



# **Department of Computer Application**

**Dr. Shyama Prasad Mukherjee University**

**(Following Upgradation of Ranchi College, under RUSA Programme, Component-1)**

**Website: [www.dspmuranchi.ac.in](http://www.dspmuranchi.ac.in)**



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## **B.Sc(COMPUTER APPLICATION)**

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### **4 Years Syllabus**



**Department of Computer Application**  
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Curriculum Structure for all Under Graduate Course as per NEP 2020 for Dr. Shyama Prasad Mukherjee University, Ranchi

Sem ester	Major Paper (Earlier)	Minor Paper (Traditional)	Minor Courses (Vocational)	Multi-Disciplinary Courses	Ability Enhancement Course (AEC)	Skill Enhancement Course (SEC)	Value Added Course (VAC)	Total Credits
I	MJ-101T(03 Credit) MJ-101P(01 Credit)	MN-101T(04 Credit)/ MN-101T(03 Credit)M N-101P(01 Credit)	-X-X-X-	MDC-101T(03 Credit)/ MDC-101T(02 Credit) MDC-101P(01 Credit)	AEC-101T(02 Credit) Hindi	SEC-101T(03 Credit)/SE C-101T(02 Credit) SEC-101P(01 Credit)	VAC-101T(02 Credit) EVS VAC-102T(02 Credit) Understanding India	20 Credits
II	MJ-201T(03 Credit) MJ-201P(01 Credit) MJ-202T(03 Credit) MJ-202P(01 Credit)	-X-X-X-	MVC-201T(03 Credit) MVC-201P(01 Credit)	MDC-201T(03 Credit)/ MDC-201T(02 Credit)M DC-201P(01 Credit)	AEC-201T(02 Credit) English	SEC-201T(03 Credit)/SE C-201T(02 Credit) SEC-201P(01 Credit)	-X-X-X-	20 Credits

**CERTIFICATE TO BE AWARDED AFTER EARNING 44 CREDITS IF A CANDIDATE WISHES TO LEAVE THE COURSE**

III	MJ-301T(03 Credit)MJ-301P(01 Credit) MJ-302T(03 Credit)(01 Credit)	MN-301T(04 Credit)/M N-301T(03 Credit) MN-301P(01 Credit)	-X-X-X-	MDC-301T(03 Credit)/M DC-301T(02 Credit) MDC-301P(01 Credit)	AEC-301T(02 Credit) Modern Indian Language-I (Sanskrit/Urdus/ Santhali/Bengali/ Panch Pargania/ Kharia/Hindi /Nagpuri/Kurux/Ho/ Khortha/Kur mali/ Mundari/Odia)	SEC-301T(03 Credit)/SE C-301T(02 Credit) SEC-301P(01 Credit)	-X-X-X-	20 Credits
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<b>IV</b>	MJ-401T(03 Credit) MJ-401P(01 Credit) MJ-402T(03 Credit) MJ-402P(01 Credit) MJ-403T(03 Credit) MJ-403P(01 Credit)	-X-X-X-	MVC-401T(03 Credit) MVC-401P(01 Credit)	X-X-	-X-	AEC-401T(02 Credit) Modern Indian Language-II (Sanskrit/Urdu/ Santhali/Bengali/ Panch Pargania/ Kharia/Hindi /Nagpuri/Kurux/Ho/ Khortha/Kurmali/ Mundari/Odia)	INT401P(04 Credit)	VAC-401T(02 Credit) Digital Education/ Health & Wellness and Yoga/Indian Knowledge System	20 Credit (If a candidate wishes to continue the course)
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## DIPLOMA TO BE AWARDED AFTER EARNING 84 CREDITS IF A CANDIDATE WISHES TO LEAVE THE COURSE

Semester	Major Paper (Earlier)	Minor Paper (Traditional)	Minor Courses (Vocational)	Multi-Disciplinary Courses	Ability Enhancement Course (AEC)	Skill Enhancement Course (SEC)	Value Added Course (VAC)	Total Credits
<b>V</b>	MJ-501T(03 Credit) MJ-501P(01 Credit) MJ-502T(03 Credit) MJ-502P(01 Credit) MJ-503T(03 Credit) MJ-503P(01 Credit)	MN-501T(04 Credit)/MN-501T(03 Credit) MN-501P(03 Credit) MN-501P(01 Credit)	-X- X-X-	X-	X-X-X	INT-501P(04 Credit) Internship Compulsory for all Students	- X-X-X-	20 Credit



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<b>VI</b>	<b>MJ- 601T(03 Credit) MJ- 601P(01 Credit) MJ- 602T(03 Credit) MJ- 602P(03 Credit) MJ- 603P(01 Credit) MJ- 604T(03 Credit) MJ- 604P(01 Credit)</b>	<b>X-X-X</b>	<b>MVC- 601T(03 Credit) MVC- 601P(01 Credit)</b>	<b>X-X-X-</b>	<b>X-X-X-</b>	<b>-X-X-X-</b>	<b>X-X-X-</b>	<b>20 Credit</b>
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**DEGREE TO BE AWARDED AFTER EARNING 120 CREDITS**

**MINIMUM CGPA OF 7.5 AND NO BACKLOG IS REQUIRED FOR A STUDENT TO BE PROMOTED TO 4<sup>th</sup> YEAR FOR OBTAINING HONOURS WITH RESEARCH DEGREE**

**NO RESTRICTION OF CGPA AND NO BACKLOG IS REQUIRED TO BE PROMOTED TO 4<sup>th</sup> YEAR FOR OBTAINING HONOURS DEGREE**



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<b>VII</b>	<b>MJ-701T(03 Credit)</b> <b>MJ-701P(01 Credit)</b> <b>MJ-702T(03 Credit)</b> <b>MJ-702P(01 Credit)</b> <b>MJ-703T(03 Credit)</b> <b>MJ-703P(01 Credit)</b> <b>MJ-704T(03 Credit)</b> <b>MJ-704P(01 Credit)</b>	<b>MN-701T(04 Credit)/</b> <b>MN-701T(03 Credit)</b> <b>MN-701P(01 Credit)</b>	<b>X-X-X</b>	<b>X-X-X</b>	<b>X-X-X</b>	<b>X-X-X</b>	<b>X-X-X</b>	<b>20 Credit</b>
<b>VIII</b>	<b>MJ-801T(03 Credit)</b> <b>MJ-801P(01 Credit)</b> <b>AMJ-801T(03 Credit)</b> <b>AMJ-801P(01 Credit)</b> <b>AMJ-802T(03 Credit)</b> <b>AMJ-802P(01 Credit)</b> <b>AMJ-803T(03 Credit)</b> <b>AMJ-803P(01 Credit)</b>	<b>X-X-X</b>	<b>MVC-801T(03 Credit)</b> <b>MVC-801P(01 Credit)</b>	<b>X-X-X</b>	<b>X-X-X</b>	<b>X-X-X</b>	<b>X-X-X</b>	<b>20 Credit</b>

**DEGREE WITH HONOURS AND RESEARCH TO BE AWARDED IF A STUDENT EARNS 160 CREDITS FOR ALL CASES WHERE PROJECT/DISSERTATION IS OPTED.**

**DEGREE WITH HONOURS TO BE AWARDED IF A STUDENT EARNS 160 CREDITS FOR ALL CASES WHERE ADDITIONAL 03 ADVANCED MAJOR COURSES ARE OPTED.**



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## Implemented from Academic Session 2023-2027

<b>DR SHYAMA PRASAD MUKHERJEE UNIVERSITY, RANCHI</b> <b>DEPARTMENT OF COMPUTER APPLICATION</b> <b>COURSE OF STRUCTURE FOR FOUR YEAR UNDERGRADUATE PROGRAMME 2023 ONWARDS</b> <b>SEMESTER WISE COURSE CODE AND MARKS FOR SINGLE MAJOR</b>			
SEMESTER	MAJOR		MARKS
	CODE	PAPERS	
I	MJ-101T	Programming using C/C++	75
	MJ-101P	Lab Based on C/C++	25
II	MJ-201T	Data Structures with C	75
	MJ-201P	Lab Based on Data Structure	25
	MJ-202T	Operating System	75
	MJ-202P	Lab Based on Linux	25
III	MJ-301T	Programming in Java	75
	MJ-301P	Lab Based on Java	25
	MJ-302T	Theory of Computation	75
	MJ-302P	Lab Based on HTML	25
IV	MJ-401T	Database Management System	75
	MJ-401P	Lab Based on Oracle	25
	MJ-402T	Internet Technologies	75
	MJ-402P	Lab Based on Internet Technologies	25
	MJ-403T	Computer Networks	75
	MJ-403P	Lab Based on Computer Networks	25
V	MJ-501T	Programming using Python	75
	MJ-501P	Lab Based on Python	25
	MJ-502T	Object Oriented Modeling & Design	75
	MJ-502P	Lab Based on Object Oriented with UML	25
	MJ-503T	Computer Graphics	75
	MJ-503P	Lab Based on Computer Graphics	25
	INT-501P	Internship	100
VI	MJ-601T	PHP Programming	75
	MJ-601P	Lab on PHP Programming	25
	MJ-602T	Software Engineering	75
	MJ-602P	Lab Based on Software Engineering	25
	MJ-603T	Data Warehousing and Data Mining	75



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	MJ-603P	Lab Based on Data Mining		25
	MJ-604T	Project Work		75
	MJ-604P	Lab Based on Project		25
VII	MJ-701T	Advance Java Programming		75
	MJ-701P	Lab Based on JSP, Servlet		25
	MJ-702T	Cyber Security		75
	MJ-702P	Lab Based on Cyber Security		25
	MJ-703T	Artificial Intelligence		75
	MJ-703P	Lab Based on Artificial Intelligence		25
	MJ-704T	E-Commerce and Application		75
	MJ-704P	Lab Based on E-Commerce		25
VIII	MJ-801T	Digital image Processing		75
	MJ-801P	Lab Based on Digital Image Processing		25
	RC-1	Research Methodology	Research Course	100
	RC-2	Research Proposal	Research Course	100
	RC-3	Research Report	Research Course	100
	OR			
	AMJ-801T	Cloud Computing		75
	AMJ-801P	Lab Based on Cloud		25
	AMJ-802T	Design and Analysis of Algorithms		75
	AMJ-802P	Lab Based on Algorithms		25
	AMJ-803T	Data Science		75
	AMJ-803P	Lab Based on Machine Learning		25

	<b>Skill Enhancement Course (SEC)</b>			
	<b>CODE</b>	<b>PAPERS</b>		
I	SEC-101T	Computer Fundamental and Office Automation		50
	SEC-101P	Lab Based on Ms office		25
II	SEC-201T	Soft Skills		50
	SEC-202P	Lab Based on Soft Skills		25
III	SEC-301T	Organizational Behaviour		50
	SEC-302P	Lab Based on Organizational Behaviour		25



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## Curriculum and Credit Framework for Undergraduate Programmes

### Introduction

The National Education Policy (NEP) 2020 (hereafter referred to as NEP or Policy) recognizes that higher education plays an extremely important role in promoting human as well as societal well-being and in developing India as envisioned in its Constitution - a democratic, just, socially conscious, cultured, and humane nation upholding liberty, equality, fraternity, and justice for all. It notes that “given the 21st-century requirements, quality higher education must aim to develop good, thoughtful, well-rounded, and creative individuals”.

The NEP 2020 states, *“Assessments of educational approaches in undergraduate education that integrate the humanities and arts with Science, Technology, Engineering and Mathematics (STEM) have consistently shown positive learning outcomes, including increased creativity and innovation, critical thinking and higher-order thinking capacities, problem-solving abilities, teamwork, communication skills, more in-depth learning and mastery of curricula across fields, increases in social and moral awareness, etc., besides general engagement and enjoyment of learning”*

Further, it also recommends that *“the undergraduate degree will be of either 3 or 4-year duration, with multiple exit options within this period, with appropriate certifications, e.g., a UG certificate after completing 1 year in a discipline or field including vocational and professional areas, or a UG diploma after 2 years of study, or a Bachelor’s degree after a 3-year programme. The 4-year multidisciplinary Bachelor’s programme, however, shall be the preferred option since it allows the opportunity to experience the full range of holistic and multidisciplinary education in addition to a focus on the chosen major and minors as per the choices of the student”*.

In accordance with the NEP 2020, the UGC has formulated a new student-centric “Curriculum and Credit Framework for Undergraduate Programmes (CCFUP)” incorporating a flexible choice-based credit system, multidisciplinary approach, and multiple entry and exit options. This will facilitate students to pursue their career path by choosing the subject/field of their interest. The NEP highlights certain fundamental principles that would guide both the education system at large, as well as individual educational institutions. The principles that have a direct bearing on the curricula for different levels of higher education include:

- i. Recognizing, identifying, and fostering the unique capabilities of each student to promote her/his holistic development;
- ii. Flexibility, so that learners can select their learning trajectories and programmes, and thereby choose their own paths in life according to their talents and interests;
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- iv. Multidisciplinary and holistic education across the sciences, social sciences, arts, humanities, and sports for a multidisciplinary world;
- v. Emphasis on conceptual understanding rather than rote learning, critical thinking to encourage logical decision-making and innovation; ethics and human & constitutional values, and life skills such as communication, teamwork, leadership, and resilience;
- vi. Extensive use of technology in teaching and learning, removing language barriers, increasing access for *Divyang* students, and educational planning and management;
- vii. Respect for diversity and respect for the local context in all curricula, pedagogy, and policy;
- viii. Equity and inclusion as the cornerstone of all educational decisions to ensure that all students are able to thrive in the education system and the institutional environment are responsive to differences to ensure that high-quality education is available for all.
- ix. Rootedness and pride in India, and its rich, diverse, ancient, and modern culture, languages, knowledge systems, and traditions.

**The NEP envisages several transformative initiatives in higher education. These include:**

- Introducing holistic and multidisciplinary undergraduate education that would help develop all capacities of human beings - intellectual, aesthetic, social, physical, emotional, ethical, and moral - in an integrated manner; soft skills, such as complex problem solving, critical thinking, creative thinking, communication skills; and rigorous specialization in a chosen field (s) of learning.
- Adoption of flexible curricular structures in order to enable creative combinations of disciplinary areas for study in multidisciplinary contexts that would also allow flexibility in course options that would be on offer to students, in addition to rigorous specialization in a subject or subjects.
- Undergraduate degree programmes of either 3 or 4-year duration, with multiple entry and exit points and re-entry options, with appropriate certifications such as:
  - a UG certificate after completing 1 year (2 semesters) of study in the chosen fields of study,
  - a UG diploma after 2 years (4 semesters) of study,
  - a bachelor's degree after a 3-year (6 semesters) programme of study,
  - a 4-year bachelor's degree (honours) after eight semesters programme of study. If the student completes a rigorous research project in their major area(s) of study in the 4th year of a bachelor's degree (honours with research).



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- The 4-year bachelor's degree programme is considered a preferred option since it would provide the opportunity to experience the full range of holistic and multidisciplinary education in addition to a focus on the chosen major and minors as per the choices of the student.
- Inclusion of credit-based courses and projects in the areas of community engagement and service, environmental education, and value-based education.

- Environment education to include areas such as climate change, pollution, waste management, sanitation, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living.

- Value-based education to include the development of humanistic, ethical, Constitutional, and universal human values of truth, righteous conduct, peace, love, nonviolence, scientific temper, citizenship values, and life skills.

- Lessons in service and participation in community service programmes to be an integral part of holistic education.

- Global Citizenship Education and education for sustainable development to form an integral part of the curriculum to empower learners to become aware of and understand global and sustainable development issues and to become active promoters of more peaceful, tolerant, inclusive, secure, and sustainable societies.

- Students to be provided with opportunities for internships with local industry, businesses, artists, crafts persons, etc., as well as research internships with faculty and researchers at their own or other HEIs/research institutions, so that students may actively engage with the practical side of their learning and, as a by-product, further improve their employability.

- Reorienting teaching programmes to ensure the development of capabilities across a range of disciplines including sciences, social sciences, arts, humanities, languages, as well as vocational subjects. This would involve offering programmes/courses of study relating to Languages, Literature, Music, Philosophy, Art, Dance, Theatre, Statistics, Pure and Applied Sciences, Sports, etc., and other such subjects needed for a multidisciplinary and stimulating learning environment.

Preparing professionals in cutting-edge areas that are fast gaining prominence, such as Artificial Intelligence (AI), 3-D machining, big data analysis, and machine learning, in addition to genomic studies, biotechnology, nanotechnology, neuroscience, with important applications to health, environment, and sustainable living that will be woven into undergraduate education for enhancing the employability of the youth.



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## Curriculum Framework

### Main features of the New Curriculum Framework

The new curriculum framework will have the following features:

- I. Flexibility to move from one discipline of study to another;
- II. Opportunity for learners to choose the courses of their interest in all disciplines;
- III. Facilitating multiple entry and exit options with UG certificate/ UG diploma/ or degree depending upon the number of credits secured;
- IV. Flexibility for learners to move from one institution to another to enable them to have multi and/or interdisciplinary learning;
- V. Flexibility to switch to alternative modes of learning (offline, ODL, and Online learning, and hybrid modes of learning).

## Definitions, Eligibility, and Duration of the Programme

### Semester/Credits:

- A semester comprises 90 working days and an academic year is divided into two semesters.
- A summer term is for eight weeks during summer vacation. Internship/apprenticeship/work-based vocational education and training can be carried out during the summer term, especially by students who wish to exit after two semesters or four semesters of study. Regular courses may also be offered during the summer on a fast-track mode to enable students to do additional courses or complete backlogs in coursework. The HEIs can decide on the courses to be offered in the summer term depending on the availability of faculty and the number of students.

### Major and Minor disciplines:

- **Major discipline** is the discipline or subject of main focus and the degree will be awarded in that discipline. Students should secure the prescribed number of credits (about 50% of total credits) through core courses in the major discipline.
- **Minor discipline** helps a student to gain a broader understanding beyond the major discipline. For example, if a student pursuing an Economics major obtains a minimum of 12 credits from a bunch of courses in Statistics, then the student will be awarded B.A. degree in Economics with a Minor in Statistics.

### Awarding UG Certificate, UG Diploma, and Degrees:

- **UG Certificate:** Students who opt to exit after completion of the first year and have secured 40 credits will be awarded a UG certificate if, in addition, they complete one vocational course of 4 credits during the summer vacation of the first year. These students are allowed to re-enter



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- the degree programme within three years and complete the degree programme within the stipulated maximum period of seven years.
- **UG Diploma:** Students who opt to exit after completion of the second year and have secured 80 credits will be awarded the UG diploma if, in addition, they complete one vocational course of 4 credits during the summer vacation of the second year. These students are allowed to re-enter within a period of three years and complete the degree programme within the maximum period of seven years.
- **3-year UG Degree:** Students who wish to undergo a 3-year UG programme will be awarded UG Degree in the Major discipline after successful completion of three years, securing 120 credits and satisfying the minimum credit requirement as given in table 2 (Section 5).
- **4-year UG Degree (Honours):** A four-year UG Honours degree in the major discipline will be awarded to those who complete a four-year degree programme with 160 credits and have satisfied the credit requirements as given in table 2 in Section 5.
- **4-year UG Degree (Honours with Research):** Students who secure 75% marks and above in the first six semesters and wish to undertake research at the undergraduate level can choose a research stream in the fourth year. They should do a research project or dissertation under the guidance of a faculty member of the University/College. The research project/dissertation will be in the major discipline. The students who secure 160 credits, including 12 credits from a research project/dissertation, are awarded UG Degree (Honours with Research).
- **Internship:** A course requiring students to participate in a professional activity, work experience, or cooperative education activity with an entity external to the education institution, normally under the supervision of an expert of the given external entity. A key aspect of the internship is induction into actual work situations. Internships involve working with local industry, government or private organizations, business organizations and similar entities to provide opportunities for students to actively engage in on-site experiential learning.
- ❖ **Students are advised to pursue the Internship Course in the following period:**
  - I. Break between II & III Semester of one paper containing 4 Credits (Compulsory for all students) or
  - II. Break between IV & V Semester of one paper containing 4 Credits (Compulsory for all students) or
  - III. During V Semester of one paper containing 4 Credits (Compulsory for all students).



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## ❖ Multi-disciplinary Course of three (03) Credits each:

Semester 1	one paper	3 Credits
Semester 2	one paper	3 Credits
Semester 3	one paper	3 Credits

There will be an introductory paper of each subject

A students will study three different subjects in multi-disciplinary course during first three semesters (one subjects per semester) from the following list:

### List of Multidisciplinary Subjects

1st Semester	2nd Semester	3rd Semester
Botany	Physics	Zoology
Chemistry	Geology	Political Science
Mathematics	History	Sociology
Anthropology	Psychology	Kharja
Commerce	Hindi	Kurmali
Geography	Ho	Kurux
Bengali	Khortha	Sanskrit
English	Nagpuri	Economics
Santali	PanchPargania	Kharja
Mundari	Philosophy	Urdu

Students will not be allowed to choose or repeat course already undertaken at the higher secondary level (12<sup>th</sup> classes) and courses opted for Major and Minor course.

## ❖ Minor Course (Vocational) of Four Credits each:

Semester 2	one paper	MVC-1	(3T + 1P Credits)
Semester 4	one paper	MVC-2	(3T + 1P Credits)
Semester 6	one paper	MVC-3	(3T + 1P Credits)
Semester 8	one paper	MVC-4	(3T + 1P Credits)

Students shall have an option of selecting any one of the Vocational Course from the Pool



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## SEMESTER- I

**COURSE CODE** :- MJ-101T  
**COURSE TITLE** :- PROGRAMMING USING C/C++  
**CREDIT** :- 3

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

### **Module 1: Introduction to C and C++:**

About C, Evolution of C/C++, Overview of Procedural Programming Language and Object Oriented Programming Languages, Structure of a C/C++ Program, Compilers & Interpreters, Compiling a C/C++ Program, A Simple C/C++ Program.

**Module 2: Data Types, Variables, and Constants:** Data Types Variables, Constants Operators, Type Modifiers and Expressions Operators, Type Modifiers Expressions, Formatted Console I/O (printf(), scanf(), cin, cout) Unformatted Console I/O Functions. **Control Constructs in C/C++:** Control Statements, Conditional Statements, Loops in C, the break Statement, the Continue Statement.

**Module 3: Arrays :** Introduction to Arrays, One-Dimensional & Two-Dimensional Arrays, Introduction to strings **Functions:** Introduction to Functions, Function Declaration and Prototypes, Recursion in Function.

**Module 4: Pointers:** Introduction to Pointers, Pointer Notation. Pointer Declaration and Initialization, Accessing Variables through Pointers, Pointer to Pointer, Pointer Expressions, Dynamic memory Allocation, passing pointers as function arguments, Passing array to function, Pointers and One-Dimensional Arrays. **Structures:** Structure Definition, Structure Initialization, Arrays of Structures, and Arrays within Structures. Structures within Structures, Passing Structures to Functions.

**Module 5: Using Classes in C++:** Defining class and Object, member functions, Inline function, Static function, Friend function, Function overloading, Constructor, parametrized constructor, copy constructor, overloading constructor, and Destructor.

**Operator overloading, Inheritance, and polymorphism:** **Operators overloading:** Unary operator (++ , --, -) binary operators(+, -, \*, \) using member function and friend function **Inheritance:** Derived class and base class, protected access specifier, Types of Inheritance (Multilevel, Multiple, Hierarchical, Hybrid Inheritance) , derived class constructors, abstract base class, public and private inheritance, containership **Polymorphism:** "New" & "delete" pointer to objects, pointer to pointer, Pointer to derived class and "this" pointer, virtual function.

**Module 6: File Handling in C/C++:** What is a File, Defining and Opening a File, Functions for Random Access to Files.

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Book Recommended:

1. Programming in C By E. Bala Guruswamy
2. Programming in C By Yashwant Kanetkar
3. Programming in C++ by E. Bala Guruswamy

## Course Outcomes

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

1	Demonstrate an understanding of algorithms in the problem-solving process.
2	Identify the necessary properties of good problem-solving techniques.
3	Create and analyze algorithms for solving simple problems.
4	Use incremental program development to create, test, and debug algorithms for solving simple problems.

## SEMESTER- I

**COURSE CODE** : - **MJ-101P**  
**SUBJECT** : - **LAB of C/C++ Programming**  
**CREDIT** : - **1**

### List of C Programs as Assignments:

1. Write a Hello World Program in C.
2. Write a C program to check whether the given number is positive or negative.
3. Write a C Program to find greatest of three numbers.
4. Write a C Program to print Fibonacci series in a given range.
5. Write a C Program to find factorial of a given number.
6. Write a C program to find Prime numbers in a given range.
7. Write a C Program to check if given number is Armstrong or not.
8. Write a C Program to check if given number is palindrome or not.
9. Write a C program to display palindrome numbers in a given range
10. Write a C Program to check if number is odd or even
11. Write a C Program to find out the ASCII value of a character
12. Write a C Program to find the size of int, float, double and char
13. Write a C Program to check whether an alphabet is vowel or consonant.





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14. Write a C Program to check leap year.
15. Write a C Program to find sum of first n natural numbers.
16. Write a Program to convert string from upper case to lower case.
17. Write a Program to convert string from lower case to upper case.
18. Write a C program to Sort a set of strings in ascending alphabetical order.
19. Write a C program Find length of a string without using strlen()
20. Write a C program to String concatenation without using strcat.
21. Write a Program to sort array in ascending order.
22. Write a C program to find largest element of given array.
23. Write a C program to find sum of array elements.
24. Write a C Program to find number of elements in an array.
25. Find the value of  $nPr$  for given value of n & r.
26. Find the value of  $nCr$  for given value of n & r.
27. C Program to multiply two floating numbers.
28. C Program to find out Quotient and Remainder.
29. C Program to find average of two numbers
30. Binary to decimal conversion
31. C Program to convert Decimal to Binary
32. Write a c program to find multiplication of two matrices.
33. Write a c program to add two matrices.
34. Write a program in C to find the sum of the series  $1!/1+2!/2+3!/3+4!/4+5!/5$
35. WAP to display the following pattern:

```

                11
            11    10    11
        11    10    9    10    11
    11    10    9    8    9    10    11
```

## FUNCTION

Write the following programs using function:

1. Write a C program to Reverse an input number using recursion.
2. Write a C program to Reverse a String using recursion.
3. Write a C programming to find out maximum and minimum of some values using function which will return an array.
4. Write a C Program to find greatest of three numbers.
5. Write a C Program to print Fibonacci series in a given range.

## Pointer

1. Write a Program to sort array in ascending order.
2. Write a C program to find largest element of given array.





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3. Write a C program to find sum of array elements.
4. Write a C Program to find number of elements in an array.
5. Write a C program of Binary to decimal conversion

## Lab of C++ program as assignment:

1. Write a C++ program to find the sum for the given variables using function with default arguments.
2. Write a C++ program to swap the values of two variables and demonstrates a function using call by value.
3. Write a C++ program to swap the values of two variables and demonstrates a function using Call by reference using reference type (&).
4. Write a C++ program to swap the values of two variables and demonstrates a function using Call by reference using pointer (\*).
5. Write a C++ program to swap the values of two dynamically allocated variables and release the memory after swapping. (use new & delete operators)
6. Write a program to find the largest, smallest & second largest of three numbers. (use inline function MAX and MIN to find largest & smallest of 2 numbers)
7. Write a program to calculate the volume of different geometric shapes like cube, cylinder and sphere and hence implement the concept of Function Overloading.
8. Write a C++ program to create a class called COMPLEX and implement the following overloading functions ADD that return a complex number:
  - (i) ADD (a, s2) – where 'a' is an integer (real part) and s2 is a complex number
  - (ii) ADD (s1, s2) – where s1 and s2 are complex number
9. Write a C++ Program to display Names, Roll No., and grades of 3 students who have appeared in the examination. Declare the class of name, Roll No. and grade. Create an array of class objects. Read and display the contents of the array.
10. Write a C++ program to declare Struct. Initialize and display contents of member variables.
11. Write a C++ program to declare a class. Declare pointer to class. Initialize and display the contents of the class member.
12. Write a C++ program to use scope resolution operator. Display the various values of the same variables declared at different scope levels.
13. Write a C++ program to allocate memory using new operator.
14. Write a C++ program to create multilevel inheritance. (Hint: Classes A1, A2, A3)
15. Write a C++ program to create an array of pointers. Invoke functions using array objects.
16. Write a C++ program to use pointer for both base and derived classes and call the member function. Use Virtual keyword.



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## SEMESTER- II

**COURSE CODE** : - MJ-201T  
**COURSE TITLE** : - DATA STRUCTURE WITH C  
**CREDIT** : - 3  
**NO OF LECTURES:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1: Introduction to C Programming:** - Basic Concepts, Algorithms, Notations, Data Structure Operations. Implementations of Data Structures, Mathematical Notations, Function

**Module 2: Arrays:-** Insertion and deletion of the element from an Array, Static Memory Allocation. Searching: Linear or Sequential search, Binary Search **Sorting:** Bubble sort, Selection Sort, Insertion sort, Quick Sort, Merge Sort

**Module 3: Stack:** Implementation of Stack, Array-based Implementation. Applications of Stack. Evaluating Postfix Expression, Simulating Recursive Function Using stack. **Queue:** Queue Implementation, Array-based Implementation.

**Module 4: Linked Lists:** Dynamic Allocation of Memory, Representation of Linked List. Implementation of Single Linked List, Insertion, Deletion and traversing through single linked list. Implementation of Doubly Linked Lists, Insertion, deletion and traversing through Double linked list.

**Module 5: Trees(Linked list based Implementation):** Introduction to Trees, Binary Tree, Implementation of Binary tree, Binary Tree Traversal, Implementation of Binary Search tree, Insertion, Deletion and traversing through BST. Introduction of (Threaded Binary Trees, AVL Tree, B and B+ Tree)

**Module 6:** Graph: Introduction to Graph, Depth first search (DFS) and Breadth first Search (BFS) graph



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## Course Outcomes

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

1	Analyze run-time execution of previous learned sorting methods, including selection, merge sort, insertion sort and Quick sort
2	Have practical knowledge on the applications of data structures
3	Be capable to identify the appropriate data structure for given problem

**Books Recommended:** i) Data Structures – Lipschutz.

ii) Data Structures through C-Y.P. Kanetkar.

iii) Data Structure – Samanta

## SEMESTER-II

**COURSE CODE** : - **MJ-201P**  
**SUBJECT** : - **LAB of Data Structure with C**  
**CREDIT** : - **1**

## **Lab of Data Structure with C as assignment**

1. Program to Find the Number of Elements in an Array
2. Develop and implement a menu driven program in C for the following Array operations
  - a. Creating Array of N Integer elements.
  - b. Display of Array elements with suitable headings.
  - c. Inserting an element (ELEM) at a given valid position (POS).
  - d. Deleting an element at a given valid position (POS).
  - e. Exit
3. Programs for Stack, Queues using Arrays
4. Program to convert an Infix Expression into Postfix and Postfix Evaluation
5. Program to implement stack using arrays
6. Program to implement queue using arrays
7. Program to reverse elements in a queue
8. Program to create add remove & display element from single linked list
9. Program to create add remove & display element from double linked list
10. Program to count number of nodes in linear linked list



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11. Program to concatenate two linear linked lists
12. Program to accept a singly linked list of integers & sort the list in ascending order.
13. Program to reverse linked list
14. Program for the creation of binary tree in c
15. Program for pre-order, post-order & in-order traversals of a binary tree using non recursive.
16. Program to count no, of leaves of binary tree
17. Program for implementation of Binary Search -tree (insertion & deletion)
18. Program to implement bubble sort program using arrays
19. Program to implement merge sort using arrays
20. Program to implement selection sort program using arrays
21. Program to implement insertion sort program using arrays
22. Program to implement bubble sort program using pointers
23. Program to implement linear search using arrays
24. Program to implement Tower of Hanoi problem.
25. Program to implement binary search using arrays



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## SEMESTER-II

**COURSE CODE** : - MJ-202T  
**COURSE TITLE** : - OPERATING SYSTEM  
**CREDIT** : - 3  
**TOTAL LECTURES:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1: Concept of Operating System:** Simple batch systems, multi programmed batch systems, time-sharing systems, parallel systems, distributed systems, real-time systems.

**Module 2: Computer System structure:** Computer System Operation, I/O structures storage, structure, storage hierarchy and hardware protection.

**Module 3: Process concept:** process state, process control blocks, process scheduling and schedulers

**Process Synchronization:** Critical Section Problem, Bakery algorithm, Semaphores (Producer-Consumer problems, Synchronization problems (Reader-Writer's problem, Dining philosopher problem, process state, process control blocks, process scheduling and

**Module 4: CPU scheduling:** CPU-I/O burst cycle, scheduling criteria, scheduling algorithms (non-pre-emptive-FCFS, SJFS, Pre-emptive-SJFS, and RR).

**Module 5: Deadlock:** Introduction of Deadlock, Deadlock Prevention, Deadlock Avoidance

Algorithm (Banker's algorithm), Deadlock Detection and Deadlock Recovery.

**Module 6: Memory management:** Contiguous allocation, Paging, Swapping, Segmentation.

Virtual memory- Demand paging, page replacement, page replacement algorithms (FIFO, LRU)

Thrashing.**Disk structure:** Disk Scheduling (FCFS, SSTF, SCAN), Security- The problem, authentication, and program- threats, encryption.

## Course Outcomes

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



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1	Understand the general architecture of computer system.
2	Understand, contrast and compare differing structures for operating systems
3	Gain proficiency needed to analyse theory and implementation of: processes, scheduling, I/O and files systems.
4	Be familiar with various types of operating systems including Unix /Linux
5	Get in-depth knowledge of memory management for operating systems

**Books Recommended:** Operating System: Peter Gelvin  
God bole, Dhamdhare

## SEMESTER-II

**COURSE CODE** : - MJ-202P  
**SUBJECT** : - LAB of Linux  
**CREDIT** : - 1

### **Lab of Linux as assignment**

1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.
2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.
3. Usage of following commands: chmod, grep, tput (clear, highlight), bc.
4. Write a shell script to check if the number entered at the command line is prime or not.
5. Write a shell script to modify “cal” command to display calendars of the specified months.
6. Write a shell script to modify “cal” command to display calendars of the specified range of months.
7. Write a shell script to accept a login name. If not a valid login name display message – “Entered login name is invalid”



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## SEMESTER- III

**COURSE CODE** : - MJ-301T  
**COURSE TITLE** : - PROGRAMMING IN JAVA  
**CREDIT** : - 3  
**TOTAL LECTURES:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Introduction to Java: History of Java, features of Java, types of Java programs. JDK Tools: Javac compiler, Java interpreter, applet viewer, Java tools, Javap disassemble, Javadoc Tool, JavahTool, Java keywords, Data types in Java, Variable naming conventions, Initializing variables, literals, operators, type conversion, construct, looping construct, Arrays and vectors.

**Module 2:** Classes and objects: Declaring classes, creating objects, declaring objects, declaring methods, passing arguments to methods, Constructors, access specifies (public, private, protected, Default), modifiers, the Method Overloading, Method Overriding, Garbage collection (Introduction

**Module 3:** Inheritance: Introduction to Inheritance, Inheritance using Super, Types of Inheritance, Abstract class and Interface

**Module 4:** Introduction to threads: Threads, Single threaded and multithreaded applications, life cycle of a Thread, the current thread, the thread class, Problems in multithreading.

**Module 5:** Packages: Java packages, using a package, the Lang packages, the package, the creating a package. **Exception Handling** - Exception Handling Fundamentals – Exception Types, Uncaught Exceptions, Using try and catch, Multiple catch clauses, Nested try statements, throw, throws, finally, Java's built- in Exceptions

**Module 6:** Applets & Applications: Applet class, Applet & HTML, the Life cycle of an Applet, Graphic class (Introduction), Passing parameters to Applets, Creating an application, Introduction to JDBC



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## Course Outcomes

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

1	Elaborate the use of JDK of various versions for programming
2	Identify the latest know-how related to the new developments in the field of Java
3	Apply the knowledge gained for their project work as well as to develop some GUI applications.
4	Design solutions in JAVA

## **Books Recommended:**

1. Java- Complete Reference
2. Mastering Java

## **SEMESTER- III**

**COURSE CODE** : - **MJ-301P**  
**SUBJECT** : - **LAB of Java**  
**CREDIT** : - **1**

## **List of java program as assignment**

1. WJJP to show the characteristic of a number. {E.g. 24 it has two coefficients 2 in tens position and 4 in units position. It is composed of 2 and 3. It is a positive number. Also show whether it is odd or even.
2. WJJP to take input through command line argument and do the following:
  - a) Check whether the number is prime.
  - b) Generate the reverse a number.
3. Write a menu driven program using switch in Java to perform following:
  - a) For input of 1, check whether the number is prime
  - b) For input of 3, find the factors of the number
  - c) For input of 5, check the number is odd or even.
4. Write a program in Java to generate hexadecimal equivalent of a number without using array.
5. WJJP to take two number inputs through command line argument and do the following:
  - a) Check whether two numbers are prime to each other or not.
  - b) Find LCM of two numbers.





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6. WAJP to create a class and exhibit the role of static functions (other than main) by declaring, defining and calling them.
7. WAJP to compute and display the count of occurrence of 4 in a number. E.g. 4564 will compute 2.
8. WAJP to sort a list of numbers in ascending order.
9. Write a program in Java to take input of two  $3 \times 3$  matrices through command line argument and then:
  - a) Add them up and display the result
  - b) Subtract them and display the result
  - c) Multiply them and display product
10. WAJP to count the number of words, characters in a sentence.
11. Write a program in Java to take input of a sentence through command line argument and then count the number of words and vowels.
12. WAJP to handle the Exception using try and multiple catch block; the exceptions that you will handle are, number format error, array bound error and divide by zero.
13. WAJP to create a class called Room with two data member length and width and then implement constructor overloading in it.
14. WAJP to create a class called Fraction with data member numerator and denominator; take input (through command line argument) of two fractions and then add, subtract, multiply and divide, finally display the result in reduced term.
15. Write a program in Java to create a class for Employee having 2 data member code and name. Then create 3 classes Officer, AdminStaff and MStaff. The Officer class has data members designation and pay-scale; the AdminStaff has data members grade and pay-band; the MStaff has data member department and two sub-classes Regular and Casual. The Regular staff has data members level and consolidated-pay and Casual has data member daily-wage. Take all inputs through constructors and write appropriate methods for displaying one data for each type of class.
16. WAJP to design a class called Account using the inheritance and static that show all function of bank (withdrawal, deposit) and generate account number dynamically.
17. Write a program in Java to explain the role of the following:
  - a) Non-parameterized constructor
  - b) Parameterized constructor
  - c) Copy constructor
18. WAJP to design an application Password.java that produces and prints a random password depending upon name of an individual. If the input is Abdul Kalam then the password would be 33421LAM. Note: take the first name A=1, B=2, D=4, U=21 where  $2+1=3$ , and L=12, where  $1+2=3$ ; so the number comes to be 12433, so u can find out.



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## SEMESTER-III

**COURSE CODE** :- MJ-302T  
**COURSE TITLE** :- Theory of Computation  
**CREDIT** :- 3  
**TOTAL LECTURE** :- 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Introduction to Automata: Study and Central concepts of automata theory, An informal picture of finite automata, deterministic and non-deterministic finite automata, applications of finite automata, finite automata with epsilon – transitions.

**Module 2:** Regular expression and languages: Regular expressions, finite automata and regular expressions, Applications of regular expressions, algebraic laws of regular expressions.

**Module 3:** Properties of Regular Languages: Proving languages not to be regular, closure properties of regular languages, equivalence and minimization of automata.

**Module 4:** Context – free Grammars and Languages: Parse trees , Applications of context free grammars, Ambiguity in grammars and languages.

**Module 5:** Pushdown Automata: Pushdown automation (PDA), the language of PDA, equivalence of PDAs and CFG's,

**Module 6:** Introduction to Turing Machine: The Turing machine, programming techniques for Turing machine.

### Course Outcomes

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

1	Constructs the grammars for any given finite automata, pushdown automata or turing machines
2	Solve computational problems regarding their computability and complexity and prove the basic results of the theory of computations
3	Make use of pumping lemma to show that a language is not regular



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## Books Recommended:

1. J.E. Hopcroft, et.al. - Introduction to Automata Theory, Languages and Computation, 2<sup>nd</sup> Edn. Pearson Education, New Delhi 2001
2. K.L.P. Misra – et.al. - Theory of Computer Science, 2<sup>nd</sup> Edn. PHI, New Delhi, 2000

## SEMESTER- III

**COURSE CODE** :- **MJ-302P**  
**COURSE TITLE** :- **LAB BASED ON HTML**  
**CREDIT** :- **1**

### Suggested Practical List

1. Create an HTML document with following formatting – Bold, Italics, Underline, Colors, Headings, Title, Font and Font Width, Background, Paragraph, Line Brakes, Horizontal Line, Blinking text as well as marquee text.
  2. Create an HTML document with Ordered and Unordered lists, Inserting Images, Internal and External linking
  3. Create an HTML displaying this semester's time table.
  4. Create a website with horizontal and vertical frames. Top horizontal frame showing your college's name and logo. Bottom horizontal frame split into two vertical frames. The left frame with hyperlinks to pages related to faculty, courses, student activities, etc. The right frame showing corresponding pages based on the link clicked on the left frame.
1. Create a student registration form using HTML which has the following controls:
    - I. Text Box
    - II. Dropdown box
    - III. Option/radio buttons
    - IV. Check boxes
    - V. Reset and Submit button



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## SEMESTER- IV

**COURSE CODE : - MJ-401T**  
**COURSE TITLE : - DATA BASE MANAGEMENT SYSTEM**  
**CREDIT : - 3**  
**TOTAL LECTURES: - 45**

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Introduction to DBMS- Purpose, difference with respect to conventional file processing system, data abstraction, data independence, data models(object-based, record based, physical data models), database manager, database administrator, overall system structure.

**Module 2:** Entity- Relationship model- Relationship sets, Mapping, keys and entity sets. Entity Relationship diagram, specialization, generalization and aggregation.

**Module 3:** Relational algebra- Project, select, Cartesian product, joins, natural join, union, intersection, minus, division operations.

**Module 4:** Normalization-Functional dependency, 1NF, 2NF, 3NF, BCNF, multivalued dependency & 4NF. Lossless joins, dependency preservation, redundancy control and integrity preservation during decomposition.

**Module 5:** Transaction- concepts, transaction state, concurrent executions, serializability, conflict serializability, view serializability. Concurrency control- locks, granting of locks, timestamp based protocols, deadlock prevention, detection & recovery

**Module 6:** Oracle: - Oracle functions, SQL, simple queries, nested sub-queries, self join, equijoin, non-equijoin, PL/SQL programming (Writing small blocks for data Manipulation). Update, Insert, Trigg

## Course Outcomes

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

1	Design a database for a given set of requirements.
2	Use SQL.
3	Apply normalization techniques on given database.
4	Have knowledge of 'indexing and hashing' mechanisms in a database management system.



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5	Have idea of the backend activities involved in extracting data from a database.
6	Have knowledge of transaction and concurrency control mechanisms in a database management system.

**Books Recommended:** 1. DBMS -Korth  
2. DBMS -C.J. Date  
3. Oracle –Byros

**COURSE CODE** : - **MJ-401P**  
**SUBJECT** : - **LAB of ORACLE**  
**CREDIT** : - **1**

## List of Programs as Assignments:

Consider the following tables:

emp(empno,ename,job,mgr,hiredate,sal,comm,deptno)

or dept(deptno,dname,loc)

Write the following queries:

1. List all information about all department from emp table.
2. List all employee names along with their salaries from emp table.
3. List all department numbers, employee numbers and their managers numbers in descending order of deptno from emp table.
4. List department names and locations from the dept table.
5. List the employees belonging to the department 20.
6. List the name and salary of the employees whose salary is more than 1000.
7. List the names of the clerks working in the department 20.
8. List the names of analysts and salesmen.
9. List the details of the employees who have joined before the end of September 81.
10. List the names of employees who are not managers.
11. List the names of employees whose employee number are 7369, 7521, 7839, 7934, 778
12. List the employee details not belonging to the department 10, 30, and 40.
13. List the employee name and salary, whose salary is between 1000 and 2000.
14. List the employee names, who are not eligible for commission.(salary having >15,000 eligible for commission)
15. List the employees who are eligible for commission.
16. List the details of employees, whose salary is greater than 2000 and commission is NULL.
17. List the employees whose names start with an "S" (not"s").
18. List the name, salary and PF amount of all the employees(PF is calculated as



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10% of salary).

19. List the empno, ename, sal in ascending order of salary.
20. List the employee name, salary, job and Department no descending order of Department No and salary.
21. List the employee details in ascending order of salary.
22. List the employee details in descending order of salary
23. Find the minimum salary of all employees.
24. Find the maximum, minimum, and average salaries of all employees.
25. List the maximum and minimum salary of each job type.
26. Find how many managers are in each dept.
27. Find the average salary and average total remuneration of each job type. Remember sales man earn commission.
28. Find out the difference between highest and lowest salary.
29. Find all department s which have more than three employees.
30. Check whether all employee nos are unique. ( No Duplicate)
31. List lowest paid employee working for each Manager. Exclude any groups where the minimum salary is less than 1000. Sort the output by salary.



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## SEMESTER- IV

**COURSE CODE** : - MJ-402T  
**COURSE TITLE** : - Internet Technologies  
**CREDIT** : - 3  
**TOTAL LECTURES:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** History of the Internet and World Wide Web, Search Engines, News-group, E-mail and its Protocols, Web Portal, Browsers and their versions, Its functions, URLs, web sites

**Module 2:** Static Web Development: HTML - Introduction to HTML, HTML Document structure tags, HTML comments, Text formatting, inserting special characters, anchor tag, adding images and Sound, lists types of lists, tables, frames and Developing Forms

**Module 3:** Introduction to Java Script: Data Types, Control Statements, operators, Functions, Objects in Java Script, Handling Events. Cascading Style Sheet: Types of Style Sheets – Internal, inline and External style sheets, creating styles, link tag.

**Module 4:** DHTML: Introduction to DHTML, JavaScript & DHTML, Document Object Model, DHTML Events, Dynamically change style to HTML Documents.

**Module 5:** Overview to ASP, features of asp, client side scripting vs server side scripting, web server, configuration of IIS in x windows, creation of virtual directory.

**Module 6:** Asp objects and their characteristics- Request, response, server, session, application, form method-get, post, Introduction of ADO, ADO work, oledb, odbc, query string, client certificate, connection object, recordset object

## Course Outcomes

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

1	Know the fundamentals of Internet-Technologies
2	Elaborate on the web based programming
3	Perform web based programming.
4	Design static and dynamic websites



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## Books Recommended:

1. HTML DHTML Java Script VB Script – Ivan Bayross
2. Black Book : Holzner

## SEMESTER- IV

**COURSE CODE** : - **MJ-402P**  
**SUBJECT** : - **LAB of Internet Technologies**  
**CREDIT** : - **1**

### Lab of Internet Technologies as assignment

1. India is a large country. Different regions observe variations in climate. The spoken language of one state is quite different from that of another. They wear different types of garments. They celebrate different festivals and perform varied religious rites. People belonging to diverse cultures belong to different religious faiths. In spite of these diversities, Indians feel a sense of unity and oneness among them. Thus, we conclude that India is a land of Unity in Diversity.
  - a) All the headings should be H2 and green colour.
  - b) Main heading should be H1 and centre aligned.
  - c) The background should be yellow colour.
  - d) There are 10 paragraphs so each of them should be made using P tag.
  - e) The Introduction and Conclusion paragraphs should have “Times New Roman” font, the size should be 12 and colour should be blue.
  - f) All the remaining paragraphs text should be pink and magenta coloured in an alternate way.
  - g) There should be one meaningful picture in the web page with specific dimension.
2. Create a webpage having 10 divisions each having separate background color and text color using <DIV> tag. At the top right corner there should be an image hyperlink opening in a new webpage.
3. Create a webpage with a form loaded into it and take input of three strings through three textboxes and then concatenate them without using any built-in function.
4. Create a webpage with two tables. First one should have 1 row and 5 columns and the second one with 3 rows and 4 columns. The contents of the first table should be center





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aligned and contents of the second table should be right aligned. Each column of the first table should have separate colors and each row of the second table should have separate colors.

5. Write a JavaScript program to calculate and display the aggregate and percentage of three subjects' (Physics, Chemistry and Mathematics) marks along with the name of a student. The name and individual marks input shall be taken by textbox in the webpage.
6. Write a JavaScript program to search the element 4 in the array [2, 6, 4, 10, 4, 0, -2] using any method.
7. Create a webpage to take input of a string and check whether it is a palindrome or not.
8. Write a program using JavaScript to take input of an array of numbers like [-4, 5, 6, -1, 10] and then sort it in descending order.
9. Create a webpage to take input of a string and reverse that without using any user defined function.
10. Write a JavaScript program to search 10 in the array [2, 6, -5, 10, 11, 0, -2] using a binary search method.
11. Write a JavaScript program to take two arrays like [3, 7, 1, 6, 2, 3] and [5, 6, 0, -3] and merge them into third array along with that remove the repetitive elements.
12. Write a JavaScript program to calculate the percentage of three subjects' (English, Mathematics, and Science) marks along with the name of a student. The name and individual marks input shall be taken by form in the webpage.
13. Create a webpage to take input of a string and count the number of vowels in it.
14. Create a webpage to take input of two strings and concatenate them without using any built-in function.
15. Create a webpage to take input of a string and then slice it into three separate strings and display that.
16. Write a JavaScript program to take two arrays like [1, 3, 8, 1, 6, 2, 3] and [2, 1, 5, 6, 0, -3] and merge them into third array along with that remove the repetitive elements.
17. Write a JavaScript program to calculate and display the aggregate and percentage of three subjects' (Physics, Chemistry and Mathematics) marks along with the name of a student. The name and individual marks input shall be taken by textbox in the webpage.
18. Create a webpage to take input of a string and check whether it is a palindrome



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## SEMESTER-IV

**COURSE CODE** :- MJ-403T  
**COURSE TITLE** :- COMPUTER NETWORKS  
**CREDIT** :- 3  
**TOTAL LECTURES:-** 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Basic network concepts, advantages and disadvantages of computer networks, types of networks-LAN, WAN, MAN LAN Technology: LAN architecture, Bus/Tree LAN, Ring & Star LANs Network topologies, Hardware requirement of a network, Network operating system. A communication model, communication tasks, three-layer approach to protocols, and brief introduction to TCP/IP and OSI (brief function to different layers), Bridge, Router

**Module 2:** Concept and terminology, analog and digital data transmission. Transmission impairments, Guided transmission media, Asynchronous & synchronous transmission. Data encoding, digital data digital signal, digital data analog signal, analog data digital signal, and analog data analog signal

**Module 3:** Flow control, Error detection (CRC). Error control, High-level data control (HDLC). Multiplexing, multiplexing (frequency division multiplexing, time-division multiplexing, wavelength division multiplexing)

**Module 4:** Circuit switching and Packet switching: switched network, circuit switching networks, packet switching principals, routing, congestion and control Ethernet:- Standard Ethernet and Fast Ethernet, Aloha (pure Aloha and Slotted Aloha), CSMA, CSMA/CD, CSMA/CA, Token ring and FDDI.

**Module 5: Network layer:** Networks and Internetworks, virtual circuits and datagrams, addressing, subnetting, Routing algorithm (Distance vector and Dijkstra routing), Network Layer protocol- (ARP, IPV4, ICMP, IPV6).

**Module 6: Transport and Application Layer:** Process to process Delivery- (client-server paradigm, connectionless versus connection-oriented service, reliable versus unreliable); User Datagram Protocols, TCP/IP protocol, Flow Control. FTP (File Transfer Protocol), SMTP (Simple Mail Transfer Protocol), Telnet (Remote login protocol), WWW (World Wide Web), HTTP (Hyper Text Transfer Protocol), and URL (Uniform Resource Locator).

(Numerical-related questions are to be asked)

### Course Outcomes

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



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1	Understand and be able to explain the principles of a layered protocol architecture; be able to identify and describe the system functions in the correct protocol layer and further describe how the layers interact.
2	Understand, explain and calculate digital transmission over different types of communication media.
3	Understand and explain for data-link and network protocols.
4	Describe the principles of access control to shared media.

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**Book Recommended** 1. Data Communication and Networking: Tannenbaum

2. Data Communication and Networking: Frozen

## SEMESTER-IV

**COURSE CODE** : - **MJ-403P**  
**COURSE TITLE** : - **LAB of COMPUTER NETWORKS**  
**CREDIT** : - **1**

### SECTION I

1. Explain the following networking protocols with their syntax. Ping, ipstat, http, ftp, ip config, netstat, lpr.

2. Configure TCP

3. Configure Router 4.

Configure Remote Machine

5. Internetworking devices:- NIC, Modems, Repeaters, Routers, Hubs, Bridges, Switches and Gateways.

### SECTION II

1. Simulate Cyclic Redundancy Check (CRC) error detection algorithm for noisy channel.

2. Simulate and implement stop and wait protocol for noisy channel.

3. Simulate and implement go back n sliding window protocol.

4. Simulate and implement selective repeat sliding window protocol.

5. Simulate and implement distance vector routing algorithm

6. Simulate and implement Dijkstra algorithm for shortest path routing.



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## SEMESTER-V

**COURSE CODE** : - MJ-501T  
**COURSE TITLE** : - Programming using Python  
**CREDIT** : - 3  
**TOTAL LECTURES:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** History of Python, Usage of Python, Features of Python, Structure of python program

**Module 2:** Variables, Data types, Keywords, Literals and operators in Python, python comments

**Module 3:** Control Statement: if-else, loop, for loop, while, break, and continue statements.

**Module 4:** Python pass, Python Strings, Python lists, python tuple, python set, python dictionary. Python functions, Built in functions, Lambda functions,

**Module 5: Object Oriented Programming:** Introduction to classes, objects and methods; Standard libraries.

**Module 6 File and exception handling:** File handling through libraries; Errors and exception handling.

### **Book Recommended**

1. Taneja, S., Kumar, N. *Python Programming- A modular Approach*, 1<sup>st</sup> edition, Pearson Education India, 2018.
2. Balaguruswamy E. *Introduction to Computing and Problem Solving using Python*, 2<sup>nd</sup> edition, McGraw Hill Education, 2018.

### Course Outcomes

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

1	Create your first program in Python IDLE.
2	Implement OOPs concepts in your programming.
3	Use Arrays, and Data structures.
4	Create an application with the support of graphics in Python.



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## SEMESTER-V

**COURSE CODE** : - MJ-501P  
**COURSE TITLE** : - Lab based on Python  
**CREDIT** : - 1

### SECTION-I (SIMPLE PROGRAMS)

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice.
2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :
  - a. Grade A: Percentage  $\geq 80$
  - b. Grade B: Percentage  $\geq 70$  and  $< 80$
  - c. Grade C: Percentage  $\geq 60$  and  $< 70$
  - d. Grade D: Percentage  $\geq 40$  and  $< 60$
  - e. Percentage  $< 40$
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. WAP to display the first n terms of Fibonacci series.
5. WAP to find factorial of the given number.
6. WAP to find sum of the following series for n terms:  $1 - 2/2! + 3/3! - \dots - n/n!$
7. WAP to calculate the sum and product of two compatible matrices.

### SECTION-II (VISUAL PYTHON)

*All the programs should be written using user defined functions, wherever possible.*

1. Write a menu-driven program to create mathematical 3D objects
  - i. curve
  - ii. sphere
  - iii. cone
  - iv. arrow
  - v. ring
  - vi. cylinder
2. WAP to read n integers and display them as a histogram.
3. WAP to display sine, cosine, polynomial and exponential curves.
4. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.



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5. WAP to calculate the mass  $m$  in a chemical reaction. The mass  $m$  (in gms) disintegrates according to the formula  $m=60/(t+2)$ , where  $t$  is the time in hours. Sketch a graph for  $t$  vs.  $m$ , where  $t \geq 0$ .
6. A population of 1000 bacteria is introduced into a nutrient medium. The population  $p$  grows as follows:

i.  $P(t) = (15000(1+t))/(15 + e^t)$

where the time  $t$  is measured in hours. WAP to determine the size of the population at given time  $t$  and plot a graph for  $P$  vs  $t$  for the specified time interval.

7. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
  - i. velocity wrt time ( $v=u+at$ )
  - ii. distance wrt time ( $s=u*t+0.5*a*t*t$ )
  - iii. distance wrt velocity ( $s=(v*v-u*u)/2*a$ )



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## SEMESTER- V

**COURSE CODE :- MJ-502T**  
**COURSE TITLE :- OBJECT ORIENTED MODELING AND DESIGN**  
**CREDIT :- 3**  
**TOTAL LECTURES: - 45**

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1: Introduction:** What Is Object-Oriented? What Is Object Oriented Development? Object Oriented Theme. **Modeling as a Design Technique:** Modeling, Abstraction, The three model

**Module 2: Class Modeling:** Object and class concepts, link and association concepts, Generalization and inheritance, a sample class model. **Advanced class Modeling:** Aggregation, abstract classes, multiple inheritances, metadata, and constraints.

**Module 3: State Modeling:** Events, states, state diagrams. **Advanced states Modeling:** Nested state diagrams, nested states, concurrency, a sample state model.

**Module 4: Interaction Modeling:** Use case models, sequence models, activity models, Data Flow Diagrams **Process Overview:** Development states, Development life cycle.

**Module 5: System Design:** Overview of system design, breaking a system into subsystems, indentify concurrency, allocation of subsystems, management of data storage, handling global resources, choosing a software control strategy, handling boundary conditions, setting trade-off priorities, common Architectural styles, architecture of the ATM system.

**Module 6: Programming style:** Object-Oriented Style, Reusability, Extensibility, Robustness, Programming – in-the-Large.

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## Course Outcomes

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

1	To analyze and model software specifications.
2	To abstract object-based views for generic software systems.
3	To deliver robust software components.

## **Book Recommended:**

Michael R Blaha and James R Rumbaugh– Object Oriented Modeling and Design, PHI, New Delhi, 2003



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## SEMESTER- V

**COURSE CODE** : - **MJ-502P**  
**SUBJECT** : - **LAB of Object Oriented Modelling and Design**  
**CREDIT** : - **1**

### **Lab of UML as assignment**

1. Draw use case diagram for online banking system.
2. Draw use case diagram for online library system
3. Draw use case diagram for online railway reservation system
4. Draw use case diagram for employee information system.
5. Draw sequence diagram for online banking system
6. Draw sequence diagram for online library system.
7. Draw sequence diagram for online railway reservation system.
8. Draw sequence diagram for employee information system.
9. Draw activity diagram for online banking system.
10. Draw activity diagram for online library system.
11. Draw activity diagram for online railway reservation system.
12. Draw activity diagram for employee information system.
13. Draw class diagram for online banking system.
14. Draw class diagram for online library system
15. Draw class diagram for employee information system.
16. Draw class diagram for inventory control system





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## SEMESTER- V

**COURSE CODE** : - MJ-503T  
**COURSE TITLE** : - COMPUTER GRAPHICS  
**CREDIT** : - 3  
**TOTAL LECTURE:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Overview of Graphics systems: Video display devices, refresh cathode ray tubes, raster-scan and random-scan display, colour CRT monitor, direct view storage tubes, random scan system.

**Module 2:** Lines: line drawing algorithm, DDA and Bresenham's Line drawing algorithm, Programs  
Circle: DDA, Bresenham's and midpoint circle drawing algorithm, Program in C

**Module 3:** Ellipse generating algorithm, Bezier curve, spline curves, pixel addressing, filled area, Scan-line algorithm, boundary fill and flood-fill algorithm.

**Module 4:** Two-dimensional geometric transformation: Basic transformation, matrix representation, composite transformation (translation, rotation, & scaling).

**Module 5:** Raster methods for transformation, viewing pipeline, viewing coordinates frame, clipping (points, line & polygon), Cohen Sutherland line clipping algorithm.

**Module 6:** Visible surface detection methods: Classification of visible surface detection algorithm, back face detection algorithm, depth buffer algorithm.

## Course Outcomes

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

1	Can perform visual computations for geometrical drawings.
2	Can model 2D objects.
3	Apply geometrical transformation of the modelled objects.
4	Can develop simple Graphical User Interface.

## **Books Recommended:**

1. Computer Graphics – Hearn & Baker
2. Computer Graphics – RDS Asthana



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## SEMESTER- V

**COURSE CODE** : - **MJ-503P**  
**SUBJECT** : - **LAB of Computer Graphics**  
**CREDIT** : - **1**

1. Program of DDA line drawing algorithm
2. Program of Bresenham's line drawing algorithm
3. Program of DDA circle drawing algorithm
4. Program of Bresenham's circle drawing algorithm.
5. Program of Mid-point Circle drawing algorithm,
6. Program of flood fill algorithm.
7. Write a program to clip a line using Cohen and Sutherland line clipping algorithm.
8. Write a program to clip a polygon using Sutherland Hodgeman algorithm.
9. Write a program to apply various 2D transformations on a 2D object (use homogenous coordinates).



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## SEMESTER- V

**COURSE CODE** : - **INT-501P**  
**COURSE TITLE** : - **INTERNSHIP**  
**CREDIT** :- **4**

Students are advised to pursue the Internship Course in the following period:

- I. Break between II & III Semester of one paper containing 4 Credits (Compulsory for all students) or
- II. Break between IV & V Semester of one paper containing 4 Credits (Compulsory for all students) or
- III. During V Semester of one paper containing 4 Credits (Compulsory for all students).

### **INTERNSHIP GUIDELINES**

**Internship:** A course requiring students to participate in a professional activity or work experience, or cooperative education activity with an entity external to the education institution, normally under the supervision of an expert of the given external entity. A key aspect of the internship is induction into actual work situations. Internships involve working with local industry, government or private organizations, business organizations and similar entities to provide opportunities for students to actively engage in on-site experiential learning.

The main reason students need to do internship is so they are well prepared for a graduate job in their chosen field. It is a chance for you to put what you have learned at university to work in the kind of real-life situations you will come up against when you start your career. internship gives you great experience during your degree including:

- First-hand experience working as a professional Developer.
- Apply your technical knowledge to a real-life situation.
- Work with other professionals related to your industry.
- Experience what it's like to work in a professional organisation.
- Increase your technical, interpersonal and communication skills.
- Observe interactions of engineers with other professional groups.



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- Witness the functioning and organisation of business and companies

Student have to do 60 hours industrial Training from two different IT organizations. Student has to produce daily report. In this daily report, Attendee sheet, Work culture and working hour list day by day, must be listed.

Internal Assessment-50

External Assessment-50

**Academic Credits for training shall be based on following:**

A Power Point presentation (based on the report) for duration of 10 minutes should be make. This will be presented in front of examiners. Marks will be awarded on this presentation and documents submitted.



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## SEMESTER- VI

**COURSE CODE** : - MJ-601T  
**COURSE TITLE** : - PHP Programming  
**CREDIT** : - 3

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Introduction to PHP:PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.) PHP with other technologies, scope of PHP Basic Syntax,

**Module 2:**PHP variables and constants,Types of data in PHP , Expressions, scopes of a variable (local, global)PHP Operators : Arithmetic, Assignment, Relational , Logical operators, Bitwise , ternary and MOD operator.

**Module 3:** Handling HTML form with PHP, Capturing Form Data, GET and POST form methods  
Dealing with multi value fields, Redirecting a form after submission

**Module 4:** PHP conditional events and Loops PHP IF Else conditional statements ( Nested IF and Else) Switch case, while ,For and Do While Loop ,Goto , Break ,Continue and exit

**Module 5:** PHP Functions: Function, Need of Function , declaration and calling of a function  
PHP Function with arguments, Default Arguments in Function Function argument with call by value, call by reference,Scope of Function :Global and Local

**Module 6:** Database Connectivity with MySql Introduction to RDBMS, Connection with MySql Database, Performing basic database operation(DML) (Insert, Delete, Update, Select), Setting query parameter, Executing queryJoin (Cross joins, Inner joins, Outer Joins, Self joins

### **Books Recommended:**

1. Steven Holzner, "PHP: The Complete Reference Paperback", McGraw Hill Education (India), 2007.
2. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL (Create-Modify-Reuse)", Wiley India PrivateLimited, 2008.



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## Course Outcomes

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

1.	Construct PHP scripts to create dynamic web content
2.	Create PHP scripts capable of inserting and modifying data in a MySQL database.
3.	Design web pages with the ability to retrieve and present data from a MySQL database.

## SEMESTER-VI

**COURSE CODE** :- **MJ-601P**  
**COURSE TITLE** :- **Lab Based on PHP Programming**  
**CREDIT** :- **1**

### Lab Based on PHP Programming

1. Create a PHP page using functions for comparing three integers and print the largest number.
2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
3. WAP to check whether the given number is prime or not.
4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
5. Write a PHP function that checks if a string is all lower case.
6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
7. WAP to sort an array.
8. Write a PHP script that removes the whitespaces from a string.
  - a. Sample string : 'The quick " " brown
  - b. fox' Expected Output :
  - c. Thequick""brownfox
9. Write a PHP script that finds out the sum of first n odd numbers.
10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e. name is present in the database) otherwise error message should be displayed.
11. Write a simple PHP program to check that emails are valid



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## SEMESTER- VI

**COURSE CODE** : - MJ-602T  
**COURSE TITLE** : - SOFTWARE ENGINEERING  
**CREDIT** : - 3  
**TOTAL LECTURES:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module-1 Introduction:** Software Engineering - A Layered Approach; Software Process – Process Framework, Umbrella Activities; Process Models – Waterfall Model, Incremental Model, and Evolutionary process Model (Prototyping, Spiral Model); Introduction to Agile, Agile Model – Scrum.

**Module-2 Software Requirements Analysis and Specification:** Use Case Approach, Software Requirement Specification Document, Flow-oriented Model, Data Flow Model.

**Module-3 Design Modeling:** Translating the Requirements model into the Design Model, The Design Process, Design Concepts - Abstraction, Modularity, and Functional Independence; Structure Charts.

**Module-4 Software Metrics and Project Estimation:** Function-based Metrics, Software Measurement, Metrics for Software Quality; Software Project Estimation (FP-based estimations); Project Scheduling (Timeline charts, tracking the schedule),

**Module-5 Quality Control and Risk Management:** Quality Control and Quality Assurance, Software Process Assessment and Improvement; Software Risks, Risk Identification, Risk Projection, Risk Mitigation, Monitoring, and Management.

**Module-6 Software Testing:** Strategic Approach to Software Testing, Unit Testing, Integration Testing, Validation Testing, System Testing; Black-Box and White Box Testing, Basis Path Testing

## Course Outcomes

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

1	Understand the software development models.
2	Analyze and model customer requirements and build design models.
3	Estimate and prepare schedule for software projects.



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4	Analyze the impact of risks involved in software development.
5	Design and build test cases, and to perform software testing.

### BOOKS RECOMMENDED

1. Pressman, R.S. *Software Engineering: A Practitioner's Approach*, 9<sup>th</sup> edition, McGraw-Hill, 2020.
2. Aggarwal, K.K., Singh, Y. *Software Engineering*, 3<sup>rd</sup> edition, New Age International Publishers, 2007.

### SEMESTER- VI

**COURSE CODE** : - **MJ-602P**  
**COURSE TITLE** : - **SOFTWARE ENGINEERING**  
**CREDIT** : - **1**

Understanding SRS (Elements of SRS), Creation of SRS according to IEEE standard.

Case Study of-

1. Online Retail Shopping Management System.
2. Online Hotel Reservation System.
3. Examination & Result Computation System.
4. Automatic Internal Assessment System.
5. Parking allocation system.
6. Whole Sale Management System





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## SEMESTER- VI

**COURSE CODE** : - MJ-603T  
**COURSE TITLE** : - DATA WAREHOUSE AND DATA MINING  
**CREDIT** : - 3  
**TOTAL LECTURES:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Overview and Concepts of Data Warehousing, Overview of Data warehousing Strategic information and the need for Data warehousing, Defining a Data warehouse, Evolution of Data warehousing, Characteristics of Datawarehouse, The Building Blocks of Data warehouse

**Module 2:** A Multidimensional Model: From tables and Spreadsheets to Data cube, Stars, Snowflakes and Fact Constellation, Datawarehouse vs Data Mart, OLAP Operations in the Multidimensional Data Model

**Module 3:** Data Warehouse Architecture: Steps for the Design and Construction of Data Warehouse, The process of Data Warehouse Design, A three tier Data Warehouse Architecture, Metadata Repository, Types of OLAP Servers: ROLAP vs MOLAP vs HOLAP

**Module 4 :** Data Mining : Define Data mining, Reason for using Data Mining, Evolution of Data Mining, KDD vs Data Mining, Architecture of Data Mining System

**Module 5:** Data Mining Functionalities: Associations and Correlations, Classifications and Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis

**Module 6:** Introduction to Data Preprocessing, Need for processing the Data; Descriptive Data Summarization: Measuring the central Dependency, Measuring the Dispersion of Data; Data Cleaning: Missing values, Noisy Data, Data Cleaning as process Data Integration and Transformation: Data Integration, Data Transformation;

### Course Outcomes

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



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Website: [www.dspmuranchi.ac.in](http://www.dspmuranchi.ac.in)

1	Identify data mining related applications and activities
2	Get knowledge about the Introduction of Datawarehouse and its Architecture
3	Mathematically perform pre-processing operations on datasets to ensure the validity of the data is improved.
4	Analyze and evaluate for performing common data mining
5	Apply Data mining methods for performance and optimization issues

## **Books Recommended:**

1. Data Warehousing Fundamentals for IT Professionals, Second Edition by Paulraj Ponniah, Wiley
2. Data Warehousing, Data Mining, & OLAP - Second Edition by Alex Berson and Stephen J. Smith, Tata McGraw Hill Education

## **SEMESTER- VI**

**COURSE CODE** : - **MJ-603P**  
**COURSE TITLE** : - **DATA WAREHOUSE AND DATA MINING**  
**CREDIT** : - **1**

1. Basics of WEKA tool a. Investigate the Application interfaces. b. Explore the default datasets.
2. Pre-process a given dataset based on the following: a. Attribute Selection b. Handling Missing Values
3. Pre-process a given dataset based on the following: a. Discretization b. Eliminating Outliers
4. Create a dataset in ARFF (Attribute-Relation File Format) for any given dataset and perform Market-Basket Analysis.
5. Generate Association Rules using the Apriori algorithm.
6. Generate Association Rules using the FP-Growth algorithm.
7. Build a Decision Tree using ID3 algorithm.
8. Demonstrate classification process on a given dataset using Naïve Bayesian Classifier.
9. Demonstrate classification process on a given dataset using Rule based Classifier.
10. Demonstrate classification process on a given dataset using Nearest neighbor Classifier.



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## SEMESTER- VI

**COURSE CODE :- MJ-604T**  
**COURSE TITLE :- PROJECT WORK**  
**CREDIT :- 3**  
**TOTAL LECTURES: - 45**

**Internal Assessment: 35 Marks**

**External Assessment: 40 Marks**

### **PROJECT WORK/ DISSERTATION:**

1. The students will be allowed to work on any project based on the concepts studied in core / elective or skill based elective courses.
2. Student have to do a complete project, the technologies (front end + back end) should be chosen among the syllabus, where the front end will be designing & coding portion and back end will be database portion.
3. Student have to run the code as a live project and submit CD containing supporting software, frontend and backend coding in proper format.

Guidelines to Examiners for

End Semester Examination (ESE Pr):

Project Evaluation (By Internal & External) may be as per the following guidelines:

Assigned by Internal Guide

Pre-Submission (Power Point Presentation) = 35marks

Assigned by External Examiner

Programme Running in system = 20 marks

Project Report (Hard Copy) = 10 marks

Viva-voce = 10 marks

### **PROJECT GUIDELINES**

Student must follow the below guidelines

1. Synopsis Submission
2. Synopsis Approval will be given within a week from the date of submission



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3. A Power Point presentation (based on the report) for the duration of 10 minutes should be make. This will be presented in front of Examiners.
4. Faculty members will be the internal guide of each students.
5. Synopsis contains
  - a) Title of the Project.
  - b) Introduction of the Project.
  - c) Objective of the Project.
  - d) Platform used (Hardware/Software).
  - e) Module of the project.
  - f) Project Type
  - g) System Design
    - I. Data Flow Diagram.
    - II. Entity-Relationship Diagram.
    - III. Object Diagram.
    - IV. Class Diagram.
    - V. Gantt and Pert Chart.
    - VI. Activity diagram.
    - VII. Collaboration diagram.
  - h) Conclusion.
  - i) Limitation of the Project.
  - j) Future Scope of the Project.
6. Final Project Submission contains Hardcopy and Softcopy  
Project Hardcopy contains
  - a) Front page
  - b) Certificate of Authenticity
  - c) Certificate of Internship



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- d) Declaration
- e) Acknowledgement
- f) Table of content/index
- g) Project Guidelines
  - i. Introduction
  - ii. Vision, mission, objective
  - iii. Swot analysis
  - iv. Chronology of Achievements.
  - v. Topic discussion
  - vi. Platform used (Hardware/Software).
  - vii. Module of the project.
  - viii. Project Type
  - ix. System Design
    - a) Data Flow Diagram.
    - b) Entity-Relationship Diagram.
    - c) Object Diagram.
    - d) Class Diagram.
    - e) Gantt and Pert Chart.
    - f) Activity diagram
    - g) Collaboration diagram
  - x. Its relevance and implication in company.
  - xi. Finding
  - xii. Conclusion
  - xiii. Limitation of the project
  - xiv. Further Enhancement
  - xv. Bibliography



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7. Project that assigned to the student should be executed (run) during viva of project Dissertation.
8. Documentation of Synopsis/ Project must be well formatted.
9. Main text of Synopsis/ Project should be typed on A4 size paper in Font Times New Roman (Size 12) with margin: Left 1.5", Right: 1", Top: 1", Bottom: 1" and arranged in suitable sections like introduction, Problem Definition, Computational / Design, Results and Discussion, Conclusion, Future Scope of Work, References, Appendix (if any). The Project must be hard cover bound.
10. Contents of the final project also include coding and snapshot of the executed project.
11. Contents of the synopsis and final project must not copied from any website.

## SEMESTER- VI

**COURSE CODE** :- **MJ-604P**  
**COURSE TITLE** :- **Lab on Project Work**  
**CREDIT** :- **1**

**i) Documentation of project work**

**ii) Viva-Voce**



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## SEMESTER- VII

**COURSE CODE** : - **MJ-701T**  
**COURSE TITLE** : - **Advance Java Programming**  
**CREDIT** : - **3**  
**TOTAL LECTURES:** - **45**

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module-1** Introduction to JSP: Introducing Java Server Pages Technology, JSP Architecture, JSP Actions. Introduction to the JSP tags, Detail introduction to JSP Declaratives, Detail Introduction to JSP Scriptlets and JSP Expressions with examples Writing the Date JSP, Reading the Request Information, Retrieving the data posted to a JSP file from HTML file

**Module-2:** Accessing database from JSP Implement JavaScript with JSP Working with JSP Sessions, JSP Cookies .

**Module 3:** Overview of Servlet: Servlet, Method of servlet, Life cycle of servlet, Features of Servlet, Advantages of servlet, Introduction to server side programming, Running a sevlet

**Module 4:** Passing parameter using Html form, Multiple values for a single parameter, Send redirect in servlet, Session Tracking.

**Module 5:** Connection with the database: Inserting data in database table using statement, Retrieving data from the table using prepared statement, Getting columns names using servlets, Deleting rows from table ,Get and post method of Http, Servlets links, sendRedirect

### Course Outcomes

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

1.	Provide a precepts and practices, in a field that is of immense concern to the industry and business
2.	Design and develop GUI applications



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## SEMESTER- VII

**COURSE CODE : - MJ-701P**  
**COURSE TITLE : - LAB ON JSP and SERVLET**

1. Write a program in JSP to display “Hello, World!”.
2. Find the sum of two numbers using JSP.
3. Write a program in JSP to display the given text in a paragraph in different font sizes using a loop.
4. Create a dynamic web application in JSP to find the grade according to the marks entered by the user using the switch statement.
5. Build an application in JSP to calculate factorial of a number using recursion.
6. Write a program to create a JSP method that accepts a number and returns its double.
7. Use Page directive in JSP to display the current date.
8. Create a summation method in JSP that accepts an array and display the sum of its element.
9. Write a program to create a JSP page called alert message JSP that displays alert messages if username & password fields are blank and displays welcome user otherwise.
10. Develop an application to demonstrate the include directive in JSP to display the current date from another JSP page.
11. Write a program in JSP to display the properties of an object using the useBean directive.
12. Build an application in JSP that redirects to another page.
13. Write a program to create a servlet that displays the welcome message.
14. Create a simple interest calculator web page using a servlet.
15. Develop a dynamic web application using servlets to create and display cookies.
16. Create a registration form and display the values entered by the user in another page using servlets.





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## SEMESTER- VII

**COURSE CODE** : - **MJ-702T**  
**COURSE TITLE** : - **CYBER SECURITY**  
**CREDIT** : - **3**  
**TOTAL LECTURES:** - **45**

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Cyber Security: Introduction of cyber security, History of cyber security, Types of cyber security, the importance of cyber security, Goals of cyber security

**Module 2:** Cyber Attacks: Classification of cyber-attacks, MITM attacks, Types of cyber-Attackers, Cyber security principles

**Module 3:** Data Security consideration: Backups, Archival of data and Disposal of data.

**Module 4:** Security Technologies: Firewall and VPN, Intrusion Detection, Access Control

**Module 5:** Security Threats to Ecommerce: electronic payments system, e-cash, data misuse, credit/debit card frauds; Security Policies: Need of security policies

**Module 6:** Cyber Security Standards, Cyber Security Digital Signature, Types of Digital Signature

**Module 7:** Cyber Security tools: Firewalls, anti-virus software, PKI Services, Managed detection and Response Service; Cyber Security challenges

**Module 8:** Cyber Security Risk Analysis, Benefits of Risk Analysis, Types of Risk Analysis, Email Security, Needs of Secure Email Service

### Course Outcomes

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

1	Analyze and resolve security issues in networks and computer systems to secure an IT infrastructure.
2	Design, develop, test and evaluate secure software.
3	Develop policies and procedures to manage enterprise security risks.
4	Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training.



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## Books Recommended

1. C. P. Pfleeger, S. L. Pfleeger; Security in Computing, Prentice Hall of India, 2006
2. W. Stallings; Network Security Essentials: Applications and Standards, 4/E, 201

## SEMESTER- VII

**COURSE CODE** : - **MJ-702P**  
**COURSE TITLE** : - **LAB ON CYBER SECURITY**  
**CREDIT** :- **1**

1. Demonstrate the use of Network tools: ping, ipconfig, ifconfig, tracert, arp, netstat, whois
  2. Use of Password cracking tools : John the Ripper, Ophcrack. Verify the strength of passwords using these tools.
  3. Perform encryption and decryption of Caesar cipher. Write a script for performing these operations.
  4. Perform encryption and decryption of a Rail fence cipher. Write a script for performing these operations. Use nmap/zenmap to analyse a remote machine.
  5. Use Burp proxy to capture and modify the message.
  6. Demonstrate sending of a protected word document.
  7. Demonstrate sending of a digitally signed document.
  8. Demonstrate sending of a protected worksheet.
  9. Demonstrate use of steganography tools.
  10. Demonstrate use of gpg utility for signing and encrypting purposes.
-



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## SEMESTER- VII

**COURSE CODE** : - MJ-703T  
**COURSE TITLE** : - ARTIFITIAL INTELLEGENCE  
**CREDIT** : - 3  
**TOTAL LECTURES:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Introduction: Objective, Scope and outcome of the course, Meaning and definition of artificial intelligence, Physical Symbol System Hypothesis, production systems, Characteristics of production systems. Breadth first search and depth first search techniques. Heuristic search Techniques: Hill Climbing, Iterative deepening DFS

**Module 2:** Breadth first search and depth first search techniques. Heuristic search Techniques: Hill Climbing, Iterative deepening DFS

**Module 3:** Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic logical consequences, syntax and semantics of an expression, semantic Tableau Nonvolatile data

**Module 4:** Network-based representation and reasoning, Semantic networks, Conceptual Graphs, frames. Description logic (DL), concept language, reasoning using DL. Conceptual dependencies (CD), scripts, reasoning using CD. Introduction to natural language processing.

Automated planning, classical planning problem, forward planning, partial order planning, planning with proposal logic, hierarchical task planning, multiagent planning.

**Module 5:** Automated planning, classical planning problem, forward planning, partial order planning, planning with proposal logic, hierarchical task planning, multiagent planning.

**Module 6:** Reasoning in uncertain environments, Fuzzy logic, fuzzy composition relation, operations on fuzzy sets

### Course Outcomes

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



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1	Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
3	Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
4	Demonstrate proficiency developing applications in an 'AI language', expert system shell, or datamining tool.
5	Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications

## Books Recommended: -

1. Artificial Intelligence: Elaine Rich, Kevin Knight, Mc-Graw Hill.
2. Introduction to AI & Expert System: Dan W. Patterson, PHI.
3. Artificial Intelligence by Luger (Pearson Education)
4. Russell & Norvig, Artificial Intelligence: A Modern Approach, Pearson Education

## SEMESTER- VII

**COURSE CODE : -MJ-703P**

**COURSE TITLE : - LAB ON ARTIFICIAL INTELLIGENCE**

1. Write a prolog program to calculate the sum of two numbers.
2. Write a prolog program to find the maximum of two numbers.
3. Write a prolog program to find the  $n^{\text{th}}$  Fibonacci series.
4. Write a prolog program to find the factorial of a number.
5. Write a prolog program to implement GCD of 2 numbers.
6. Write a prolog program to implement palindrome.
7. Write a prolog program to implement reverse (list, reversed list) that reverses list.
8. Write a prolog program to implement append for two list.
9. Write a Prolog program to implement palindrome(List).



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## SEMESTER- VII

**COURSE CODE :- MJ-704T**  
**COURSE TITLE :- E-Commerce and Application**  
**CREDIT :- 3**  
**TOTAL LECTURE: - 45**

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Introduction to e-commerce, Advantages and Disadvantage of Ecommerce, Types of E-Commerce EDI-electronic data interchange, Benefits of EDI, Component of EDI System.

**Module 2:** Introduction to UN/EDIF ACT standard, An EDIFACT Message, Interchange Structure, Un/EDIFACT message Directories.

**Module 3:** Internet & Extranets, Commerce over the Internet, Commerce over the Extranet Identification & tracking tools, EAN system, Eancom, Article numbering, bar Coding.

**Module 4:** Business process Re-engineering, Strategic Alignment Model BPR Methodology. Rapid Re Methodology, Management of change

**Module 5:** Concerns for e-commerce growth – Legal issues, Risks, Technology for Authenticating Electronics Document, Laws for E-Commerce, Legal issues for internet commerce.

**Module 6:** Cyber security, Cyber attacks, Hacking, Firewalls, cryptography based solutions, Digital Signature

**Module 7:** Cyber crimes, Information Technology act 2000, Public Key Infrastructure, PKI and Certifying Authorities

**Module 8:** Electronic payment system, Payment gateway and Internet banking, Pay pal, Secure Electronic Transaction (SET) protocol

## Course Outcomes

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

1	Able to learn E- Commerce perspectives.
2	Able to learn Electronic Data Interchange.
3	Able to learn Security majors of E- Commerce.
4	Able to Manage & Learn Electronic Payment system.
5	Able to use & Manage Internet Advertisements.



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## Books Recommended :

- 1.K. K. Bajaj & D. Nag – TMH
- 2.Rayport & Jawors

## SEMESTER- VII

**COURSE CODE** :- **MJ-704P**  
**COURSE TITLE** :- **LAB of E-Commerce and Application**

CASE STUDY ON E-COMMERCE, APPLICATION OF E-COMMERCE



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## SEMESTER- VIII

**COURSE CODE** : - MJ-801T  
**COURSE TITLE** : - DIGITAL IMAGE PROCESSING  
**CREDIT** : - 3  
**TOTAL LECTURE:** - 45

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

### **Module 1: Fundamentals**

Need for DIP- Fundamental steps in DIP – Elements of visual perception -Image sensing and Acquisition – Image Sampling and Quantization – Imaging geometry, discrete image mathematical characterization.

### **Module 2: Image Transforms**

Two-dimensional Fourier Transform- Properties – Fast Fourier Transform – Inverse FFT, Discrete cosine transform and KL transform. -Discrete Short time Fourier Transform- Wavelet Transform- Discrete wavelet Transform- and its application in Compression.

### **Module 3: Image Enhancement**

**Spatial Domain:** Basic relationship between pixels- Basic Gray level Transformations – Histogram Processing – Smoothing spatial filters- Sharpening spatial filters. **Frequency Domain:** Smoothing frequency domain filters- sharpening frequency domain filters Homomorphic filtering.

### **Module 4: Image Restoration:**

Overview of Degradation models –Unconstrained and constrained restorations-Inverse Filtering, Wiener Filter.

### **Module 5: Feature Extraction:**

Detection of discontinuities – Edge linking and Boundary detection- Thresholding- -Edge based segmentation-Region based Segmentation- matching-Advanced optimal border and surface detection- Use of motion in segmentation. Image Morphology – Boundary descriptors- Regional descriptors.

### **Module 6: Image Reconstruction from Projections:**

Need- Radon Transform – Back projection operator- Projection Theorem- Inverse Radon Transform.

### **Book Recommended: -**

1. Rafael C.Gonzalez & Richard E.Woods – Digital Image Processing – Pearson Education- 2/e – 2004.
2. Anil.K.Jain – Fundamentals of Digital Image Processing- Pearson Education-2003.

### **Course Outcomes**

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



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1.	understand the need for image transforms different types of image transforms and their properties.
2.	learn different techniques employed for the enhancement of images.
3.	learn different feature extraction techniques for image analysis and recognition

## SEMESTER- VIII

**COURSE CODE** :- **MJ-801P**

**COURSE TITLE** :- **LAB BASED ON DIGITAL IMAGE PROCESSING**

**CREDIT** :- **1**

1. Simulation and Display of an Image, Negative of an Image(Binary & Gray Scale)
2. Implementation of Relationships between Pixels
3. Implementation of Transformations of an Image
4. Contrast stretching of a low contrast image, Histogram, and Histogram Equalization
5. Display of bit planes of an Image
6. Display of FFT(1-D & 2-D) of an image
7. Computation of Mean, Standard Deviation, Correlation coefficient of the given Image
8. Implementation of Image Smoothing Filters(Mean and Median filtering of an Image)
9. Implementation of image sharpening filters and Edge Detection using Gradient Filters
10. Image Compression by DCT, DPCM, HUFFMAN coding
11. Implementation of image restoring techniques
12. Implementation of Image Intensity slicing technique for image enhancement
13. Canny edge detection Algorithm





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## SEMESTER- VIII

**COURSE CODE** : - **RC**  
**COURSE TITLE** : - **RESEARCH INTERNSHIP / FIELD WORK / DISSERTATION**  
**CREDIT** : - **12**

**RC-1** Research Methodology : 100 marks  
**RC-2** Research Proposal : 100 marks  
**RC-3** Research Report : 100 marks



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## SEMESTER- VIII

**COURSE CODE** : - **AMJ-801T**  
**COURSE TITLE** : - **CLOUD COMPUTING**  
**CREDIT** : - **3**  
**TOTAL LECTURES:-** **45**

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module 1:** Overview of Computing Paradigm, Recent trends in Computing: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing.

**Module 2:** Introduction to Cloud Computing: Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Benefits and limitations of Cloud Computing

**Module 3:** Cloud Computing Architecture: Comparison with traditional computing architecture (client/server), Services provided at various levels, Service Models- Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), How Cloud Computing Works, Deployment Models- Public cloud, Private cloud, Hybrid cloud, Community cloud.

**Module 4:** Case Studies: Case study of Service model using Google App Engine,

**Module 5:** Service Management in Cloud Computing. Service Level Agreements (SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling

**Module 6:** Cloud Security Infrastructure Security- Network level security, Host level security, Application-level security, Data security and Storage- Data privacy and security Issues, Jurisdictional issues raised by Data location, Authentication in cloud computing.



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## Course Outcomes: -

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

1	Understand the specifics of virtualization and cloud computing architectures.
2	Develop and deploy cloud application using services of different cloud computing technologies provider
3	Google app Engine, Evaluate the security and operational aspects in cloud system design,
4	Provide recommendations on cloud computing solutions for a Green enterprise

## Books Recommended :-

1. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010
2. Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wile, 2011
3. Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam, Springer, 2012

## SEMESTER- VIII

**COURSE CODE :- AMJ-801P**

**COURSE TITLE :- LAB ON CLOUD COMPUTING**

1. Create virtual machines that access different programs on same platform.
2. Create virtual machines that access different programs on different platforms .
3. Working on tools used in cloud computing online- a) Storage b) Sharing of data c) manageyour calendar, to-do lists, d) a document editing tool
4. Exploring Google cloud
5. Exploring microsoft cloud
6. Exploring amazon cloud



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## SEMESTER- VIII

**COURSE CODE** :- **AMJ-802T**  
**COURSE TITLE** :- **DESIGN AND ANALYSIS OF ALGORITHMS**  
**CREDIT** :- **3**  
**TOTAL LECTURES:-** **45**

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module: 1** Sorting, Selection: Insertion Sort, Linear Time Sorting - Count Sort, Radix Sort, Selection Problem. Analysis of time complexity of all algorithms.

**Module: 2** Graphs: Graph, representation of graphs, traversal of graphs, directed graphs, Directed Acyclic Graphs and Topological Ordering; all with analysis of time complexity.

**Module: 3** Divide and Conquer: Introduction to divide and conquer technique, Merge Sort, Quick Sort with analysis of time complexity.

**Module: 4** Greedy algorithms: Introduction to the Greedy algorithm design approach, application to minimum spanning trees, fractional knapsack problem, shortest path problem with analysis of time complexity.

**Module: 5** Dynamic Programming: Introduction to the Dynamic Programming approach, application to weighted interval scheduling, integer knapsack problem with analysis of time complexity.

**Module: 6** Hash Tables: Hash Functions, Collision resolution schemes.

### **Books Recommended**

1. Cormen, T.H., Leiserson, C.E., Rivest, R. L., Stein C. Introduction to Algorithms, 4<sup>th</sup> edition, Prentice Hall of India, 2022.
2. Kleinberg, J., Tardos, E., Algorithm Design. 1st edition. Pearson, 2013.

### **Course Outcomes: -**

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

1.	Analyze the asymptotic performance of algorithms.
2.	Write rigorous correctness proofs for algorithms.
3.	Demonstrate a familiarity with major algorithms and data structures.



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## SEMESTER- VIII

**COURSE CODE** : - **AMJ-802P**  
**COURSE TITLE** : - **LAB BASED ON ALGORITHMS**

**CREDIT** : - **1**

Suggested Practical List

1. Implement Insertion Sort, Selection sort, Bubble Sort (The program should report the number of comparisons).
2. Implement Merge Sort (The program should report the number of comparisons).
3. Implement Quick sort (The program should report the number of comparisons).
4. Implement Radix Sort.
5. Implement Count Sort.
6. Implement Searching Techniques: Linear and binary.
7. Implement BFS traversal on a graph.
8. Implement DFS traversal on a graph.
9. Implement 0-1 knapsack problem using DP



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## SEMESTER- VIII

**COURSE CODE** : - **AMJ-803T**  
**COURSE TITLE** : - **DATA SCIENCE**  
**CREDIT** : - **3**  
**TOTAL LECTURES:-** **45**

The questions must cover the entire syllabus with equal distribution of marks as far as practicable.

**Module-1 Introduction to Data Science:** Definition, Components, Need of Data Science, Works of Data Science, Advantages and Disadvantages of Data Science, Life Cycle of Data Science.

**Module-2:** Basic definitions and concepts, key elements, supervised and unsupervised learning, introduction to reinforcement learning, applications of Machine Learning.

**Module-3 Preprocessing:** Feature scaling, feature selection methods. dimensionality reduction (Principal Component Analysis).

**Module-4 Regression:** Linear regression with one variable, linear regression with multiple variables, gradient descent, over-fitting, regularization. Regression evaluation metrics.

**Module-5 Classification:** Decision trees, Naive Bayes classifier, logistic regression, k-nearest neighbor classifier, perceptron, multilayer perceptron, neural networks, back-propagation algorithm, Support Vector Machine (SVM). Classification evaluation metrics.

**Module-6 Clustering:** Approaches for clustering, distance metrics, K-means clustering, hierarchical clustering.

### **Course Outcomes: -**

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

1.	Develop relevant <b>programming</b> abilities.
2.	develop the ability to build and assess data-based <b>models</b> .
3.	apply data science concepts and methods to <b>solve</b> problems in real-world contexts and will <b>communicate</b> these solutions effectively



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## Books Recommended

1. Mitchell, T.M. *Machine Learning*, McGraw Hill Education, 2017.
2. James, G., Witten. D., Hastie. T., Tibshirani., R. *An Introduction to Statistical Learning with Applications in R*, Springer, 2014.
3. Alpaydin, E. *Introduction to Machine Learning*, MIT press, 2009

## SEMESTER- VIII

**COURSE CODE : - AMJ-803P**

**COURSE TITLE : - LAB ON MACHINE LEARNING**

Use Python for practical labs for Machine Learning. Utilize publically available datasets from online repositories like <https://data.gov.in/> and <https://archive.ics.uci.edu/ml/datasets.php> For evaluation of the regression/classification models, perform experiments as follows:

- Scale/Normalize the data
- Reduce dimension of the data with different feature selection techniques
- Split datasets into training and test sets and evaluate the decision models
- Perform k-cross-validation on datasets for evaluation Report the efficacy of the machine learning models as follows:
  - MSE and  $R^2$  score for regression models
  - Accuracy, TP, TN, FP, FN, error, Recall, Specificity, F1-score, AUC for classification models

For relevant datasets make prediction models for the following

1. Naïve Bayes Classifier
2. Simple Linear Regression multiple linear regression
3. Polynomial Regression
4. Lasso and Ridge Regression
5. Logistic regression
6. Artificial Neural Network
7.  $k$ -NN classifier
8. Decision tree classification
9. SVM classification
10. K-Means Clustering
11. Hierarchical Clustering



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## SEMESTER-I

**COURSE CODE** :- SEC-101T  
**COURSE TITLE** :- Computer Fundamental and Office Automation  
**CREDIT** :- 2

**Module1.** Computer system: characteristics and capabilities. Computer Hardware and Software: Block Diagram of a Computer, Different Data Processing, Types of Computers Generation of Compute. Number System, Binary nos., Signed/Unsigned nos., 2's complement no's, Boolean algebra, De Morgan's Theorem, Simplification of Boolean Expressions, Karnaugh Map. Logic Gates, Truth Tables Combinational Logic Circuits & Realizations with Logic Gates- Half & Full Adders, Multiplexers, Demultiplexers, Encoders, Decoders. Sequential Circuits- Flip Flop (JK,RS,T,D), Counters(Synchronous and Asynchronous).

**Module-2 MS-Word:** Introduction, Starting MS-Word, Microsoft word Environment working with word documents, working with text, working with tables checking spelling and grammar, adding graphs to the document, mail merge, header and footers, page numbers, protect the document, working with formatting tools.

**Module-3 MS-Excel:** Introduction, starting MS Excel, Microsoft Excel environment, Working with Excel workbook, Working with worksheet – Entering data, Excel formatting tips and Techniques, Generating graphs, Formulas and Functions, Inserting charts, Sorting, Pivot Tables, data extraction, adding clip art, add an image from a file, Printing in Excel .

**Module-4 MS-Power point-** Starting MS–Power Point, working with power point -, Creating, Saving and Printing a presentation, Working with Animation, Adding a slide to presentation, Navigating through a presentation, Slide-sorter, Slide-show, Editing slides, Working with Graphics and Multimedia in PowerPoint (Inserting Photo, Video & Sound).

**Module-5 The Internet:** Basic internet terms, Internet applications, Internet tools, Web browser, Web browser features, Internet Explorer environment, Electronic mail, Email address structure, Advantages and disadvantages of email.

### Books Recommended:

1. Computer system Architecture – M. M. Mano
2. Digital electronics – B. Ram
3. ITL Education Solution Limited, Introduction to Information Technology, Second Edition., Pearson Peter Norton, Introduction to Computers, 7th edition, Tata McGraw Hill Publication, 2011
4. Anita Goel, Computer Fundamentals, Pearson Education, 2011
5. Linda Foulkes, Learn Microsoft Office 2019: A comprehensive guide to getting started with Word,





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## Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

1.	Compare and contrast various types of operating systems
2.	Explain the purpose of office automation
3.	Describe how information is stored and retrieved in/from computer memory
4.	Create document using word processing software
5.	Design presentation using presentation software
6.	Create worksheets using spreadsheet software
7.	Store and retrieve data in/from database management application

## SEMESTER-I

**COURSE CODE** : - **SEC-101P**  
**COURSE TITLE** : - **Lab Based on Ms-office**  
**CREDIT** : - **1**

**Practical on Ms-office(word,excel,powerpoint)**



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## SEMESTER-II

**COURSE CODE** : - SEC-201T  
**COURSE TITLE** : - Soft Skills  
**CREDIT** : - 2

**Module-1- SELF ANALYSIS SWOT** Analysis, who am I, Attributes, Importance of Self Confidence, Self Esteem **CREATIVITY** Out of box thinking, Lateral Thinking.

**Module-2- ATTITUDE** Factors influencing Attitude, Challenges and lessons from Attitude, Etiquette. **MOTIVATION** Factors of motivation, Self talk, Intrinsic & Extrinsic Motivators.

**Module-3- GOAL SETTING** Wish List, SMART Goals, Blue print for success, Short Term, Long Term, Life Time Goals. Time Management Value of time, Diagnosing Time Management, Weekly Planner to do list, Prioritizing work. Extempore **ASSESSMENT**

**Module-4- INTERPERSONAL SKILLS** Gratitude Understanding the relationship between Leadership Networking & Team work. Assessing Interpersonal Skills Situation description of Interpersonal Skill. Team Work: Necessity of Team Work Personally, Socially and Educationally.

**Module-5 - LEADERSHIP** Skills for a good Leader, Assessment of Leadership Skills,

**Module-6 - STRESS MANAGEMENT** Causes of Stress and its impact, how to manage & distress, Circle of control, Stress Busters. Emotional Intelligence what is Emotional Intelligence, emotional quotient why Emotional Intelligence matters, Emotion Scales. Managing Emotions.

### Book Recommended:

SOFT SKILLS, 2015, Career Development Centre, Green Pearl Publications.

### Course Outcomes: -

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

1.	Develop effective communication skills
2.	Develop effective presentation skills.

## SEMESTER-II

**COURSE CODE** : - SEC-202P  
**COURSE TITLE** : - Lab Based on Soft Skills  
**CREDIT** : - 1  
Personality development



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## SEMESTER-III

**COURSE CODE** : - SEC-301T  
**COURSE TITLE** : - Organizational Behaviour  
**CREDIT** : - 2

**Module-1 Introduction:** Meaning and importance of the study of OB **Behaviour and its causation:** Introduction to personality, perception, learning and attitude

**Module-2 Motivation:** Importance of psychological process of motivation, salient motivation tools Need Theories/ Content Theories (Maslow's Hierarchy of Needs, Alderfer's ERG Theory Process Theories (Herzberg's Two Factor Theory and Vroom's Expectancy Theory)

**Module-3 Leadership and Group Dynamics:** Historically Important (Ohio State and Michigan leadership Theories), Traditional Theories (Trait Theory and Contingency Theory) Modern Theories (Charismatic Theories), Formal and informal groups, role concept

**Module-4 Improving Interpersonal Effectiveness:** Interpersonal communication, Introduction to TA

**Module-5 Conflict Management and Team Building:** Sources of Conflict, Types of Conflict, Negotiation (process and issues).

**Module-6 Concepts of Organizational Culture and Organizational Development:** Definition, Organizational Culture **Organizational Development:** Concept of OD, Phases of OD and OD Interventions, Limitations of OD Interventions Concept of Morale and Job Satisfaction.

### **Books Recommended:**

1. Pareek, U. Understanding Organizational Behaviour (Oxford University Press: New Delhi)
2. Robbins, S.P. & Sanghi Organizational Behaviour (Prentice Hall India: New Delhi)

### **Course Outcomes: -**

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

1.	To develop creative and innovative ideas that could positively shape the organizations
2.	To accept and embrace in working with different people from different cultural and diverse background in the workplace.

## SEMESTER-III

**COURSE CODE** : - SEC-302P  
**COURSE TITLE** : - Lab Based on Organizational Behaviour  
**CREDIT** : - 1

Organizational Behavior, Leadership & Group Discussion and Organizational Development



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## FORMAT OF QUESTION PAPER FOR END SEMESTER UNIVERSITY EXAMINATION

Question format for **50 Marks**

F.M.=50  
Subject/ Code  
Time=3 Hrs.  
Exam Year

General Instructions:

- Group A** carries very short answer type compulsory questions.
- Answer 3 out of 5** subjective/descriptive questions given in **Group B**.
- Answer in your own words as far as practicable.
- Answer all sub parts of a question at one place.
- Numbers in right indicate full marks of the question.

### Group-A

1. [5x1=5]
- .....
  - .....
  - .....
  - .....
  - .....

### Group-B

2. [15]  
3. [15]  
4. [15]  
5. [15]  
6. [15]

Note: There may be subdivisions in each question asked in Theory Examination

Question format for **60 Marks**

F.M.=60  
Subject/ Code  
Time=3 Hrs.  
Exam Year

General Instructions:

- Group A** carries very short answer type compulsory questions.
- Answer 3 out of 5** subjective/descriptive questions given in **Group B**.
- Answer in your own words as far as practicable.
- Answer all sub parts of a question at one place.
- Numbers in right indicate full marks of the question.

### Group-A

1. [5x1=5]
- .....
  - .....
  - .....
  - .....
  - .....



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2. .... [5]  
3. .... [5]

## Group-B

4. .... [15]  
5. .... [15]  
6. .... [15]  
7. .... [15]  
8. .... [15]

Note: There may be subdivisions in each question asked in Theory Examination

Question format for **75 Marks**

F.M.=75

Subject/ Code

Time=3 Hrs.

Exam Year

General Instructions:

- vi. **Group A** carries very short answer type compulsory questions.  
vii. **Answer 4 out of 6** subjective/descriptive questions given in **Group B**.  
viii. Answer in your own words as far as practicable.  
ix. Answer all sub parts of a question at one place.  
x. Numbers in right indicate full marks of the question.

## Group-A

7. .... [5x1=5]  
vi. ....  
vii. ....  
viii. ....  
ix. ....  
x. ....

8. .... [5]  
9. .... [5]

## Group-B

10. .... [15]  
11. .... [15]  
12. .... [15]  
13. .... [15]  
14. .... [15]  
15. .... [15]

Note: There may be subdivisions in each question asked in Theory Examination



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Question format for **100 Marks**

**Subject/ Code**

F.M.=100

Time=3 Hrs.

Exam Year

General Instructions:

- vi. **Group A** carries very short answer type compulsory questions.
- vii. **Answer 4 out of 6** subjective/descriptive questions given in **Group B**.
- viii. Answer in your own words as far as practicable.
- ix. Answer all sub parts of a question at one place.
- x. Numbers in right indicate full marks of the question.

## Group-A

9.

[10x1=10]

vi. ....

vi. ....

vii. ....

vii. ....

viii. ....

viii. ....

ix. ....

ix. ....

x. ....

x. ....

10. ....

[5]

11. ....

[5]

## Group-B

12. ....

[20]

13. ....

[20]

14. ....

[20]

15. ....

[20]

16. ....

[20]

17. ....

[20]

Note: There may be subdivisions in each question asked in Theory Examination



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## FORMAT OF QUESTION PAPER FOR SEMESTER INTERNAL EXAMINATION

### Question format for 10 Marks

Subject/ Code

F.M.=10

Time=1 Hr.

Exam Year

General Instructions:

- xi. **Group A** carries very short answer type compulsory questions.
- xii. **Answer 1 out of 2** subjective/descriptive questions given in **Group B**.
- xiii. Answer in your own words as far as practicable.
- xiv. Answer all sub parts of a question at one place.
- xv. Numbers in right indicate full marks of the question.

#### Group-A

16.

[5x1=5]

- xi. ....
- xii. ....
- xiii. ....
- xiv. ....
- xv. ....

#### Group-B

17. ....

[5]

18. ....

[5]

Note: There may be subdivisions in each question asked in Theory Examination

### Question format for 20 Marks

Subject/ Code

F.M.=20

Time=1 Hr.

Exam Year

General Instructions:

- xi. **Group A** carries very short answer type compulsory questions.
- xii. **Answer 1 out of 2** subjective/descriptive questions given in **Group B**.
- xiii. Answer in your own words as far as practicable.
- xiv. Answer all sub parts of a question at one place.
- xv. Numbers in right indicate full marks of the question.

#### Group-A

18.

[5x1=5]

- xi. ....
- xii. ....
- xiii. ....



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- xiv. ....
- xv. ....
19. .... [5]

### Group-B

20. .... [5]
21. .... [5]

Note: There may be subdivisions in each question asked in Theory Examination