory - Numerical Computation- Overflow and Underflow- Gradient-BasedOptimization- Constrained Optimization- Linear Least Squares.

UNIT II MACHINE LEARNING BASICS 13

Machine Learning Basics and under fitting, Hyper parameters and Validation Sets Estimators- Bayesian Statistics- Supervised and Unsupervised Learning-Stochastic Gradient Descent- Challenges Motivating Deep Learning. Deep Feed forward Networks: Learning XOR- Gradient-Based Learning- Hidden Units-Architecture Design- Back- Propagation and other Differentiation Algorithms.

UNIT III REGULARIZATION FOR DEEP LEARNING 12

Regularization for Deep Learning: Parameter Norm Penalties- Norm Penalties as Constrained Optimization- Regularization and Under-Constrained Problems- Dataset Augmentation- Noise Robustness- Semi-Supervised Learning- Multi-Task Learning- Optimization for Training Deep Models: Pure Optimization- Challenges in Neural Network Optimization- Basic Algorithms- Algorithms with Adaptive Learning Rates- Optimization Strategies and Meta-Algorithms.

UNIT IV CONVOLUTIONAL NETWORKS 12

Convolutional Networks: The Convolution Operation, Pooling- Convolution- Basic Convolution Functions -Structured Outputs, Data Types -Efficient Convolution Algorithms- Random or Unsupervised Features -Basis for Convolutional Networks.

UNIT V SEQUENCE MODELLING 10

Sequence Modeling: Recurrent and Recursive Nets- Unfolding Computational Graphs- Recurrent Neural Networks- Bidirectional RNNs-Deep Recurrent Networks - Recursive Neural Networks- Echo State Networks- LSTM –Gated RNNs- Optimization for Long- Term Dependencies.

Total : 60 hours

COURSE OUTCOMES:

At the End of this course, the Student will be able to:

CO-1: Analyze mathematical foundation of neural network.

CO-2: Apply Efficient Convolution Algorithms.

CO-3: Understand the Concept of Convolutional Networks.

CO-4: Understand about Information theory.

CO-5: Understand Supervised and Unsupervised Learning.

TEXT BOOKS:

1. Ian Goodfellow, Yoshua Bengio, Aaron Courville, “Deep Learning”, MIT Press,2016.

2. Josh Patterson and Adam Gibson, “Deep learning: A practitioner&#39;s approach”, O&#39;Reilly Media, First Edition, 2017.

REFERENCE BOOKS:

1. Nikhil Buduma, O’Reilly, Fundamentals of Deep Learning, Designing next-generation machine intelligence algorithms, Shroff Publishers, 2019.

2. Douwe Osinga, O’Reilly,Deep learning Cook Book, Practical recipes to get started Quickly, Shroff Publishers, 2019.

WEB SOURCES:

1. https://keras.io/datasets/

2. http://deeplearning.net/tutorial/deeplearning.pdf

3. https://arxiv.org/pdf/1404.7828v4.pdf

21CMIT33 R PROGRAMMING 4 0 0 4

OBJECTIVES

- To understand the basic concepts of R , Controls statements , functions and arrays
- To analyze various data structures and their functions
- To gain the knowledge of R Functions, Packages and Files

UNIT – I INTRODCTION 12

Introduction to R: Overview of R programming, Evolution of R, Applications of R program

UNIT – II OPERATORS DATA TYPES 12

Basic Concepts of R: Reserved Words, Variables & Constants Operators, Operator Precedence, Data Types , Input and Output.

UNIT – III CONTROL STRUCTUER 12

Data structures in R: Vectors, Matrix, List in R programming Data Frame, Factor . Control flow: If...else, If else() Function, Programming for loop While Loop, Break & next, Repeat Loop

UNIT – IV FUNCTIONS 12

Functions: R Functions, Function Return Value, Environment & Scope, R Recursive Function, R Infix Operator, R Switch Function. Strings: String construction rules, String Manipulation functions

UNIT – V PACKAGES 12

R packages: Study of different packages in R - R Data Reshaping: Joining Columns and Rows in a Data Frame Merging Data Frames, Melting and Casting - Working with files: Read and writing into different types of files

Total Hours: 60

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1:Develop joining of columns and rows in a data frame and merging data frames.

CO2:Examine and analyze the importance of R Functions, Packages and Files

CO3:Use R Functions, Packages and Files

CO4:Describe the fundamental concepts and applications of R Language

CO5:Define the basic concepts of R language

TEXT BOOKS:

1. The Art of R Programming-a tour of statistical software design by Norman Matloff

2. R Cookbook: Proven Recipes for Data Analysis, Statistics, and Graphics (O'Reilly Cookbooks) by Paul Teetor

3. R in Action Book by Rob Kabacoff, John Mount , Jim Porzak

REFERENCE BOOKS:

1. Hadley Wickham, Garrett Grolemund, " R for data science : Import, Tidy, Transform, Visualize, And Model Data".
2. Richard Cotton "Learning R: A Step-by-Step Function Guide to Data Analysis"

WEBSITES:

1. https://www.tutorialspoint.com/r/index.htm
2. https://www.guru99.com/r-programming-introduction-basics.html
3. https://www.datacamp.com/tracks/r-programming

WEB SOURCES:

1. https://www.tutorialspoint.com/r/r_tutorial.pdf
2. https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf
3. https://www.stats.ox.ac.uk/~evans/Rprog/LectureNotes.pdf
4. https://www.guru99.com/r-programming-tutorial-pdf.html

21PMIT31 R PROGRAMMING LAB 0 0 4 2

OBJECTIVE: Handling the data using R tool.

EXERCISES

1. Assignments on Basic Concepts of R

2. Assignments on Data structures in R

3. Assignments on Control flow

4. Assignments on Functions

5. Assignments on R packages, R Data Reshaping

6. Assignments on Working with files, R object and Class

7. Assignments on Data visualization in R and Data Management

8. Assignments on Statistical modelling and Databases in R

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1:Get a solid foundation in R programming concepts

CO2:Collect, analyze and interpret quantitative data

CO3: Create and edit visualizations with R

CO4: Access online resources for R and import new function packages into the R workspace

CO5: Import, review, manipulate and summarize data-sets in R

TEXT BOOKS:

1. The Art of R Programming-a tour of statistical software design by Norman Matloff

2. R Cookbook: Proven Recipes for Data Analysis, Statistics, and Graphics (O'Reilly Cookbooks) by Paul Teetor

3. R in Action Book by Rob Kabacoff, John Mount , Jim Porzak

REFERENCE BOOKS:

3. Hadley Wickham, Garrett Grolemund, “ R for data science : Import, Tidy, Transform, Visualize, And Model Data”.
4. Richard Cotton “Learning R: A Step-by-Step Function Guide to Data Analysis”

WEBSITES:

1. https://www.tutorialspoint.com/r/index.htm
2. https://www.guru99.com/r-programming-introduction-basics.html
3. https://www.datacamp.com/tracks/r-programming

WEB SOURCES:

5. https://www.tutorialspoint.com/r/r_tutorial.pdf
6. https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf
7. https://www.stats.ox.ac.uk/~evans/Rprog/LectureNotes.pdf
8. https://www.guru99.com/r-programming-tutorial-pdf.html

DISCIPLINE SPECIFIC ELECTIVE

DSE-I

21DMIT11	**SOFTWARE ENGINEERING**	**4**	**0**	**0**	**4**

COURSE OBJECTIVE:

- Be employed in industry, government, or entrepreneurial endeavors to demonstrate professional advancement through significant technical achievements and expanded leadership responsibility.

- Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment.

- Progress through advanced degree or certificate programs in computing, science, engineering, business, and other professionally related fields.

- Improve employability in business application and computer games.

UNIT I INTRODUCTION 12

Introduction to Software Engineering: Definitions – Size Factors- Quality and Productivity Factors – Managerial Issues- Planning a software Project: Defining the Problem – Developing a Solution – Strategy – Planning the Development Process – Planning an Organization Structure – Other Planning Activities.

UNIT II SOFTWARE COST ESTIMATION 12

Software cost factors – Software Cost Estimation Techniques – Staffing – Level Estimation Estimating Software Maintenance Costs – The Software Requirements Specification – Formal Specification Techniques – Languages and Processors for Requirements Specification.

UNIT III SOFTWARE DESIGN: 12

Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real-Time and Distributed System Design – Test Plans – Milestones, Walkthroughs, and Inspections.

UNIT IV IMPLEMENTATION ISSUES: 12

Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation guidelines – Type checking – Scooping Rules – Concurrency Mechanism.

UNIT V QUALITY ASSURANCE 12

Quality Assurance – Walkthroughs and Inspections – Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing – Formal Verification: Enhancing Maintainability during Development – Managerial aspects of Software Maintenance – Source Code Metrics – Other

Maintenance Tools and Techniques.

Total No of Hours : 60

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1: Describe key activities in software development and the role of modelling

CO2: Describe the basics of an object-oriented approach to software development

CO3: Explain key concepts in software development such as risk and quality

CO4: Identify, formulate and solve complex engineering problems by applying principles of software Engineering

CO5: To function effectively on a team whose members together provide leadership, create a collaborative and Inclusive environment, establish goals, plan tasks, and meet objectives

CO6 : To develop the employable skills for business application and computer games

TEXT BOOK

1. R. S. Pressman, 2005, Software Engineering a Practitioner's approach, 6th Edition, Tata McGraw-Hill, New Delhi.

REFERENCE BOOKS

1. Sommerville, 2001, Software Engineering, 6th Edition, Addison Wesley, Boston.
2. Rajib Mal, 2005, -Fundamental of Software engineering, 2 ND Edition, PHI, New Delhi.
3. N. E. Fenton, S. L. Pfleenger, 2004, Software Metrics, Thomson Asia, Singapore.

WEBSITES

7. **www.w3schools.com**
8. **www.tutorialspoint.com**
9. **www.geeksforgeeks.org**

WEB SOURCES

7. **https://lecturenotes.in/notes/1594-note-for-software-engineering-se-by-sushri-rout**
8. **https://nptel.ac.in/courses/106/105/106105087/**
9. **https://www.tutorialsduniya.com/notes/software-engineering-notes/**

DSE-I

21DMIT11	**ARTIFICIAL INTELLIGENCE**	**4**	**0**	**0**	**4**

COURSE OBJECTIVE:

- To familiarize students with Artificial Intelligence techniques for building well-engineered and efficient intelligent systems.
- Pattern-directed inference systems and different types of truth maintenance systems will be discussed in length from both theoretical and applied point of view.

- Some cutting edge applications of these systems will also be discussed. Introduction to Artificial Intelligence Programming using LISP will be provided to help students with the programming part of the course.

UNITI INTRODUCTION 12

Artificial Intelligence Definition – Importance of Artificial Intelligence – Knowledge based Systems – Knowledge Representation – State space search – Production systems – Artificial Intelligence Programming Language – PROLOG – Heuristic search - Depth First Breadth first – Hill climbing – 4th algorithms – Game Playing.

UNITII KNOWLEDGE REPRESENTATION 12

Prepositional Logic – Clause form – Predicate logic – Resolution – Inference Rules – Unification – Semantic networks – frames – conceptual dependency – Scripts – Representing Knowledge using rules.

UNIT III SYMBOLIC REASONING AND UNCERTAINTY 12

Non monotonic Reasoning – Truth maintenance systems – closed world assumption – modal and temporal Logics – Bayes Theorem - certainty factors – Bayesian networks – Dempster – Shafer Theory – Fuzzy logic.

UNIT IV NATURAL LAGUAGE PROCESSING 12

Overview of Linguistics – grammars and Languages – Basic parsing techniques – semantic Analysis and representation structures – Natural language generation – natural language systems – Distributed Reasoning systems – Intelligent agents.

UNIT V EXPERT SYSTEMS 12

Architecture – Non production systems Architectures – Knowledge acquisition and validation – Knowledge system building tools – Types of Learning – General Learning model – Learning by induction – Generalization and specialization – Inductive bias – Explanation based Learning.

Total No of Hours: 60

TEXT BOOKS

1. Dan W. Patterson, “Introduction to Artificial Intelligence and Expert Systems”, Prentice Hall of India, Delhi, 2001.

2. Elaine Rich and Kevin Knight, “Artificial Intelligence” Tata McGraw Hill Pub. Co., Delhi, 2001.

REFERENCE BOOK

1. George F Luger, “Artificial Intelligence, structures and strategies for complex problem solving”, Pearson Education Delhi, 2001

WEBSITES

1. **www.w3schools.com**
2. **www.tutorialspoint.com**
3. **www.geeksforgeeks.org**

WEB SOURCES

1. **https://lecturenotes.in/subject/128/artificial-intelligence-ai**
2. **https://www.vssut.ac.in/lecture_notes/lecture1428643004.pdf**
3. **https://epub.uni-regensburg.de/13629/1/ubr06078_ocr.pdf**

DSE-I

21DMIT11 SCRIPTING LANGUAGES 4 0 0 4

Course Objective:

- Student will understand Scripting languages and its purposes.
- The course will cover theoretical aspects of the subject with suitable programs through scheduled lectures.
- The course will cover the Client Side and Server Side Scripting Languages.

UNIT I HTML 12

Internet Basics- Introduction to Scripting Languages- Client Side and Server Side Scripting Languages- - Introduction to HTML - List - Creating Table - Linking document - Frames - Graphics to HTML Doc - Style sheet - Style sheet basic - Add style to document - Creating Style sheet rules - Style sheet properties - Font - Text - List - Color and background color - Box - Display properties.

UNIT II VB SCRIPT 12

Introduction to VBScript - Adding VBScript Code to an HTML Page - VB Script Basics - VBScript Data Types - VBScript Variables - VBScript Constants -VBScript Operators – mathematical- comparison-logical - Using Conditional Statements - Looping Through Code - VBScript Procedures – type casting variables - math functions – date functions – string functions – other functions - VBScript Coding Conventions - Dictionary Object in VBScript - Err Object

UNIT IIIJAVA SCRIPT12

Introduction to Javascript – Advantages of Javascript – Javascript syntax - Data type –Variable - Array – Operator & Expression – Looping – control structures - Constructor Function – user defined function Dialog Box .

UNIT IV PERL 12

Introduction to PERL and Scripting Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

UNIT V CGI 12

CGI and Scripting languages: Introduction to CGI, Alternative Technologies, The Hypertext Transport Protocol, URLs, HTTP, Browser Requests, Server Responses, Proxies, Content Negotiation, The Common Gateway Interface, The CGI Environment, Environment Variables, CGI Output, Forms and CGI, Sending Data to the Server.

Total No of Hours: 60

COURSE OUTCOME:

At the end of this course the students will be able to,
CO1: Apply basic principles of Scripting Algorithms.
CO2: Design web pages with the help of html
CO3: Demonstrate foundations and history of CGI
CO4: Demonstrate PERL, VBScript, Java Script.
CO5: Design interactive web page for the application.

TEXT BOOKS

1. The Self-Taught Programmer: The Definitive Guide to Programming Professionally by Cory Althoff
2. JavaScript for Kids: A Playful Introduction to Programming by Nick Morga

REFERENCE BOOK

1. Clean Code: A Handbook of Agile Software Craftsmanship by Robert C. Martin

WEBSITES

1. **www.w3schools.com**
2. **www.tutorialspoint.com**
3. **www.geeksforgeeks.org**

WEB SOURCES

1. **https://www.jbiet.edu.in/coursefiles/cse/HO/cse4/SL1.pdf**
2. **https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_SL_Lecture_Notes.pdf**
3. **http://www.cs.stir.ac.uk/courses/CSC9Y4/lectures/scripting1a.pdf**

DSE-II

21DMIT12	**DATA MINING & DATA WAREHOUSING**	**3**	**0**	**0**	**3**

COURSE OBJECTIVE:

- Learn about data mining functionalities, applications and issues.
- Demonstrate the data mining classification and clustering analysis.
- To understand the components and benefits of data ware housing for employability as data analyst or scientist

UNIT I INTRODUCTION 9

Data mining – Functionalities – Knowledge Discovery Process- Applications of Data mining– Issues in Data mining -Classification of Data mining- Tasks Primitives- Data Preprocessing- Cleaning, Reduction, Transformation.

UNIT 2 CLASSIFICATION AND PREDICTION 9

Classification: Introduction to Classification-Issues Regarding Classification and Prediction-Classification by Decision Tree Induction- Rule based Classification-Support Vector Machine-Other Classification Methods-Prediction: Introduction- Regression Analysis.

UNIT 3 CLUSTERING ANALYSIS, ASSOCIATION MINING, TEXT MINING 9

Introduction- Applications of Cluster Analysis- Requirements of Clustering in Data Mining-Categorization of Major Clustering Methods- Partitioning Methods-Hierarchical Methods-Association Rule Mining-Text Mining-Web Mining.

UNIT 4 DATA WAREHOUSING 9

Data warehousing Components- Benefits of data Warehousing-Operational and informational Data-Data Warehouse Characteristics- Data Warehouse Architecture and its components- Benefits of data warehousing- Mapping the data warehouse architecture to Multiprocessor architecture.

UNIT 5ON-LINE ANALYTICAL PROCESSING (OLAP) and Data Mining Tool 9

OLAP-Introduction-Need for OLAP- Categories of OLAP Tools- OLAP Tools and the Internet- List of tools for Data Mining.

Total No of Hours 45

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1: Analyze different classification & clustering techniques

CO2: Can able to understand steps involved in data mining.

CO3: Understand the basic functionalities & issues of data mining

CO4: Understand the basic components & benefits of Data Warehousing.

CO5: Understand the concept of OLAP tools

CO6 : Able to get employability in Data warehouse engineer.

TEXT BOOKS

1.Jiawei Han and MichelineKamber, “Data Mining Concepts and Techniques”, Third Edition, Elsevier, 2012.

2.Alex Berson and Stephen J.Smith, ―Data Warehousing, Data Mining & OLAP‖, Tata McGraw – Hill Edition, 35th Reprint 2016

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com

3. www.geeksforgeeks.org

WEB SOURCES

1. https://lecturenotes.in/subject/32/data-mining-and-data-warehousing-dmdw/note
2. https://www.smartzworld.com/notes/data-warehousing-and-data-mining-pdf-notes-dwdm/

DSE-III

21DMIT12	MOBILE COMPUTING	3	0	0	3

COURSE OBJECTIVE

- To learn the basics of Wireless voice and data communications technologies.
- To build working knowledge on various telephone and satellite networks.
- To study the working principles of wireless LAN and its standards.
- To build knowledge on various Mobile Computing algorithms.
- To build skills in working with Wireless application Protocols to develop mobile content applications.

UNIT I INTRODUCTION 9

Introduction, issues in mobile computing, overview of wireless telephony: cellular concept, GSM: air-interface, channel structure, location management: HLR-VLR, hierarchical, handoffs, channel allocation in cellular systems, CDMA, GPRS.

UNIT II WIRELESS NETWORKING 9

Wireless Networking, Wireless LAN Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP, WAP: Architecture, protocol stack, application environment, applications.

UNIT III DATA MANAGEMENT ISSUES 9

Data management issues, data replication for mobile computers, adaptive clustering for mobile wireless networks, File system, Disconnected operations.

UNIT IV MOBILE AGENTS COMPUTING 9

Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment.

UNIT V AD HOC NETWORKS 9

Ad Hoc networks, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, applications.

Total No of hours 45

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1: Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless Networks.

CO2: Demonstrate basic skills for cellular networks design.

CO2: Explain the concepts of Mobile Agents computing, security and fault tolerance

CO4: Get thorough knowledge of Ad Hoc Networks, Routing Protocols

CO5: Understand fundamentals of wireless communications.

TEXT BOOK:

1. J. Schiller, “Mobile Communications”, Addison Wesley, 2002

REFERENCE BOOKS:

1. Mehrotra ,” GSM System Engineering”.,2003
2. M. V. D. Heijden, M. Taylor, “Understanding WAP”, Artech House, 2004.
3. Charles Perkins, “Mobile IP”, Addison Wesley, 2002.
4. Charles Perkins, Ad hoc Networks, Addison Wesley,2003.

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2. **www.tutorialspoint.com**
3. **www.geeksforgeeks.org**

WEB SOURCES

1. **https://lecturenotes.in/notes/10134-notes-for-mobile-computing-mc-by-annapurna-mishra**
2. **https://www.smartzworld.com/notes/mobile-computing-pdf-notes-mc-notes-pdf/**
3. **https://examupdates.in/mobile-computing-pdf/**

DSE-II

21DMIT12 PARALLEL AND DISTRIBUTED COMPUTING SYSTEM

3 0 0 3

Course Objective:

- To learn parallel and distributed algorithm development techniques for shared memory and message passing models,
- To study the main classes of parallel algorithms
- To study the complexity and correctness models for parallel algorithms.

UNIT I INTRODUCTION 9

Basic Techniques - Parallel Computers for Increase Computation Speed - Parallel &Cluster Computing

UNIT IIPARALLEL PROGRAMS 9

Message Passing Technique - Evaluating Parallel Programs and Debugging - Portioning AndDivide And Conquer Strategies Examples

UNIT III PIPELININGTECHNIQUES 9

Pipelining - Techniques Computing Platform - Pipeline Programs Examples.

UNIT IV SHARED MEMORY 9

Synchronous Computations - Load Balancing - Distributed Termination Examples - Programming With Shared Memory - Shared Memory Multiprocessor Constructs For Specifying Parallel List - Sharing Data Parallel Programming Languages And Constructs - OpenMP.

UNITVDISTRIBUTED SHARED MEMORYSYSTEMS 9

Distributed Shared Memory Systems And Programming Achieving Constant Memory Distributed Shared Memory Programming Primitive - Algorithms – Sorting And Numerical Algorithms.

Total No of Hours 45

COURSE OUTCOME:

At the End of this course, the Student will be able to:

CO-1: Evaluate concepts of Parallel computing systems.

CO-2: Analyze about Cluster Computing systems.

CO-3: Apply Message Passing Technique.

CO-4: Apply Parallel programs and debugging.

CO-5: Understand Pipelining Techniques and examples.

TEXT BOOKS:

1. Barry Wilkinson, Michael Allen, "Parallel Programming", Pearson Education, 2nd Edition.
2. Jaja, "Introduction to Parallel algorithms", Pearson,1992.

REFERENCE BOOK:

1. Calvin Lin, Larry Snyder, "Principles of Parallel Programming", Addison-Wesley, 2008.

WEB SOURCES:

1. www.coursere.org
2. www.nptel.ac.in

DSE - III

21DMIT21 NATURAL LANGUAGE PROCESSING 3 0 0 3

COURSE OBJECTIVE

- The Course provides the models, methods, and algorithms of statistical Natural Language Processing (NLP) for common NLP tasks, such as speech recognition, machine translation, spam filtering, text classification and spell checking.

UNITIOVERVIEW AND LANGUAGEMODELING 9

Overview - Origins and challenges of NLP-Language and Grammar-Processing Indian Languages - NLP Applications-Information Retrieval - Language Modeling: Various Grammar - based Language Models - Statistical Language Model.

UNIT II WORD LEVEL ANDSYNTACTIC ANALYSIS9

Word Level Analysis - Regular Expressions - Finite-State Automata - Morphological Parsing - Spelling Error Detection and correction - Words and Word classes - Part-of Speech Tagging. Syntactic Analysis – Context - free Grammar - Constituency - Parsing - ProbabilisticParsing.

UNIT III SEMANTIC ANALYSIS ANDDISCOURSE PROCESSING9

Semantic Analysis - Meaning Representation - Lexical Semantics – Ambiguity - Word Sense Disambiguation - Discourse Processing – cohesion - Reference Resolution - Discourse Coherence and Structure.

UNIT IV NATURAL LANGUAGE GENERATION 9

Natural Language Generation - Architecture of NLG Systems - Generation Tasks and Representations - Application of NLG. Machine Translation - Problems in Machine Translation - Characteristics of Indian Languages - Machine Translation Approaches - Translation involving Indian Languages.

UNIT VINFORMATION RETRIEVAL ANDLEXICALRESOURCES9

Information Retrieval - Design features of Information Retrieval Systems – Classical - Non-classical - Alternative Models of Information Retrieval – valuation Lexical Resources: World Net - Frame Net - Stemmers - POS Tagger - ResearchCorpora.

Total No of Hours 45

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1: Build models using Hidden Markov models and probabilistic context-free grammars, Clustering and unsupervised methods, log-linear and discriminative models, and the EM Algorithm.

CO2: Explain discourse, generation, dialogue and summarization within NLP.

CO3: Get clear idea of machine learning techniques used in NLP

CO4: Understand approaches to syntax and semantics in NLP.

CO5: Understand current methods for statistical approaches to machine translation.

TEXT BOOKS:

1. Tanveer Siddiqui, U.S. Tiwary, "Natural Language Processing and Information Retrieval", Oxford University Press, 2008.

REFERENCE BOOKS:

1. Daniel Jurafsky and James H Martin, "Speech and Language Processing: An introduction to Natural Language Processing, Computational Linguistics and Speech Recognition", 2nd Edition, Prentice Hall,2008.

James Allen, "Natural Language Understanding", 2nd edition, Benjamin /Cummings publishing company

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1. www.w3schools.com

2. www.tutorialspoint.com
3. www.geeksforgeeks.org

WEB SOURCES

1. https://lecturenotes.in/subject/371/natural-language-processing-nlp
2. https://www.cl.cam.ac.uk/teaching/2002/NatLangProc/nlp1-4.pdf

DSE - III

21DMIT21	**COMPILER DESIGN**	**3**	**0**	**0**	**3**

COURSE OBJECTIVE:

- This course introduces the basic concepts and applications of complier design.

- To understand, design and implement a parser.
- To understand, design code generation schemes.

UNIT 1 INTRODUCTION TO COMPLIERS 9

Compliers and Translator– Need of Translator – The structure of a Complier – Lexical analysis – Syntax analysis – Intermediate code generation – optimization – code generation – Complier – writing tools. Finite automata and lexical Analysis: The role of the lexical analysis – A simple approach to the design of lexical analyzersRegular expressions to finite automata – Minimizing the number of state s of a DFA.

UNIT 2 SYNTACTIC SPECIFICATION OF PROGRAMMING LANGUAGES9

Context free grammars – derivations and parse trees – capabilities of context free gram mars. Basic parsing techniques: Parsers – shift – reduce parsing – operator – precedence parsing – top down parsing – predictive parsers – automatic construction of efficient parsers: LR parsers – the canonical collection of LR (o) items constructing SLR parsing tables – constructing canonical LR parsing tables.

UNIT 3 SYNTAX – DIRECTED TRANSLATION 9

Syntax – directed translation schemes – Implementation of syntax – directed translators – intermediate code – postfix notation – parse trees and syntax trees – 3 address code – quadruples and triples – translation of assignment statements – Boolean expressions – statements that alter the flow of control. Symbol tables: the contents of a symbol table – data structures for symbol table – representing scope information.

UNIT 4 RUN TIME STORAGE ADMINISTRATION: 9

Implementation of a simple stack allocation Scheme – implementation of blockstructured languages – storage allocation in block structured languages. Error deduction and recovery: errors – lexical phase errors – syntactic phase errors – semantic errors.

UNIT 5 INTRODUCTION OF CODE OPTIMIZATION 9

The principle sources of optimization – loop optimization – the DAG representation of basic blocks – value numbers and algebraic laws – Global data flow analysis. Code generation: Object programs – problems in code generation – a machine model – a simple code generator – register allocation and assignment – code generation from DAG’s – peepholes optimization.

Total No of Hours 45

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1:Apply for various optimization techniques for dataflow analysis

CO2:Construct the intermediate code representations and generation

CO3:Convert source code for a novel language into machine code for a novel computer

CO4:Get clear knowledge of Context free grammars, derivations and parse trees and basic parsing techniques

CO5:Understand the major phases of compilation and to have thorough knowledge of Lexical and syntax analysis

TEXT BOOK

1. Alfred V.Aho, Jeffrey D.Ullman "Principles of Complier Design" by , Narosa Pub House.2007.

REFERENCE BOOK

1. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
2. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.
3. J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill, 2003.

WEBSITES

1. **www.w3schools.com**
2. **www.tutorialspoint.com**
3. **www.geeksforgeeks.org**

WEB SOURCES

1. **https://lecturenotes.in/subject/67/compiler-design**
2. **https://www.vssut.ac.in/lecture_notes/lecture1422914957.pdf**
3. **https://www.freebookcentre.net/ComputerScience-Books-Download/Compiler-Design-Lecture-Notes.html**

DSE - III

21DMIT21	**NEURAL NETWORKS**	**3**	**0**	**0**	**3**

COURSE OBJECTIVES:

- Provide an understanding of the basic mathematical elements of the theory of fuzzy sets.
- Provide an emphasis on the differences and similarities between fuzzy sets and classical sets theories.
- Explain the concepts of neural networks, fuzzy logic, and genetic algorithms.

UNIT 1 BASIC LEARNING ALGORITHMS 9

Biological Neuron – Artificial Neural Model - Types of activation functions – Architecture:Feedforward and Feedback – Learning Process: Error Correction Learning – Memory Based Learning – Hebbian Learning – Competitive Learning - Boltzman Learning – Supervised and Unsupervised Learning – Learning Tasks: Pattern Space – Weight Space – Pattern Association – Pattern Recognition – Function Approximation – Control – Filtering - Beamforming – Memory – Adaptation - Statistical Learning Theory – Single Layer Perceptron – Perceptron Learning Algorithm – Perceptron Convergence Theorem – Least Mean Square Learning Algorithm – Multilayer Perceptron – Back Propagation Algorithm – XOR problem – Limitations of Back PropagationAlgorithm.

UNIT II RADIAL-BASIS FUNCTION NETWORKS AND SUPPORT VECTOR MACHINES RADIAL BASIS FUNCTION NETWORKS 9

Cover's Theorem on the Separability of Patterns - Exact Interpolator – Regularization Theory – Generalized Radial Basis Function Networks - Learning in Radial Basis Function Networks Applications: XOR Problem – Image Classification. **SUPPORT VECTOR MACHINES*:*** Optimal Hyperplane for Linearly Separable Patterns and Nonseparable Patterns – Support Vector - insensitive Loss Function – Support Vector Machine for Pattern Recognition – XOR Problem - Machines for Nonlinear Regression

UNIT III COMMITTEE MACHINES AND NEURO DYNAMICS SYSTEMS 9

Ensemble Averaging - Boosting – Associative Gaussian Mixture Model – Hierarchical Mixture of Experts Model(HME) – Model Selection using a Standard Decision Tree – A Priori and Postpriori Probabilities – Maximum Likelihood Estimation – Learning Strategies for the HME Model – EMAlgorithm – Applications of EM Algorithm to HME Model - Dynamical Systems – Attractors and Stability – Non-linear Dynamical Systems- Lyapunov Stability – Neurodynamical Systems – The Cohen-GrossbergTheorem.

UNIT IV ATTRACTORNEURALNETWORKS *9*

Associative Learning – Attractor Neural Network Associative Memory – Linear Associative Memory – Hopfield Network – Content Addressable Memory – Strange Attractors and Chaos- Error Performance of Hopfield Networks - Applications of Hopfield Networks – Simulated

Annealing – Boltzmann Machine – Bidirectional Associative Memory – BAM Stability Analysis – Error Correction in BAMs - Memory Annihilation of Structured Maps in BAMS – Continuous BAMs – Adaptive BAMs –Applications

UNIT V SELF ORGANISING MAPS AND PULSEDNEURONMODELS9

Self-Organizing Map – Maximal Eigenvector Filtering – Sanger's Rule – Generalized Learning Law – Competitive Learning - Vector Quantization – Mexican Hat Networks - Self-organizing Feature Maps – Applications - Spiking Neuron Model – Integrate-and-Fire Neurons – Conductance Based Models – Computing with SpikingNeurons.

Total No of Hours 45

COURSE OUTCOMES:

At the End of this course, the Student will be able to:

CO-1: Evaluate the Architecture of different neural networks.

CO-2: Analyze wide variety of learning algorithms.

CO-3: Apply supervised learning.

CO-4: Understand about unsupervised learning.

CO-5: Understanding limitations of various learning algorithms.

TEXT BOOKS:

1. NunesDaSilvaI,ArtificialNeuralNetworksAPracticalCourse",SPRINGER,ISBN-9783319431611,January, 2017

REFERENCE BOOKS:

1. Satish Kumar, "Neural Networks: A Classroom Approach", Tata McGraw-Hill Publishing Company Limited, New Delhi,2004.
2. Simon Haykin, "Neural Networks: A Comprehensive Foundation", 2ed., Addison Wesley Longman (Singapore) Private Limited, Delhi,2001.

WEB SOURCES:

1. www.edureka.com
2. www.coursera.org

DSE IV

21DMIT31 BLOCK CHAIN TECHNOLOGY 3 0 0 3

COURSE OBJECTIVE:

● This course covers the technical aspects of public distributed ledgers, block chain systems, crypto currencies, and smart contracts.

● Students will learn how these systems are built, how to interact with them, how to design and build secure distributed applications.

UNIT-I BLOCKCHAIN BASICS 9

Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete. Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof positions.

UNIT-II INTRODUCTIONTOBLOCKCHAIN 9

Introduction, Advantage over conventional distributed database, Block chain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, ChainPolicy, Life of Block chain application, Soft & Hard Fork, Private and Public block chain.

UNIT-III DISTRIBUTED CONSENSUSANDCRYPTOCURRENCY 9

Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate. History, Distributed Ledger, Bit coin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Side chain, Name coin.

UNIT-IV CRYPTOCURRENCYREGULATION 12

Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Block chain.

UNITV CASE STUDYONBLOCKCHAIN 9

Case study on Naive Block chain construction, Memory Hard algorithm – Hash cash implementation, Direct Acyclic Graph, Play with Go-ethereum, Smart Contract Construction, Toy application using Block chain, Mining puzzles

Total No of Hours 45

COURSE OUTCOMES:

At the End of this course, the Student will be able to:

CO-1: Evaluate a method for solving a problem case study with different perspective

CO-2: Analyze limitations and proofs are another essential part of block chain

technologies, which are learned for betterment of creating block chain.

CO-3: Apply latest crypto currency aspects leads students to understand

some of basic concepts of Black Market and Global Economy

CO-4: Understand block chain technologies basics

CO-5: Describing the history behind the block chain and learning about Vulnerability,

Attacks and Side chain gives an additional support for creating a secured block chain.

TEXT BOOK:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19,2016).

REFERENCE BOOKS:

1. Draft version of “S. Shukla, M. Dhawan, S. Sharma, S. Venkatesan, ‘Blockchain Technology: Crypto currency and Applications’, Oxford University Press,2019.
2. Josh Thompson, ‘Block chain: The Block chain for Beginnings, Guild to Block chainTechnology and Block chain Programming’, Create Space Independent Publishing Platform,2017.

WEB SOURCES:

1. https://www.blockchainexpert.uk/book/blockchain-book.pdf
2. https://users.cs.fiu.edu/~prabakar/cen5079/Common/textbooks/Mastering_Blockchain_2nd Edition. pdf
3. https://www.gsb.stanford.edu/sites/gsb/files/publication-pdf/study-blockchain-impact-moving-beyond-hype_0.pdf

DSE - IV

21DMIT31 DESIGN & ANALYSIS OF ALGORITHMS 3 0 0 3

COURSE OBJECTIVE

- To provide a solid foundation in algorithm design and analysis.
- To help the student learn the outcomes, include Basic knowledge of graph and matching algorithms.
- To analyze asymptotic runtime complexity of algorithms including formulating recurrence relations.
- To understand basic knowledge of computational complexity, approximation and randomized algorithms.

UNIT I INTRODUCTION 9

Introduction-Definition of algorithms-Pseudo code conventions-recursive algorithms-time and space complexity-big "Oh" notation-practical complexities- Randomized algorithms-Repeated element-primality testing- Divide and conquer : General method-Finding maximum and minimum-Merge sort.

UNIT II GREEDY METHODS 9

Divide and conquer contd.–Quick sort –selection sort- – Strassen's matrix multiplication – Greedy method:General method –Knapsack problem—tree vertex splitting—Job sequencing with dead lines—optimal storage on tapes.

UNIT III DYNAMIC PROGRAMMING 9

Dynamic programming: multi stage graph-all pairs shortest paths-single source shortest paths-string editing-0/1 knapsack problem-search techniques for graphs-DFS,BFS-connected components-Biconnected components.General method-

UNIT IV BACK TRACKING 9

Backtracking: General method – 8-Queens problem – sum of subsets-graph coloringHamiltonian cycles–Branch and bound: General method– Knapsack problem – Traveling salesman problem.

UNIT V LOWER BOUND THEORY 9

Lower Bound theory: comparision trees-Oracle and adversary arguments- Lower Bound through reduction- basic concepts of NP hard and NP-complete problems.

Total No of Hours 45

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1: Compare and Contrast various algorithm development techniques and design their own Algorithms

CO2: Compare greedy technique and backtracking techniques

CO3: Explain Fast Fourier Transform and Theory of NP-completeness

CO4: Identify the importance of Divide and conquer technique

CO5: Utilize the idea of greedy method to solve the greedy algorithms

Text Book:

1. Thomas H. Coreman, Charles E. Leiserson and Ronald L. Rivest, "Introduction to Algorithms", Printice Hall of India, 2002.

Reference Books:

1. RCT Lee, SS Tseng, RC Chang and YT Tsai, "Introduction to the Design and Analysis of Algorithms", Mc Graw Hill, 2005.
2. E. Horowitz & S Sahni, "Fundamentals of Computer Algorithms", 2006.
3. Aho, Hopcraft, Ullman, "The Design and Analysis of Computer Algorithms" Pearson Education, 2008.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.geeksforgeeks.org

WEB SOURCES

1. https://lecturenotes.in/notes/17784-note-for-design-and-analysis-of-algorithm-daa-by-shekharesh-barik
2. http://cs.uef.fi/pages/franti/asa/notes.html f

DSE – IV

21DMIT31 SECURITY ISSUES IN MACHINE LEARNING 3 0 0 3

COURSE OBJECTIVE

- To provide a solid foundation in Security issues and analysis.
- To help the student learn the outcomes, include Basic knowledge of issues in machine learning and matching security algorithms.

UNIT I INTRODUCTION TO MACHINE LEARNING 9

Overview of Machine learning concepts – Over fitting and train/test splits, Types of Machine learning – Supervised, Unsupervised, Reinforced learning, Introduction to Bayes Theorem, Linear Regression- model assumptions, regularization (lasso, ridge, elastic net)

UNIT II CLASSIFICATION AND REGRESSION ALGORITHMS 9

Classification and Regression algorithms- Naïve Bayes, K-Nearest Neighbors, logistic regression, support vector machines (SVM), decision trees, and random forest, Classification Errors, Analysis of Time Series- Linear Systems Analysis, Nonlinear Dynamics, Rule Induction, Neural NetworksLearningAnd Generalization, Overview of DeepLearning.

UNIT III SECURITYIN MACHINE LEARNING 9

Security Vulnerabilities in Machine Learning Algorithms, Evasion Attacks (Adversarial Inputs), Data Poisoning Attacks, Model Stealing Techniques, Possible Solutions to Ensure Machine Learning Security

UNIT IV ADVANCED LEARNING 9

Sampling-Basic Sampling methods, Monte Carlo, Gibbs Sampling – Computational Learning Theory – Mistake Bound Analysis – Reinforcement learning – Markov Decision processes, Deterministic and Non- deterministic Rewards and Actions, Temporal Difference LearningExploration.

UNIT V CASE STUDY 9

Possible case studies: Machine learning for intrusion detection, Machine learning for side channel analysis, Privacy preserving machine learning, Adversarial machine learning.

TotalNo of Hours: 45

COURSE OUTCOMES:

At the End of this course, the Student will be able to:

CO-1: Evaluate concepts of machine learning.

CO-2: Analyze appreciate supervised and unsupervised learning and their applications

CO-3: Analyze security issues in machine learning.

CO-4: Understand the analysis of time series and overview of deep learning.

CO-5: Understand the security issues in machine learning.

TEXT BOOKS:

1. Christopher Bishop, "Pattern Recognition and Machine Learning" Springer,2007.
2. KevinP.Murphy,"MachineLearning:AProbabilisticPerspective",MITPress,2012.
3. EthemAlpaydin,"IntroductiontoMachineLearning",MITPress,ThirdEdition,2014.

Tom Mitchell, "Machine Learning", McGraw-Hill,1997.

REFERENCE BOOKS:

1. Trevor Hastie, Robert Tibshirani, Jerome Friedman, "The Elements of Statistical Learning", Springer, Second Edition,2011.
2. Stephen Marsland, "Machine Learning - An Algorithmic Perspective", Chapman and Hall/CRC Press, Second Edition,2014.

WEB SOURCES:

1. www.analyticsvidhya.com/blog/2018/07/using-power-deep-learning-cyber-security/
2. www.simplilearn.com/how-ai-and-machine-learning-impact-cyber-security-article

DSE - V

21DMIT32 BIG DATA ANALYTICS 3 0 0 3

COURSE OBJECTIVE:

- To explore, design, and implement basic concepts of big data & analytics methodologies for analyzing structured and unstructured data with emphasis on the relationship between the Data Scientist and its application to the business needs.

UNIT I INTRODUCTION TO BIG DATA 9

Introduction to Big Data Platform – Challenges of Conventional Systems - Nature of Data- Evolution Of Analytic Scalability - Intelligent data analysis- Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools

UNIT II MINING DATA STREAMS 9

Introduction to Streams Concepts – Stream Data Model and Architecture - Stream Computing -Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Real Time Analytics Platform (RTAP) Applications

UNIT III ADVANCED ANALYTICS 9

Analyzing, Visualization and Exploring the Data, Statistics for Model Building and Evaluation, Advanced Analytics - K-means clustering, Association rules-Speedup, Linear Regression, Logistic Regression, Naïve Bayes, Decision Trees, Time Series Analysis, Text Analysis.

UNIT IV HADOOP 9

History of Hadoop- The Hadoop Distributed File System – Components of Hadoop - Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming

UNIT V FRAMEWORKS 9

Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

Total No of Hours 45

COURSE OUTCOME:

At the End of this course, the Student will be able to:

CO-1: Evaluate Big Data real time analytics platform applications.

CO-2: Analyze big data platform and learn intelligent data analysis and compare old and modern data analytic tool.

CO-3: Apply advanced analytics techniques to gain knowledge of latest techniques.

CO-4: Understand the data streams concepts and stream computing.

CO-5: Understand the fundamental concepts of big data platform and know about the basic concepts of nature and evolution of big data.

TEXT BOOK:

1. Prajapati, Big Data Analytics with R and Hadoop, 2014

REFERENCE BOOK:

1. Stephan Kudyba, Big Data, Mining, and Analytics: Components of Strategic Decision Making,Auerbach Publications, March 12, 2014.
2. Michael Minelli (Author), Michele Chambers (Author), AmbigaDhiraj (Author), BigData, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses, Wiley Publications, 2013

WEB SOURCES:

1. www.intellipaat.com/blog/big-data-tutorial-for-beginners/
2. www.simplilearn.com/tutorials/data-analytics-tutorial

DSE - V

21DMIT32	**CLOUD COMPUTING**	**3**	**0**	**0**	**3**

COURSE OBJECTIVE

- To understand the concept of cloud and utility computing
- To understand the various issues in cloud computing
- To familiarize themselves with the lead players in cloud
- To appreciate the emergence of cloud as the next generation computing paradigm
- To be able to set up a private cloud

UNIT I INTRODUCTION 9

Evolution of Cloud Computing –System Models for Distributed and Cloud Computing–NIST Cloud Computing Reference Architecture -IaaS–On-demand Provisioning -Elasticity inCloud –E.g.of IaaS Providers -PaaS –E.g.of PaaS Providers –SaaS –E.g. of SaaS Providers–Public , Private and Hybrid Clouds.

UNIT II VIRTUALIZATION 9

Basics of Virtualization -Types of Virtualization -Implementation Levels of Virtualization -Virtualization Structures -Tools and Mechanisms -Virtualization ofCPU, Memory, I/O Devices -Desktop Virtualization –Server Virtualization.

UNIT III CLOUD INFRASTRUCTURE 9

Architectural Design of Compute and Storage Clouds –Layered Cloud Architecture Development – Design Challenges -Inter Cloud Resource Management–Resource Provisioning and Platform Deployment –Global Exchange of Cloud Resources.

UNIT IV PROGRAMMING MODEL 9

Parallel and Distributed Programming Paradigms –Map Reduce, Twister and Iterative MapReduce –Hadoop Library from Apache –Mapping Applications Programming Support -Google App Engine, Amazon AWS -Cloud Software Environments -Eucalyptus, Open Nebula, OpenStack.

UNIT V SECURITY IN THE CLOUD 9

Security Overview –Cloud Security Challenges –Software-as-a-Service Security – Security Governance –Risk Management –Security Monitoring –Security Architecture Design –Data Security –Application Security –Virtual Machine Security.

Total No of hours 45

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1: Analyze various cloud programming models and apply them to solve problems on the cloud.

CO2: Build cloud architecture.

CO3: Explain the core concepts of the cloud computing paradigm.

CO4: Get clear knowledge of various cloud models and their services, characteristics, advantages and Challenges.

CO5: Interpret the security issues in cloud.

TEXT BOOK:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributedand Cloud Computing, From Parallel
Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2012.

REFERENCE BOOKS:

1. John W.Rittinghouse and James F.Ransome, “Cloud Computing: Implementation, Management, and Security”, CRC Press,2010.

2. Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach”,TMH, 2009.

3. George Reese, “Cloud Application Architectures: Building Applications and Infrastructure in the Cloud”O'Reilly, 2009.

4. James E. Smith, Ravi Nair, “Virtual Machines: Versatile Platforms for Systems and Processes”, Elsevier/Morgan Kaufmann, 2005.

WEBSITES

1. **www.w3schools.com**
2. **www.tutorialspoint.com**
3. **www.geeksforgeeks.org**

WEB SOURCES

1. **https://www.smartzworld.com/notes/cloud-computing-pdf-notes-cc/**
2. **https://lecturenotes.in/subject/366/cloud-computing-cc/note**

DSE - V

21DMIT32 COMPUTATIONAL INTELLIGENCE 3 0 0 3

COURSE OBJECTIVE:

- The course makes students familiar with basic principles of various computational methods of data processing that can commonly be called computational intelligence.
- To help the students to design and build CI algorithms and approaches to real-life problems, analyses and improve these algorithms and approaches, discuss decisions made during the development processes

UNIT I INTRODUCTION **9**

Artificial Intelligence – a brief review – Pitfalls of traditional AI – Why Computational Intelligence? – Computational intelligence concept - Importance of tolerance of imprecision and uncertainty - Constituent techniques – Overview of Artificial Neural Networks, Fuzzy Logic, Evolutionary Computation

UNIT II KNOWLEDGE REPRESENTATION AND REASONING 9

Proposition Logic – First Order Predicate Logic – Unification – Forward Chaining -Backward Chaining – Resolution – Knowledge Representation – Ontological Engineering – Categories and Objects – Events – Mental Events and Mental Objects – Reasoning Systems for Categories – Reasoning with Default Information – Prolog Programming.

UNIT III UNCERTAINTY 9

Non monotonic reasoning - Fuzzy Logic - Fuzzy rules - fuzzy inference - Temporal Logic- Temporal Reasoning - Neural Networks - Neuro-fuzzy Inference.

UNIT IV LEARNING 9

Probability basics – Bayes Rule and its Applications – Bayesian Networks – Exact and Approximate Inference in Bayesian Networks – Hidden Markov Models – Forms of Learning – Supervised Learning – Learning Decision Trees – Regression and Classification with Linear Models – Artificial Neural Networks – Nonparametric Models – Support Vector Machines – Statistical Learning – Learning with Complete Data – Learning with Hidden Variables- The EM Algorithm – Reinforcement Learning

UNIT V INTELLIGENCE AND APPLICATIONS 9

Natural language processing-Morphological Analysis-Syntax analysis-Semantic Analysis-AIl applications – Language Models – Information Retrieval – Information Extraction – Machine Translation – Machine Learning – Symbol-Based – Machine Learning: Connectionist – Machine Learning.

Total No of Hours: 45

COURSE OUTCOMES:

At the End of this course, the Student will be able to:

CO-1: Evaluate Fuzzy Logic applications

CO-2: Analyze Problem-solving through various searching techniques.

CO-3: Apply Computational Intelligence techniques for information retrieval

CO-4: Apply the Intelligent techniques for problem solving

CO-5: Understand fundamental concepts in Computational intelligence.

TEXT BOOKS:

1. Kumar S., “Neural Networks - A Classroom Approach”, Tata McGraw Hill, 2004.
2. Konar A., “Computational Intelligence: Principles, Techniques and Applications”, Springer Verlag, 2005.
3. Stuart Russell, Peter Norvig, Artificial Intelligence: A Modern Approach, Third Edition, Pearson Education / Prentice Hall of India, 2010.

REFERENCE BOOKS:

1. Elaine Rich and Kevin Knight, Artificial Intelligence, Third Edition, Tata McGraw-Hill, 2010.

2. Patrick H. Winston. “Artificial Intelligence”, Third edition, Pearson Edition, 2006.

3. Dan W.Patterson, Introduction to Artificial Intelligence and Expert Systems, PHI, 2006.

4. Nils J. Nilsson, Artificial Intelligence: A new Synthesis, Harcourt Asia Pvt. Ltd., 2000.

WEB SOURCES:

1. http://www.softcomputing.net/tutorial.html

GENERIC ELECTIVE

21GMIT41	**ERP SYSTEMS**	**4**	**0**	**0**	**4**

COURSE OBJECTIVE

- To know the basics of ERP

- To understand the key implementation issues of ERP
- To know the business modules of ERP
- To be aware of some popular products in the area of ERP
- To appreciate the current and future trends in ERP

UNIT I ERP Introduction 12

ERP Introduction, Benefits, Origin, Evolution and Structure: Conceptual Model of ERP, The Evolution of ERP, The Structure of ERP.

UNIT II Business Process Reengineering 12

Business Process Reengineering, Data ware Housing, Data Mining, Online Analytic Processing(OLAP), Product Life Cycle Management(PLM),LAP, Supply chain Management.

UNIT III ERP Marketplace and Marketplace Dynamics 12

ERP Marketplace and Marketplace Dynamics: Market Overview, Marketplace Dynamics, The Changing ERP Market. ERP- Functional Modules: Introduction, Functional Modules of ERP Software, Integration of ERP, Supply chain and Customer Relationship Applications.

Total hours 30

COURSE OUTCOME:

At the end of this course the students will be able to,

CO1: Describe basic concepts of ERP systems for manufacturing or service companies.

CO2: Analyze the strategic options for ERP identification and adoption.

CO3: Develop skills necessary for building and managing relationships with customers, and stakeholders.

CO4: Design the ERP implementation strategies.

CO5: Create reengineered business processes for successful ERP implementation.

TEXT BOOK:

1. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill, 2008

REFERENCE BOOKS:

1. Alexis Leon, Enterprise Resource Planning, second edition, Tata McGraw-Hill, 2008.
2. Mahadeo Jaiswal and Ganesh Vanapalli, ERP Macmillan India, 2006.

3. Vinod Kumar Grag and N.K. Venkitakrishnan, ERP- Concepts and Practice, Prentice Hall of India, 2006.

4. Summer, ERP, Pearson Education, 2008.

WEBSITES

1. www.w3schools.com

2. www.tutorialspoint.com

21GMIT41 ADVANCED EXCEL 4 0 0 4

COURSE OBJECTIVE:

- To make the student understand the special concepts in MS EXCEL.
- To practice the students how to work in list, data forms and records.
- To understand the concepts of filtering data**.**

UNIT 1 ADVANCED EXCEL FORMULAS 12

Uses of Advance Excel Formulas -VLOOKUP, HLOOKUP, SUMIF, SUMIFS, SUMPRODUCT, DSUM, COUNTIF, COUNTIFS, IF, IFERROR, ISERROR, ISNA,ISNUMBER, ISNONTEXT, OR, AND, SEARCH, INDEX, MATCH etc

UNIT 2 IF CONDITIONS 12

Various Methods and Uses of IF Conditions , When should use the &quot;IF&quot; Conditions? , Creation of Multiple IF Conditions in One Cell , Use the IF Conditions with the Other Advance Functions , How to use nested IF statements in Excel with AND, OR Functions. Sorting, Data Forms, Adding Data Using the Data Form, Finding Records Using Criteria

UNIT 3 FILTERING AND SORTING 12

Filtering Data, AutoFilter, Totals and Subtotals Total, Row, Various Methods of Filter and Advance Filter options , Creating and Updating Subtotals , Various Method of Sorting Data ,Creating, Formatting and Modifying Chart.

UNIT 4 DATA VALIDATION AND GOAL SEEK 12

Uses of Goal Seek and Scenarios Manager , Data Validation, Creating drop down lists ,using different data sources , Linking Workbooks and Uses of Edit Link options ,Excel Options, Customizing the Quick Access Tool Bar , Managing Windows, Multiple Windows , Splitting Windows.

UNIT 5 PIVOT TABLES 12

Various Methods and Options of Pivot Table, Using the Pivot Table Wizard, Changing the Pivot Table Layout, Subtotal and Grand total Options, Formatting, and Grouping items Inserting calculated fields, Pivot Table Options, Display and hide data in fields Select, Move & Clear Pivot data, Creating and Modifying a PivotChart

TOTAL HOURS: 60

TEXT BOOK

1. Jordan Goldmeler, “Advanced Excel Essentials” , APress, 2015 edition.

REFERENCE BOOK

1. John Walkenbach, “Microsoft Excel 2013 Bible”,Wiley Publications,2013

WEB SOURCES:

1. https://www.javatpoint.com/excel-tutorial

2. https://www.tutorialspoint.com/advanced_excel/index.htm

3. https://www.guru99.com/excel-tutorials.html

21GMIT41 INTERNET BASICS 4 0 0 4

COURSE OBJECTIVE

- To make the student understands the overall view of internet.
- To inculcate the students about the various facilities available in internet.
- To gain practical knowledge about internet.

UNIT I INTRODUCTION 12

Internet and its history, defining and describing the Internet, Brief history, discussing the future of the Internet, Internet Resources. Describe the important features of the Web and Web browser software, Evaluate e-mail software and Web-based e-mail services

UNIT II EMAIL 12

Email , Parts of email ,Email software , Web based email , Email address , List servers , Newsgroups ,Newsgroups names , Newsgroups readers ,Chat rooms , Conferencing

UNIT III INTERNET RESOURCES 12

Internet Resources, Games, File transfer protocol, Telnet, World Wide Web, Behavior on the Internet , Accessing the Internet , Types of access , Online services , Internet services providers , How and where to look for the service Browsing the Web , Browsing the Web.

UNIT IV FTP 12

Use FTP and other services to transfer and store data, Demonstrate the use of real-time chat and briefly describe the history of the wireless Internet. Use mailing lists, newsgroups, and newsfeeds, Create HTML documents and enhance them with browser extensions

UNIT V APPLICATIONS 12

Applications of Internet- education, business, government, Communication , Job searches, Health and medicine, Travel, Entertainment, Shopping, Stock market updates, Research.

Total No of Hours:60

COURSE OUTCOME

At the end of the course students can able to,

CO1: Develop & design mail to his/her friends

CO2: Analyze the search engine (ie) browsers.

CO3: Use the applications of internet

CO4: Understand the basic concepts and features of Web.

CO5: Understand the security threats and electronic commerce.

TEXT BOOK

1. Rohit Khurana , “COMPUTER FUNDAMENTALS and INTERNET BASICS”, Aph Publishing Corporation,2010.

REFERENCE BOOK

Margaret Levine Young, “Internet Millenium Edition “,Osborne Publications,2000.
1.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com

WEBSOURCES

1.https://www.oswaalbooks.com/download/freeresources/class10/175Quick%20Revision%20Notes%20_10th%20Computer%20Application.pdf
2. https://fcit.usf.edu/internet/chap1/chap1.htm
3. https://www.slideshare.net/osuchin/internet-basics-13440260
4. https://www.slideshare.net/argusacademy/internet-40994977

21GMIT41 MATLAB PROGRAMMING 4 0 0 4

COURSE OBJECTIVE:

To make the students to be familiar in Matlab tool containing so many toolbox such as data mining , image processing , signal processing and so on.

UNIT –I **Introduction to MATLAB**	Brief Introduction
	Installation of MATLAB
	History
	Use of MATLAB
	Key features
MATLAB software	Introduction to MATLAB Software
	MATLAB window
	Command window
	Workspace
	Command history
	Setting directory
	Working with the MATLAB user interface
	Basic commands

	Assigning variables
	Operations with variables
Data files and Data types	Character and string
	Arrays and vectors
	Column vectors
	Row vectors
UNIT – II Basic Mathematics	BODMAS Rules
	Arithmetic operations
	Operators and special characters
	Mathematical and logical operators
	Solving arithmetic equations
Operations on matrix	Crating rows and columns Matrix
	Matrix operations
	Finding transpose, determinant and inverse
	Solving matrix
UNIT – III M-Files	Writing Script file
	Executing script files
	The MATLAB Editor
	Saving m files
Plots	Plotting vector and matrix data
	Plot labelling, curve labelling and editing
GUI Design	Introduction Of Graphical User Interface
	GUI Function Property
	GUI Component Design
	GUI Container

	Writing the code of GUI Callback
	Dialog Box
	Menu Designing
	Applications
UNIT IV MATLAB Programming	Automating commands with scripts
	Writing programs with logic and flow control
	Writing functions
	Control statement Programming
	Conditional Statement Programming
	Examples
Loops and Conditional Statements	Control Flow Conditional Control — if, else, switch
	Loop Control — for, while, continue, break
	Program Termination — return
UNIT – V Image Processing with MATLAB	Importing and Visualizing Images
	Importing and displaying images
	Converting between image types
	Exporting images

	Interactive Exploration of Images
	Obtaining pixel intensity values
	Extracting a region of interest
	Computing pixel statistics
	Measuring object sizes
	Creating a custom interactive tool
	Preprocessing Images
	Adjusting image contrast
	Reducing noise in an image
	Using sliding neighborhood operations
	Using block processing operations

Total No of Hours:60

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COURSE OUTCOME:

On Completion of this course, Students can able to

CO1: Develop simple .M files in Matlab

CO2: Analyze various toolboxes available in Matlab.

CO3: Apply mathematical Functions, arrays .matrices in specified applications..

CO4: Interpret plots and export this for use in reports and presentations.

CO5: Execute and manipulate images using image processing toolbox. .

TEXT BOOKS

1.Introduction to Programming in MATLAB – Sam H.Davis

2. Introduction to MATLAB – Ela Pekalska

WEBSITES

1.www.tutorialspoint.com

WEBSOURCES

1.https://www.tutorialspoint.com/matlab/index.htm

2. https://www.slideshare.net/ashishmeet/introduction-to-matlab-18425069

SKILL ENHANCEMENT COURSES

SOFTSKILLS – I **2 0 0 2**

Course Objective:

- To enable participants Business Communication Skills
- To enhance participants E-mail writing skills
- To impart Leadership and Team Bonding skills

Credit Hours

1. **READING COMPREHENSION AND VOCABULARY** **06**

Filling the blanks – Cloze Exercise – Vocabulary building – Reading and answering Questions.

2. **LISTENING AND ANSWERING QUESTIONS.** **06**

Listening and writing – Listening and sequencing sentences – Filling in the blanks – Listening and answering questions.

3. **GROUP DISCUSSIONS** **06**

Why GD part of a selection process – Structure of a GD – strategies in GD – Team Work – Body Language

4. **CONVERSATION.** **06**

Face to face Conversation and Telephone conversation.

5. **SELF- INTRODUCTION AND ROLE PLAY** **06**

Total 30 Hours

Course Outcome

At the end of this course the students will be able to,

CO 1 Prioritize power of understanding and aids assimilation of vocables. Vocabulary to charge communication with educated words

CO 2 Develop comprehensive knowledge through listening leading to answering questions

CO 3 Build observation power and infuse self-confidence through group discussions

CO 4 Identify methodology for befitting constructional ability

CO 5 Experiments with inward looking and visualization of the ‘otherness’ of situations

Books Recommended

- Barun K. Mitra. Personality Development and Soft Skills. Oxford University Press. New

Delhi.2011.

- S.P. Sharma. Personality Development. PustaqMahal. New Delhi. 2010.Meenakshi Raman and Sangeetha Sharma. Technical Communication. Oxford University Press. New Delhi. 2009.
- Tiko, Champa& Jaya Sasikumar. Writing with a Purpose.OUP. New Delhi. 1979

<u>Web Source:</u>

- https://www.skillsyouneed.com/ips/communication-skills.html
- https://blog.smarp.com/top-5-communication-skills-and-how-to-improve-them
- https://blog.hubspot.com/service/phone-etiquette

SOFT SKILLS – II 2 0 0 2

Course Objective:

- To enable students to develop their communication skills effectively
- To enhance students Reading, Writing, Listening and Speaking skills
- To develop their self-confidence through communication

Credit Hours

1. **PRESENTATION SKILLS** **06**

Elements of an effective presentation – structure of presentation – voice modulation – Audience analysis – Body language

2. **SOFT SKILLS** **06**

Time Management – Articulateness – Assertiveness – Stress management

3. **RESUME / REPORT PREPARATION / LETTER WRITING** **06**

Structuring the resume / Report – Business letters – E-Mail Communication

4. **INTERVIEW SKILLS** **06**

Kinds of Interviews – Required by Skills – Corporate Culture – Mock Interviews

5. **30 FREQUENTLY ASKED QUESTIONS** **06**

Total 30 Hours

Course Outcome

At the end of this course the students will be able to,

CO1 Illustrate the essential of presentation skills, thoughts, structure, voice modulation, audience analysis and body language

CO2 Utilize the psychological skills pertaining to time management, articulation, assertion and stress management

CO3 Construct methodology for preparation of resume, reports, business letters and email communication

CO4 Appraise learners with varied skills needed for expose to interviews

CO5 Categorize the nature of questions asked usually in interviews

Books Recommended

- BarunK.Mitra. Personality Development and soft skills. Oxford University Press. New Delhi. 2011.
- S P Sharma. Personality Development. PustaqMahal. New Delhi. 2010.
- Meenakshi Raman and Sangeetha Sharma. Technical Communication. Oxford University

Press. New Delhi. 2009.

Web Sources:

- https://www.skillsyouneed.com/ips/communication-skills.html
- https://www.businessnewsdaily.com/5836-top-interviewing-skills.html
- https://gdpi.hitbullseye.com/Group-Discussion.php

SOFT SKILLS III	**2**	**0**	**0**	**2**

Course Objective:

- To enable students to develop their soft skills and Body Language
- To enhance students Reading, Writing, Listening and Speaking skills
- To develop their self-confidence to excel at Interviews

Credit Hours

UNIT–I **06**

Powerful Presentation

UNIT–II **06**

Reinforcement

UNIT–III **06**

Using visual aids

UNIT–IV **06**

Types and Methods of Presentations

UNIT–V **06**

Obstacles to Presentation

Total 30 Hours

<u>Course Outcome:</u>

CO1 To develop participants social and professional skills

CO2 To help participants manage time effectively

CO3 To build a strong resume to suit corporate requirements

CO4 To face interviews confidently

CO5 To enhance their aptitude abilities

<u>Books Recommended:</u>

- Roz Townsend: Presentation Skills for the Upwardly Mobile, Emerald, Chennai.
- Prasad, H. M. How to Prepare for Group Discussion and Interview. NewDelhi: Tata McGraw-Hill Publishing Company Limited, 2001.
- Pease, Allan. Body Language. Delhi: Sudha Publications, 1998.

<u>Web Sources:</u>

- https://www.skillsyouneed.com/ips/communication-skills.html
- https://venngage.com/blog/presentation-skills/
- https://gdpi.hitbullseye.com/Group-Discussion.php