



आईएफटीएम विश्वविद्यालय, मुरादाबाद, उत्तर प्रदेश
IFTM University, Moradabad, Uttar Pradesh
NAAC ACCREDITED

Course Structure

&

Syllabus

of

Diploma

Computer Science & Engineering

[Applicable w.e.f. Academic Session - 2022-23]
[As per CBCS guidelines given by UGC]

UNIVERSITY POLYTECHNIC
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
IFTM UNIVERSITY, MORADABAD



आईएफटीएम विश्वविद्यालय, मुरादाबाद, उत्तर प्रदेश
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**Study & Evaluation Scheme of
Diploma (Computer Science & Engineering)
[Session 2022-23]
(As per CBCS guidelines)**

Programme	Diploma (Computer Science & Engineering)
Course Level	Diploma
Duration	Three Years (Six Semesters) Full Time
Medium of instruction	English/Hindi
Minimum Required Attendance	75%
Maximum Credits	160

<i>Evaluation Scheme:</i>			
	<i>Internal</i>	<i>External</i>	<i>Total</i>
<i>Theory</i>	<i>30</i>	<i>70</i>	<i>100</i>
<i>Practical</i>	<i>30</i>	<i>70</i>	<i>100</i>
<i>Seminar/Industrial Training</i>	<i>100</i>	<i>--</i>	<i>100</i>
<i>Project Reports</i>	<i>60</i>	<i>140</i>	<i>200</i>

Evaluation of Performance

1. **Programmes:** Evaluation of performance of the students in a programme shall be a continuous process based on their performance in the class test, quizzes, assignments and the end semester examinations.

a. Theory papers in semester system (Maximum Marks: 100)

The evaluation will be done through two class test and one end semester examination. This will be in addition to quizzes, assignments, attendance, etc. Each class test will carry a weightage of 10 marks, and the end semester examination will carry a weightage of 70 marks. The remaining 10 marks will be awarded on the basis of attendance and performance in quizzes and assignments.

b. Practical in semester system (Maximum Marks: 100)

In each practical, the student will be required to carry out the number of experiments as specified in the syllabus. Each practical conducted will be assessed by the teacher based on the experiment done during the lab, submission of the practical file, and understanding of the experiment done, which will carry a

weightage of 30 marks. There shall be an end semester practical examination with or without an external examiner which will carry a weightage of 70 marks.

2. **Summer Training, Project, Seminar etc.:** Summer Training, Project, Seminar, and other learning-oriented activities shall have associated maximum marks and credits, as stated in the syllabus.

3. Examination:

- a. The minimum Grade required to pass in each Theory & Practical paper is 'GRADE D'.
- b. A candidate, in order to pass, minimum CGPA of 4.50 is required in a particular academic year inclusive of both semesters of that academic. And maximum number of Carryover paper permissible for promotion to next academic year are 06 theory / practical / project papers.
- c. There shall be no minimum Grade required to pass in General Proficiency (GP). However, Grade obtained in General Proficiency (GP) shall be included in SGPA.
- d. In case of audit paper, the minimum Grade required to pass is Grade D. However, the Grade obtained in audit paper shall not be included in SGPA.

For further information, examination ordinance of IFTM University can be followed.

A. Objective of the program:

Diploma in Engineering plays a major role of all innovations. It is a program that focused on practical and skills-oriented training. It is a technical course and covers the basics and essentials used with an undergraduate engineering degree. It aims to provide students with technical job-related engineering knowledge, scientific skills, mathematical techniques, a good knowledge of English to communicate in the field and ability to apply problem-solving techniques.

There is always a good scope of Diploma in Engineering program as it provides numerous job opportunities from different companies. With the help of this program, there is also a secure and constant growth of career for students. Nowadays, no technical advancement is possible without the help of core branches of Diploma in Engineering i.e., Civil, Computer, Electrical, Electronics, and Mechanical. Syllabus for Diploma in engineering makes the students to work in variety of Engineering sectors. With the help of basic sciences, a student of Diploma in Engineering can develop understanding of scientific principles and analytical ability.

Basic sciences courses make a smooth path for the technical courses of Diploma in Engineering. English language course is also incorporated to enhance the communication skills for better job opportunities.

Diploma in Engineering program consists of six semesters that includes teaching of core courses, program electives, seminar/industrial training/project work, value added and open elective courses. The University continuously works with students for making a strong desire and capacity for learning.

After finishing Diploma in Engineering program, students have numerous opportunities in various renowned industries, while some students open their own start-ups. Some students have gone through for B. Tech. to pursue higher studies in the chosen specializations.

Diploma in Engineering holders will have several opportunities in industries like Telecommunication, Automobile and Electronics equipment manufacturing, production, construction in real states etc.

Diploma Mechanical engineers are generally working in manufacturing industries, defense, PWD and Telegraphs etc. Electronic and Communication engineers and Electrical engineers have several opportunities in industries such as electronics, IT, manufacturing, power, transport, construction, telecommunications, research and development, and petrochemicals. Civil engineers are having opportunities in construction of new set up and building in real state.

B. Choice Based Credit System (CBCS)

Choice based credit system (CBCS), provides a learning platform wherein the student or knowledge seeker has the flexibility to choose their course from a list of elective, core and soft skill courses. This is a student-centric approach to achieve his target number of credits as specified by the UGC and adopted by our university.

The following is the course module designed for the Diploma Program:

Core Course (CC): Core courses of Diploma program will provide a foundation approach to Diploma in Engineering, giving students an overview of the field, a basis to build and specialize upon. These core courses are the strong foundation to establish engineering knowledge and provide broad multi-disciplined knowledge can be studied further in depth during the elective phase. The Core courses will provide more practical-based knowledge, case-based lessons and collaborative learning models. It will train the students to analyze, decide, and lead-rather than merely know-while creating a common student experience that can foster deep understanding, develop decision-making ability and contribute to the engineering and community at large. A wide range of Core courses with four credits hours each provides groundwork in the engineering disciplines: Elementary Physics, Elementary Chemistry, Elementary Mathematics, Elementary Engineering Mechanics, Elementary Mechanical Engineering, Workshop Technology, Computer fundamentals & Programming in C, Basic Electrical & Electronics Engineering, Engineering Drawing Lab, Physics Lab, Chemistry Lab, Workshop Lab, Basic Electrical & Electronics

Engineering Lab. The integrated foundation is Diploma in Computer Science & Engineering Syllabus as per CBCS (2019-20). Diploma is important for students because it will not only allow them to build upon existing skills, but they can also explore career options in a range of industries, and expand their understanding of various business fields. We offer 11 Core courses with 4 credits, 08 Core Course with 01 credit for each during the Diploma Program.

Ability Enhancement Compulsory Course (AECC): As per the guidelines of Choice Based Credit System (CBCS) for all Universities, including the private Universities, the Ability Enhancement Compulsory Course (AECC) is a course designed to develop the ability of students in communication (especially English) and other related courses where they might find it difficult to communicate at a higher level in their prospective job at a later stage due to lack of practice and exposure in the language, etc. Students are motivated to learn the theories, fundamentals and tools of communication which can help them develop and sustain in the corporate environment and culture. We offer 02 AECC with credit 4 in first semester, while in fourth semester student have to pass the course having no credit during the Diploma Program.

Skill Enhancement Course (SEC): General Proficiency, Industrial Training, Seminar, Project are skill enhancement courses in all Semester of Diploma in Engineering Program. These courses are designed so that students gain the industrial knowledge and improve his/her practical skills.

Discipline Specific Course (DSC): These are discipline Specific course that do not have any choice and will be of 4 credits each for theory and 2 credits each for theory subjects related labs. Each student of Diploma in engineering program has to compulsorily pass the discipline Specific course. A wide range of Discipline Specific courses with four credits hours each provides groundwork in the engineering disciplines: Basic Digital Electronics, Introduction to Data Structure and Algorithm, Basic Object-Oriented Concepts & C++, Computer Application Software Packages, Organizational Behavior, Introduction to Computer Network, Introduction to Database Management System, Introduction to Operating System, Java Programming, Basics of Computer Organization, System Administration, Computer Graphics & Multimedia, Introduction to Software Engineering Principles, .Net Programming, Web Designing, Computer Hardware Maintenance & some of lab courses related to above specific courses etc. The integrated foundation is important for students because it will not only allow them to build upon existing skills, but they can also explore career options in a range of industries, and expand their understanding of various business fields.

Discipline Specific Elective Course (DSE): The discipline specific elective course is chosen to make students specialist or having specialized knowledge of a specific domain like Introduction to Management Information System, E- Commerce, Python Programming, Cloud Computing. It will be covered in two semesters (V & VI) of Third year of the program relevant to chosen

disciplines of compulsory/core courses of the program. The student will have to choose any two electives out of the four DSE offered. Each student will have to choose two discipline specific elective courses (DSECs) in all chosen; 1 in Semester V and 1 in Semester VI respectively. Each DSEC will carry 4 credits.

Open Elective courses (DOE): Open electives are additional courses that students may take to meet course requirements beyond their Core Requirements. Open Elective is a powerful tool introduced in the final year of Diploma Engineering syllabus. With the concept of Open Elective, a student can study new subjects from other streams or subjects from the same stream but which were not initially available into the main stream curriculum.

There are 5 open elective courses Industrial Management & Entrepreneurship Development, Disaster Management, Total Quality management & Non-Conventional Energy Resources and NCC General. Students have to choose 01 course in semester 5th out of 02 courses (Industrial Management& Entrepreneurship Development, Disaster Management) and 01 course in semester 6th out of 03 courses (Total Quality management, Non-Conventional Energy Resources and NCC General).

C. Program Outcomes (POs) (What s/he will be able to do at the entry point of industry soon after the diploma programme)

PO1: Basic knowledge: An ability to apply knowledge of basic mathematics, science and engineering to solve the engineering problems.

PO2: Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

PO3: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give/receive clear instructions

PO4: The engineer and society: apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice

PO5: Ethics: Identify and demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work

PO6: Environment and sustainability: Understand the impact of the engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

PO7: Individual and team work: Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

PO8: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

D. Program Specific Outcomes (PSO) of Computer Science & Engineering Program:

Students completing this programme will be able to:

PS01: An ability to apply knowledge of computing and mathematics appropriate to the discipline.

PS02: Analyze a computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

PS03: An ability to lay strong foundation of innovative learning and creative ideas.

PS04: Apply computer science theory and software development fundamentals to produce computing-based solutions.

PS05: An ability to function on multi-disciplinary teams.

PS06: An understanding of professional and ethical responsibilities for the computing profession.

PS07: An ability to analyze impacts of computing on individuals, organizations, and society.

PS08: An ability to use appropriate techniques, skills, and tools necessary for computing practice.

PS09: An ability to apply design and development principles in the building of software systems.

PS10: An ability to communicate effectively.

E. Pedagogy & Unique practices adopted:

Our teachers' use of communicative strategies encourages pedagogic practices that are interactive in nature and is more likely to impact on student learning outcomes. Some specific strategies, that promoted this interactive pedagogy includes:

Audio-Visual Based Learning:

It is clear that audio visual aids are important tools for teaching learning process. It helps the teacher to present the lesson effectively and students learn and retain the concepts better and for longer duration. Use of audio-visual aids improves student's critical and analytical thinking. It helps to remove abstract concepts through visual presentation. However, improper and

unplanned use of these aids can have negative effect on the learning outcome. Therefore, teachers should be well trained through in-service training to maximize the benefits of using these aids. The curriculum should be designed such that there are options to activity-based learning through audio-visual aids. In addition, government should fund resources to purchase audio-visual aids in colleges

Field / Live Projects:

The objective of their training program is to enhance knowledge of the students on any one of the Trending technologies according to the industry standards without which the student degree is a mere degree. This is done by making students work on live projects which equip them with the required skill needed for the corporate world.

Personality Development Program (PDP)

It is conducted by professional trainers/experts from corporates as also by dedicated in-house faculty to actually bring a change in the traits of students in terms of values, behavior and personal growth. It enhances their body language, self-discipline, includes boosting one's confidence, improving language speaking abilities and widening one's scope of knowledge. Following PDP programs are undertaken in the Institute.

- **Aptitude:** Prepare students for placements by enhancing students' understanding in reasoning, numeric aptitudes, language proficiencies and general awareness.
- **Resume Writing:** Trains students about the current trend to present their Personal, Educational & Professional achievements and Strengths in an impressive manner. They learn how to write covering letter through which they can efficiently present their extra information. They also get an exposure to the Social Professional Sites like LinkedIn.
- **Group Discussion:** Help students to improve their ability to understand a topic/idea from different perspectives. They are able to realize its importance as a standard recruitment and selection tool. Students are trained to demonstrate their leadership, team work, oral and body language skills.
- **Personal Interview:** A platform to train students in improving their listening abilities and handling interviewer's questions and answer accordingly so that they are able to remove hesitation and anxiety during placement process.

Student Development Programs (SDP)

SDP has various modules dealing with professional development, Awareness and opinion building, communication and self-presentation etc. The purpose of these modules is to help

students grow as individuals, develop the power of critical thinking and, at a material level, secure better placements.

Special Guest Lectures (SGL)

Guest lectures are a highly useful medium to provide exceptional knowledge to students, it also adds an extra variety to the classroom routine and universities put a lot of emphasis on the importance of Guest lectures. The Guest lecturers are the “real-world” arriving in the classroom in order to make classes more interesting.

Industrial Visits

Industrial visits are an integral part of Engineering and acknowledgment of technological up gradation. Industrial visit is considered as one of the tactical methods of teaching. The main reason behind this, it lets student to know things practically through interaction, working methods and employment practices. Moreover, it gives exposure from academic point of view. Main aim of industrial visit is to provide an exposure to students about practical working environment. They also provide students a good opportunity to gain full awareness about industrial practices. Through industrial visit students get awareness about new technologies. Technology development is a main factor, about which a students should have a good knowledge. Visiting different companies actually help students to build a good relationship with those companies.

Industry Focused programs:

Industry oriented education is an approach to learning from an industry perspective where core subjects are taught in the context of application of that knowledge to product design, development and operation.

Mentoring scheme:

The new process has been established as Mentoring System. Each faculty will be the mentor of a group of 20 to 25 students. First, second, and third-year students will have mentors from the parent department. Departmental faculties will continue to be mentors for the same group of students till their graduation.

HOD: The HOD will,

1. Meet all mentor of his/her department at least once a month to review proper implementation of the system

2. Advice mentors wherever necessary.
3. Initiate administrative action on a student when necessary.
4. Keep the head of the institute informed.

Extracurricular Activities:

In IFTM University, various Co-Curricular and Extra-Curricular activities are regularly conducted along with regular Academic activities and students are continuously inspired and motivated to participate in these various activities to ensure the overall development of the students.

- **Cultural Activities:** The various activities undertaken are – Singing, Dancing, Playing Musical Instruments, Compering, Skit, Band, Stand-up Comedy, Poetry, Fashion Show etc. These activities help to develop self-confidence, cultural interest, creativity and sense of cooperation among students.
- **Games & Sports:** IFTM strongly believes that a healthy physique leads to a healthy mind. The Institute encourages sports culture and students also reciprocate by actively participating and distinguishing themselves at Sports Meets. IFTM possesses proper playgrounds and hard courts for outdoor sports. In Boys hostels students enjoy the facilities of Gym, badminton, and Table Tennis. The various sports activities undertaken are – cricket, football, basketball, volley ball, carom, chess, badminton, athletics etc. They increase self-esteem & mental alertness among students and promote team spirit. They also lead to balanced mental and physical growth of the students and teach them life skills like discipline, teamwork, leadership, patience, perseverance etc.

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Diploma (Computer Science & Engineering)
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Cluster of Courses for Diploma (Computer Science & Engineering) Programme

1. Elementary/Fundamental Science Core Courses (CC)

S. No	Course Code	Subject Name	Credit
1	DPPH-101	Elementary Physics-I	04
2	DPMA-101	Elementary Mathematics -I	04
3	DPCH-101	Elementary Chemistry-I	04
4	DPPH-151	Physics-I Lab	01
5	DPCH-151	Chemistry-I Lab	01
6	DPPH-201	Elementary Physics-II	04
7	DPMA-201	Elementary Mathematics -II	04
8	DPCH-201	Elementary Chemistry-II	04
9	DPPH-251	Physics-II Lab	01
10	DPCH-251	Chemistry – II Lab	01

2. Engineering Science Core Courses (CC)

S. No	Subject Code	Subject Name	Credit
1	DPME-101 / DPME-201	Elementary Engineering Mechanics	04
2	DPCS-101 / DPCS-201	Computer Fundamentals & Programming in C	04
3	DPME-102 / DPME-202	Workshop Technology	04
4	DPEE-101 / DPEE-201	Basic Electrical & Electronics Engineering	04
5	DPME-151 / DPME-251	Engineering Drawing Lab	01
6	DPCS-151 / DPCS-251	Computer Programming Lab	01
7	DPME-152 / DPME-252	Workshop Lab	01
8	DPEE-151 / DPEE-251	Basic Electrical and Electronics Engineering Lab	01
9	DPME-203	Elementary Mechanical Engineering	04

3. Engineering Discipline Specific Core Courses (DSC)

S. No	Subject Code	Subject Name	Credit
1	DPCS-301	Basic Digital Electronics	04
2	DPCS-302	Introduction to Data Structure and Algorithm	04
3	DPCS-303	Basic Object-Oriented Concepts & C++	04
4	DPCS-304	Computer Application Software Packages	04
5	DPCS-305	Organizational Behavior	04
6	DPCS-351	Digital Electronics Lab	01
7	DPCS-352	Data Structure Lab	01
8	DPCS-353	C++ Lab	01
9	DPCS-354	Computer Application Software Packages Lab	01
10	DPCS-401	Introduction to Computer Network	04
11	DPCS-402	Introduction to Database Management System	04

12	DPCS-403	Introduction to Operating System	04
13	DPCS-404	Java Programming	04
14	DPCS-405	Basics of Computer Organization	04
15	DPCS-451	Computer Network Lab	01
16	DPCS-452	DBMS Lab	01
17	DPCS-453	Operating System Lab	01
18	DPCS-454	Java Programming Lab	01
19	DPCS-501	System Administration	04
20	DPCS-502	Computer Graphics & Multimedia	04
21	DPCS-503	Introduction to Software Engineering Principles	04
22	DPCS-551	System Administration Lab	01
23	DPCS-552	Computer Graphics Lab	01
24	DPCS-601	.Net Programming	04
25	DPCS-602	Web Designing	04
26	DPCS-603	Computer Hardware Maintenance	04
27	DPCS-651	.Net Programming Lab	01
28	DPCS-652	Web Designing Lab	01

4. Discipline Elective Core Courses (DSC)

S. No	Subject Code	Subject Name	Credit
1	DPCS-504	Introduction to Management Information System	04
2	DPCS-505	E- Commerce	04
3	DPCS-604	Python Programming	04
4	DPCS-605	Cloud Computing	04

5. Open Elective Course (DOE)

S. No	Subject Code	Subject Name	Credit
1	DOEC-051	Industrial Management & Entrepreneurship Development	04
2	DOCE-051	Disaster Management	04
3	NCC-01	NCC General	04
4	DOME-061	Total Quality Management	04
5	DOEE-061	Non-Conventional Energy Resources	04

6. Ability Enhancement Compulsory Course (AECC)

S. No	Subject Code	Subject Name	Credit
1	FEC-101	Fundamentals of English Communication	04
2	PSC-401	Professional Communication	00

7. Project/ Seminar/Summer or Industrial Training (SEC)

S. No	Subject Code	Subject Name	Credit
1	DPCS-553	Industrial Training	01
2	DPCS-554	Seminar	01
3	DPCS-653	Project	04
4	DPGP-101	General Proficiency	01
5	DPGP-201	General Proficiency	01
6	DPGP -301	General Proficiency	01
7	DPGP -401	General Proficiency	01
8	DPGP -501	General Proficiency	01
9	DPGP -601	General Proficiency	01

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STUDY AND EVALUATION SCHEME
YEAR I, SEMESTER-I

S. No.	Section	Course Code	Course Name	Periods			Evaluation Scheme			Course Total	Credit	
				L	T	P	Mid Term Exam		External Exam			
							CT	AS +AT				Total
THEORY												
1.	CC-01	DPPH-101	Elementary Physics-I	3	1	0	20	10	30	70	100	4
2.	CC-02	DPMA-101	Elementary Mathematics -I	3	1	0	20	10	30	70	100	4
3.	CC-03	DPCH-101	Elementary Chemistry-I	3	1	0	20	10	30	70	100	4
4.	CC-04	DPME-101/ DPCS-101	Elementary Engineering Mechanics / Computer fundamentals & Programming in C	3	1	0	20	10	30	70	100	4
5.	CC-05	DPME-102/ DPEE-101	Workshop Technology / Basic Electrical & Electronics Engineering	3	1	0	20	10	30	70	100	4
6.	AECC-01	FEC-101	Fundamentals of English Communication	3	1	0	20	10	30	70	100	4
PRACTICALS/ PROJECT												
7.	CC-06	DPME-151/ DPCS-151	Engineering Drawing Lab / Computer Programming Lab	0	0	2	-	-	30	70	100	1
8.	CC-07	DPPH-151	Physics-I Lab	0	0	2	-	-	30	70	100	1
9.	CC-08	DPCH-151	Chemistry-I Lab	0	0	2	-	-	30	70	100	1
10.	CC-09	DPME-152/ DPEE-151	Workshop Lab / Basic Electrical and Electronics Engineering Lab	0	0	2	-	-	30	70	100	1
11.	SEC-01	DPGP-101	General Proficiency	-	-	-	-	-	100	-	100	1
TOTAL				18	06	08	-	-	-	-	1100	29

Abbreviation: CC- Core Course, AECC - Ability Enhancement Compulsory Course, SEC - Skill Enhancement Course

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STUDY AND EVALUATION SCHEME
YEAR I, SEMESTER-II

S. No.	Section	Course Code	Course Name	Periods			Evaluation Scheme			Course Total	Credit	
				L	T	P	Mid Term Exam		External Exam			
							CT	AS +AT				Total
THEORY												
1.	CC-10	DPPH-201	Elementary Physics-II	3	1	0	20	10	30	70	100	4
2.	CC-11	DPMA-201	Elementary Mathematics -II	3	1	0	20	10	30	70	100	4
3.	CC-12	DPCH-201	Elementary Chemistry-II	3	1	0	20	10	30	70	100	4
4.	CC-13	DPME-203	Elementary Mechanical Engg.	3	1	0	20	10	30	70	100	4
5.	CC-14	DPEE-201 / DPME-202	Basic Electrical & Electronics Engineering / Workshop Technology	3	1	0	20	10	30	70	100	4
6.	CC-15	DPME-201/ DPCS-201	Elementary Engineering Mechanics / Computer fundamentals & Programming in C	3	1	0	20	10	30	70	100	4
PRACTICALS/ PROJECT												
7.	CC-16	DPPH-251	Physics-II Lab	0	0	2	-	-	30	70	100	1
8.	CC-17	DPEE-251 / DPME-252	Basic Electrical and Electronics Engineering Lab / Workshop Lab	0	0	2	-	-	30	70	100	1
9.	CC-18	DPCS -251/ DPME-251	Computer Programming Lab / Engineering Drawing Lab	0	0	2	-	-	30	70	100	1
10.	CC-19	DPCH-251	Chemistry – II Lab	0	0	2	-	-	30	70	100	1
11.	SEC-02	DPGP-201	General Proficiency	-	-	-	-	-	100	-	100	1
TOTAL				18	06	08	-	-	-	-	1100	29

Abbreviation: CC- Core Course, SEC - Skill Enhancement Course

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YEAR II, SEMESTER-III

S. No.	Section	Course Code	Course Name	Periods			Evaluation Scheme			Course Total	Credit	
				L	T	P	Mid Term Exam		External Exam			
							CT	AS +AT				Total
THEORY												
1.	DSC-01	DPCS-301	Basic Digital Electronics	3	1	0	20	10	30	70	100	4
2.	DSC-02	DPCS-302	Introduction to Data Structure and Algorithm	3	1	0	20	10	30	70	100	4
3.	DSC-03	DPCS-303	Basic Object-Oriented Concepts & C++	3	1	0	20	10	30	70	100	4
4.	DSC-04	DPCS-304	Computer Application Software Packages	3	1	0	20	10	30	70	100	4
5.	DSC-05	DPCS-305	Organizational Behavior	3	1	0	20	10	30	70	100	4
PRACTICALS/ PROJECT												
6.	DSC-06	DPCS-351	Digital Electronics Lab	0	0	2	-	-	30	70	100	1
7.	DSC-07	DPCS-352	Data Structure Lab	0	0	2	-	-	30	70	100	1
8.	DSC-08	DPCS-353	C++ Lab	0	0	2	-	-	30	70	100	1
9.	DSC-09	DPCS-354	Computer Application Software Packages Lab	0	0	2	-	-	30	70	100	1
10.	SEC-03	DPGP -301	General Proficiency	-	-	-	-	-	100	-	100	1
TOTAL				15	05	08	-	-	-	-	1000	25

Abbreviation: DSC- Discipline Specific Course, SEC - Skill Enhancement Course

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STUDY AND EVALUATION SCHEME
YEAR II, SEMESTER-IV

S. No.	Section	Course Code	Course Name	Periods			Evaluation Scheme			Course Total	Credit	
				L	T	P	Mid Term Exam		External Exam			
							CT	AS +AT				Total
THEORY												
1.	DSC-10	DPCS-401	Introduction to Computer Network	3	1	0	20	10	30	70	100	4
2.	DSC-11	DPCS-402	Introduction to Database Management System	3	1	0	20	10	30	70	100	4
3.	DSC-12	DPCS-403	Introduction to Operating System	3	1	0	20	10	30	70	100	4
4.	DSC-13	DPCS-404	Java Programming	3	1	0	20	10	30	70	100	4
5.	DSC-14	DPCS-405	Basics of Computer Organization	3	1	0	20	10	30	70	100	4
PRACTICALS/ PROJECT												
6.	DSC-15	DPCS-451	Computer Network Lab	0	0	2	-	-	30	70	100	1
7.	DSC-16	DPCS-452	DBMS Lab	0	0	2	-	-	30	70	100	1
8.	DSC-17	DPCS-453	Operating System Lab	0	0	2	-	-	30	70	100	1
9.	DSC-18	DPCS-454	Java Programming Lab	0	0	2	-	-	30	70	100	1
10.	SEC-04	DPGP-401	General Proficiency	-	-	-	-	-	100	-	100	1
TOTAL				15	05	08	-	-	-	-	1000	25

Ability Enhancement Compulsory Course

S. No.	Section	Course Code	Course Name	Periods			Evaluation Scheme			Course Total	Credit	
				L	T	P	Mid Term Exam		External Exam			
							CT	AS +AT				Total
1.	AECC-01	PSC-401	Professional Communication	3	1	0	20	10	30	70	100	0

Note: Industrial Training of 4 – 6 weeks after IV Semester, which will be evaluated in V Semester

Abbreviation: DSC- Discipline Specific Course, AECC - Ability Enhancement Compulsory Course, SEC - Skill Enhancement Course

IFTM UNIVERSITY, MORADABAD
Department of Computer Science & Engineering
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(w.e.f. session 2022 – 2023)

STUDY AND EVALUATION SCHEME
YEAR III, SEMESTER-V

S. No.	Section	Course Code	Course Name	Periods			Evaluation Scheme			Course Total	Credit	
				L	T	P	Mid Term Exam		External Exam			
							CT	AS +AT				Total
THEORY												
1.	DSC-19	DPCS-501	System Administration	3	1	0	20	10	30	70	100	4
2.	DSC-20	DPCS-502	Computer Graphics & Multimedia	3	1	0	20	10	30	70	100	4
3.	DSC-21	DPCS-503	Introduction to Software Engineering Principles	3	1	0	20	10	30	70	100	4
Departmental Elective (Select any one)												
4.	DSE-01	DPCS-504	Introduction to Management Information System	3	1	0	20	10	30	70	100	4
	DSE-02	DPCS-505	E- Commerce									
Open Elective (Select any one)												
5.	DOE-01	DOEC-051	Industrial Management & Entrepreneurship Development	3	1	0	20	10	30	70	100	4
	DOE-02	DOCE-051	Disaster Management									
	DOE-03	NCC-01	NCC General									
PRACTICALS/ PROJECT												
6.	DSC-22	DPCS-551	System Administration Lab	0	0	2	-	-	30	70	100	1
7.	DSC-23	DPCS-552	Computer Graphics Lab	0	0	2	-	-	30	70	100	1
8.	SEC-05	DPCS-553	Industrial Training	0	0	2	-	-	100	-	100	1
9.	SEC-06	DPCS-554	Seminar	0	0	2	-	-	100	-	100	1
10.	SEC-07	DPGP-501	General Proficiency	-	-	-	-	-	100	-	100	1
TOTAL				15	05	08	-	-	-	-	1000	25

Abbreviation: DSC- Discipline Specific Course, SEC - Skill Enhancement Course, DSE - Discipline Specific Elective Course, DOE- Open Elective Courses

IFTM IFTM UNIVERSITY, MORADABAD
Department of Computer Science & Engineering
Diploma (Computer Science & Engineering)
(w.e.f. session 2022 – 2023)

STUDY AND EVALUATION SCHEME
YEAR III, SEMESTER-VI

S. No.	Section	Course Code	Course Name	Periods			Evaluation Scheme			Course Total	Credit	
				L	T	P	Mid Term Exam		External Exam			
							CT	AS +AT				Total
THEORY												
1.	DSC-24	DPCS-601	.Net Programming	3	1	0	20	10	30	70	100	4
2.	DSC-25	DPCS-602	Web Designing	3	1	0	20	10	30	70	100	4
3.	DSC-26	DPCS-603	Computer Hardware Maintenance	3	1	0	20	10	30	70	100	4
Departmental Elective (Select any one)												
4.	DSE-03	DPCS-604	Python Programming	3	1	0	20	10	30	70	100	4
	DSE-04	DPCS-605	Cloud Computing									
Open Elective (Select any one)												
5.	DOE-04	DOEE-061	Total Quality Management	3	1	0	20	10	30	70	100	4
	DOE-05	DOEE-061	Non-Conventional Energy Resources									
PRACTICALS/ PROJECT												
6.	DSC-27	DPCS-651	.Net Programming Lab	0	0	2	-	-	30	70	100	1
7.	DSC-28	DPCS-652	Web Designing Lab	0	0	2	-	-	30	70	100	1
8.	SEC-08	DPCS-653	Project	0	0	8	-	-	60	140	200	4
9.	SEC-09	DPGP-601	General Proficiency	-	-	-	-	-	100	-	100	1
TOTAL				15	05	12	-	-	-	-	1000	27

Abbreviation: DSC- Discipline Specific Course, SEC - Skill Enhancement Course, DSE - Discipline Specific Elective Course, DOE- Open Elective Courses

IFTM UNIVERSITY, MORADABAD
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Diploma (CSE) - I Year (I Semester)
(w.e.f. session 2022 – 2023)
DPPH 101: ELEMENTARY PHYSICS-I

Objective: This aim of this course is to impart knowledge in basic concepts of physics like unit, dimension, work, energy and power etc and their applications.

UNIT I **(08 Sessions)**

Unit and Dimensions

Physical quantities, Fundamental and derived units, Systems of unit (CGS, MKS and SI units), Dimensions and dimensional formulae of physical quantities (area, volume, velocity, acceleration, momentum, force, impulse, work, power, energy, surface tension, coefficient of viscosity and strain) , Dimensional equations and their uses with examples, Limitations of dimensional analysis.

UNIT II **(10 Sessions)**

Force and Motion

Scalar and vector quantities - examples, addition and multiplication of vectors, scalar product and vector product of vectors, Force, resolution and composition of forces – resultant, friction, law of friction and type of friction, Newton’s Laws of motion – concept of momentum, determination of force equation from Newton’s second law of motion, Newton’s third law of motion Conservation of momentum, impulse and impulsive forces, simple numerical problems, Circular motion (Definition), Relation between linear and angular velocity and linear acceleration and angular acceleration , Centripetal force (derivation) and centrifugal force Banking of roads, Definition of torque ,Planetary Motion, Newton’s law of gravitation, Kepler’s law of planetary motion, Escape velocity (derivation)

UNIT III **(08 Sessions)**

Work, Power and Energy

Work: definition and its units, Work done against friction in moving an object on horizontal and inclined plane (incorporating frictional forces),

Power: definitions and its units, calculation of power in simple cases,

Energy: Definitions and its units: Types: Kinetic energy and Potential energy, with examples and their derivation.

UNIT IV **(08 Sessions)**

Temperature and its measurement

Difference between heat and temperature on the basis of K.E. of Molecules, Principles of measurement of temperature and different scales of temperature, Transfer of Heat, Modes of transfer of heat (conduction, convection and radiation with examples), Coefficient of thermal conductivity, Properties of heat radiation. Prevost’s theory of heat exchange, Laws of black body radiations: Stefan’s law, Kirchoff’s law, Wien’s law.

UNIT V **(10 Sessions)**

Properties of Matter

Elasticity, stress and strain, Different types of modulus of elasticity, Surface tension- its units, measurement of surface tension by capillary tube method, applications of surface tension, effect of temperature and impurity on surface tension, Fluid motion, stream line and turbulent flow, Viscosity and coefficient of viscosity.

Course Outcomes:

Students completing this course will be able to:

CO1: Identify different systems of units and convert units from one system to another as well as conversant with practical units.

CO2: Represent physical quantities as scalar and vectors, applying physical laws and concept of linear and circular motion in everyday life.

CO3: Differentiate between work, energy and power.

CO4: Express physical work in terms of heat and temperature; measure temperature in various processes on different scales. Distinguish between conduction, convection and radiations

CO5: Understand the concept of elasticity, surface tension pressure and laws governing moment of fluid.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	3	2	3	2	2	1	1
CO 2	3	3	3	2	3	1	2	1
CO 3	3	3	3	3	2	1	1	2
CO 4	3	3	3	3	2	2	1	1
CO 5	3	3	3	2	3	1	1	2

Suggested Readings:

1. Concept of Physics, Prof. H.C. Verma, Part-1 (BhartiBhawan)
2. Concept of Physics, Prof. H.C. Verma, Part-2 (BhartiBhawan)
3. A Text Book of Applied Physics: Eagle Prkashan, Jullandhar

Website Sources:

- <https://thefactfactor.com>
- <https://i1.dainikbhaskar.com>
- <https://hplgit.github.io>
- <https://worldwidescience.org>
- <https://courses.lumenlearning.com>
- <https://www.machinedesign.com>
- <http://teacher.pas.rochester.edu>

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(w.e.f. session 2022 – 2023)
DPMA 101: ELEMENTARY MATHEMATICS-I

Objective: - To understand basics and applications of algebra, determinants, vectors, trigonometry and complex numbers. The focus of these topics in field to impart their knowledge in particular area of engineering branches and Comprehensive knowledge of basic mathematics.

UNIT I **(08 Sessions)**
Series : AP and GP; Sum of n terms, Partial fractions, Exponential and Logarithmic series, Binomial theorem for positive, Negative and fractional index (without proof) Application of Binomial theorem, Permutation & combination.

UNIT II **(10 Sessions)**
Determinants: Elementary properties of determinants of order 2 and 3, Consistency and solution of system of algebraic equation by Cramer's rule, Matrices, Type of matrix, Properties (addition, subtraction, multiplication, adjoint, inverse) of matrix.

UNIT III **(06 Sessions)**
Vector algebra: Dot and Cross product, Scalar and vector triple product, Application to work done, Moment of a force.

UNIT IV **(08 Sessions)**
Trigonometry: Relation between sides and angles of a triangle, Statement of various formulae showing relationship between sides and angles of a triangle, trigonometrically equations, Inverse trigonometric function.

UNIT V **(08 Sessions)**
 Complex numbers, Representation, Modulus and amplitude De-moiver's theorem and its application in solving algebraic equations, Mod, Function and its properties.

Course Outcomes:

CO1: Demonstrate basic knowledge of AP and GP; Sum of n terms, Exponential and Logarithmic series and also understands the basic concept of factorial notion in permutation, combination and binomial theorem.

CO2: To find area of triangle to understand properties to simplify determinants to solve system of equations using matrices.

CO3: Familiar with the basic concepts of scalar product, vector product, Triple products and multiple products.

CO4: To understand basics and applications of trigonometry in field to impart their knowledge and comprehensive of basic mathematics.

CO5: This course enables the students to learn the concept of imaginary numbers and gives awareness about algebra of complex numbers.

PO-CO Mapping (Please write 3,2,1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	3	2	3	2	2	1	1
CO2	3	3	3	2	3	1	3	2
CO3	3	3	3	3	2	3	3	2
CO4	3	3	3	3	2	3	1	2
CO5	3	3	3	2	3	1	3	2

Suggested Readings:

1. R.D. Sharma: Mathematics (I& II-XI), Dhanpat Rai Publication, Delhi.
2. B.S. Grewal :Engg. Mathematics by khanna Publishers, New Delhi.
3. H.R. Luthra : Applied Mathematics by Bharat Bharti Prakashan & Co. Meerut
4. Kailash Sinha : Applied Mathematics by Bharat Publication, Meerut
5. NCERT (XI & XII)

Website Sources:

- www.pdfdrive.com
- www.dmi.gov.in
- www.yourarticlelibrary.com
- onlinecourses.nptel.ac.in
- en.wikipedia.org

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(w.e.f. session 2022 – 2023)
DPCH 101: ELEMENTARY CHEMISTRY-I

Objectives: To emphasize the relevance of fundamentals and applications of chemistry for diploma holders and student will learn appropriate combinations of old and new emerging concepts. Also to bring potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

UNIT I **(08 Sessions)**

Structure Of Atom: Basic concepts of atomic structure, Matter wave concept, Schrodinger wave equation (excluding derivation) Quantum number, Heisenberg's Uncertainty Principle, Shapes of orbitals.

Chemical Bonding: Basic concepts, Hydrogen bonding, Valence bond theory, Hybridization, VSEPR theory, Molecular orbital theory as applied to diatomic homo nuclear molecules of first and second period elements, Co-ordination bond.

UNIT II **(08 Sessions)**

Periodic Classification Of Elements: Classification of elements (s, p, d and f block elements), Modern Periodic law, Periodic properties: Ionization energy electro negativity, Electron affinity,

UNIT III **(08 Sessions)**

Electro Chemistry: Arrhenius Theory of electrolytic dissociation, Transport number, Electrolytic conductance, Ostwald dilution law. Concept of Acid and bases: Bronsted, Arrhenius and Lewis theory. pH. Buffer solutions, Indicators, Solubility product, Common ion effect with their applications, Redox reactions, Electrode potential (Nernst Equation), Electro-chemical cells (Galvanic and Electrolytic). EMF of a cell and free energy change. Standard electrode potential, Electro chemical series and its applications., Laclanche's or dry cell, Acid storage cell (Lead accumulator) and Alkali stroge cell (Edison accumulator), Solar cell (Photovoltaic cell), Numerical problems based on topics.

UNIT IV **(08 Sessions)**

Chemical Kinetics: Introduction, rate of reaction, rate constant order and molecularity of reaction. Activation energy, Zero order First order and Second order (when initial concentration of both the reacrants are same) reactions.

Catalysis: Definition, Characteristics of catalytic reactions, Catalytic promoters and poison, Autocatalysis and Negative catalysis, Theory of catalysis, Application.

UNIT V **(08 Sessions)**

Solid State and Colloids

Solid State: Types of solids (Amorphous and Crystalline), Classification (Molecular, Ionic, Covalent, Metallic), Band theory of solids (Conductors, Semiconductors and Insulators), types of Crystals, FCC, BCC, Crystal imperfection

Colloids: Colloids and its types, Different system of colloids, Dispersed phase and dispersion medium. Methods of preparation of colloidal solutions, Dialysis and electro-dialysis. Properties of colloidal solution with special reference to adsorption, Brownian Movement, Tyndal effect, Electrophoresis and coagulation. Gold number, Application of colloids.

Course Outcome:

Upon successful completion of this course students should be able to:

CO1: Describe atomic structure, concept of matter-wave chemical bonding and solid state

CO2: Describe the periodic table as a list of elements to demonstrate trends in their physical and chemical properties.

CO3: Understand the concept of conductance and electrochemistry as well as determine the EMF of the cells.

CO4: Evaluate rate constant of a reaction as well as understand theories of reaction rates.

CO5: Apply the concepts of sol, gel and emulsions to various solutions.

PO-CO Mapping (Please write 3,2,1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	3	2	3	2	2	1	1
CO2	3	3	3	2	3	1	3	2
CO3	2	3	3	2	2	3	1	3
CO4	3	3	2	3	2	3	1	2
CO5	3	2	3	2	3	1	3	3

Suggested Readings:

1. Liquid Crystals and Plastic Crystals, vol.-I, edited by G.W. Gray and P.A. Winsor, Ellis Harwood Series in Physical Chemistry, New York.
2. Corrosion Engineering by M.G. Fontana McGraw Hill Publications.
3. Engineering Chemistry by J C Kuriacose and J. Rajaram, Tata McGraw-Hill Co, New Delhi (2004).
4. Chemistry of Engineering Materials by C.P. Murthy, C.V. Agarwal and A. Naidu BS Publication Hyd.

Website Sources:

- <http://www.commonchemistry.org/>
- <https://uri.idm.oclc.org/login?url=https://www.engineeringvillage.com/search/quick.url?CID=quickSearch&database=1>
- <https://www.technicalsymposium.com/>

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DPME 101/DPME 201: ELEMENTARY ENGINEERING MECHANICS

Objective:

The primary objectives of elementary engineering mechanics course are to help the student develop this ability to visualize. This is so vital to problem formulation purpose of the study of elementary engineering mechanics. To develop the capacity to predict the effects of force and motion while carrying out the creative design functions of engineering.

UNIT I

(08 Sessions)

Introduction: Mechanics and its utility. Concept of scalar and vector quantities. Effect of a force. Tension & compression. Rigid body. Principle of physical independence of force. Principle of transmissibility of a force.

UNIT II

(08 Sessions)

System of Forces: Concept of co-planer and non-co-planer forces including parallel forces. Concurrent and non-concurrent forces. Resultant force. Equilibrium of forces. Law of parallelogram of forces. Law of triangle of forces and its converse. Law of polygon of forces. Solution of simple engineering problems by analytical and graphical methods such as simple wall crane, jib crane and other structures. Determination of resultant of any number of forces in one plane acting upon a particle, conditions of equilibrium of co-planer concurrent force system.

UNIT III

(08 Sessions)

Moment & couple: Concept of Varignon's theorem. Generalized theorem of moments. Application to simple problems on levers-Bell crank lever, compound lever, steel yard, beams and wheels, lever safety valve, wireless mast, moment of a couple; Properties of a couple ; Simple applied problems such as pulley and shaft.

UNIT IV

(08 Sessions)

General Condition of Equilibrium: General condition of equilibrium of a rigid body under the action of co-planer forces, statement of force law of equilibrium, moment law of equilibrium, application of above on body.

Friction: Types of friction: statically, limiting and dynamical friction, statement of laws of sliding friction, Coefficient of friction, angle of friction; problems on equilibrium of a body resting on a rough inclined plane, simple problems on friction. Conditions of sliding and toppling.

UNIT V

(08 Sessions)

Stresses and strains: Concept of stress and strain. Concept of various types of stresses and strains. Definitions of tension, compression shear, bending, torsion. Concept of volumetric and lateral strains, Poisson's ratio. Changes in dimensions and volume of a bar under direct load (axial and along all the three axes). Ultimate stress, working stress. Elasticity, Hook's law, load deformation diagram for mild steel and cast iron. Definition of modulus of elasticity, yield point, modulus of rigidity and bulk Modulus. Stresses and strains for homogeneous materials and composite sections.

Course Outcomes:

Students completing this course will be able to:

CO1: Makes the students able to recognize different force systems, moments and couples.

CO2: The ability to draw Free Body Diagram and label the reactions to it & makes the students' abilities to apply equilibrium equations in statics.

CO3: The ability to understand Newton's law in motion, and recognize different kinds of particle motions.

CO4: The ability to find the moment and the couple.

CO5: Acquire knowledge about stress and strain and how to find in different parts in different conditions.

PO-CO Mapping (Please write 3,2,1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	3	3	2	1
CO2	3	2	3	1	2	2	2	3
CO3	3	2	1	2	3	1	1	3
CO4	3	2	3	1	2	2	2	3
CO5	3	2	1	2	1	2	3	3

Suggested Reading:

1. Engineering Mechanics by Irving H. Shames, Prentice-Hall
2. Mechanics of Solids by Abdul Mubeen, Pearson Education Asia.
3. Mechanics of Materials by E.P.Popov, Prentice Hall of India Private Limited.
4. Engineering Mechanics by R.K Bansal
5. Applied Mechanics by J.K.Kapoor, Bharat BhartiPrakashan.

Website Sources:

- www.onlinecourses.nptel.ac.in
- www.pdfdrive.com/engineering-mechanics-books.html
- https://en.wikibooks.org/wiki/Engineering_Mechanics
- <http://library.iitj.ac.in/sp/subjects/guide.php?subject=ERL>

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DPCS 101/ DPCS 201: COMPUTER FUNDAMENTALS AND PROGRAMMING IN C

Objective: To study about understanding of basic concepts of computer fundamentals, operating system, primary and secondary memory in detail, peripheral devices and basic concepts of C programming language.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(09 Sessions)**

Introduction to Computer: Definition, Characteristics, Generation of Computers, Capabilities and Limitations, Introduction to Operating System, Concept of Bios, Booting Files, Basic Components of a Computer System- Control Unit, ALU, Input/output functions and characteristics. Memory Introduction, Classifications- Volatile Memory and Non- Volatile, Flash Memory, ROM, RAM, EPROM, PROM, EEPROM other types of memory.

UNIT II **(07 Sessions)**

Input/output and storage Units: Computer Keyboard, Pointing Devices: Mouse, Trackball, Touch Panel, and Joystick, Light Pen, Scanners, Various types of Monitors, Touch-sensitive screens, Optical Recognition System, Pen based systems, Digitizers, MICR, OCR, OMR, Bar-code Reader, digital camera. Hard Copy Devices:- Impact and Non- Impact Printers- Daisy Wheel, Dot Matrix, Line Printer, Chain Printer, Comb Printers, Non Impact Printers- DeskJet, Laser Printer, Thermal Transfer Printer, Barcode Printers, Electro static printers and plotters, High Level Language and Low-Level Language, Firmware, Compiler, Interpreter and Assembler.

UNIT III **(12 Sessions)**

Introduction and Features of “C” language: The structure of “C” program , Identifiers and Keywords, Constants, Variables, Scope of variables, Typedef, Type Conversion, Arithmetic Operators, Library Functions, Input/output Statements, getchar(), putchar(), scanf, printf, Compound statements and block. Relational Operators, Logical Operators, Bitwise Operators, Unary Operators, if-else Statement, Operators, Switch statement, go to statement and Label, Iteration statements: For Loop, While Loop, Do While Loop, Nested Loop, Continue and Break statements.

UNIT IV **(06 Sessions)**

Array and Structures: Declaration, Concept of One Dimensional and Multi Dimensional arrays, Defining Structure, Declaration of Structure Variable, Accessing Structure members, nesting of structures, Array of structures.

UNIT V **(08 Sessions)**

Difference between Union and Structure: Functions: Need of “C” function, User Defined and Library Functions, Prototype of Function, Call by Value, Call by Reference, Nesting of Functions, Recursion, Array as Function Argument, Structure as Function Argument.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understand about basic computer fundamental and its major components.
CO2	To gain the knowledge about input and output devices.
CO3	Understanding the features of the C language, keyword, data type and statements in C
CO4	Understand about array and structure in detail
CO5	Gain the knowledge of functions in C language, union and structure

PO-CO Mapping (Please write 3,2,1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	3	1	2	2	2	3
CO2	3	2	1	2	1	2	3	3
CO3	3	2	1	2	3	1	1	3
CO4	3	2	3	1	2	2	2	3
CO5	3	2	1	2	3	3	2	1

Suggested Readings:

1. Computer Fundamentals B. Ram
2. Computer fundamentals P.K Sinha (BPB Publications)
3. Programming in Ansi C E. balagurusamy (3rd edition McGraw Hill)

Website Sources:

- https://www.tutorialspoint.com/computer_fundamentals/index.htm
- <https://www.javatpoint.com/computer-fundamentals-tutorial>
- <https://www.w3schools.in/c-tutorial/>
- <https://www.geeksforgeeks.org/difference-between-input-and-output-devices/>
- [https://en.wikipedia.org/wiki/C_\(programming_language\)](https://en.wikipedia.org/wiki/C_(programming_language))
- <https://www.cprogramming.com/>

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DPME 102/DPME 202: WORKSHOP TECHNOLOGY

Objective: The subject aims at imparting knowledge and skill components in the field of basic workshop technology. It deals with different hand and machine tools required for manufacturing simple metal components and articles. The primary objectives of this subject are to understand how different objects can be made from the given raw material by using different mechanical machines and tools.

UNIT I **(08 sessions)**

GENERAL INTRODUCTION: Scope of subject "Workshop Technology" in engineering. Different shop activities and broad division of the shops on the basis of nature of work done such as (i) Wooden Fabrication (Carpentry) (ii) Metal Fabrication (shaping and Forming, Smithy, Sheet metal and Joining-welding, Riveting, Fitting and Plumbing.

UNIT II **(08 sessions)**

CARPENTRY: Timber, seasoning of timber, types of seasoning. Common Carpentry Tools-Their classification, size, specification (name of the parts and use only)., Fundamental wood working operations, Marking & Measuring, Holding & Supporting, Cutting & Sawing, Drilling & Boring, Turning, Jointing;

UNIT III **(08 sessions)**

METAL FABRICATION: Metal Shaping-Smithy: Operations involved (concept only. Tools and equipment used (Names, size, specification for identification only). Defects likely to occur during and after operations their Identification and Remedy. Defects due to wrong operation, wrong tool and wrong heating. Safety of Personnel, Equipment & Tools to be observed. Sheet metal working: Tools and Operations involved (Names and concept only); Sheet metal joints - Lap, seam, Locked seam, hemp, wire edge, cup or circular, Flange, angular and cap. Common defects -Their identification and remedy. Defects due to wrong operation or wrong tool. Safety of Personnel, Equipment & Tools to be observed.

Metal Joining During Fabrication: Permanent Joining-Welding methods-Forge welding, gas welding (high and low pressure-oxyacetylene welding, types of flames. Electric Arc welding- D.C. & A.C., Connected tools, operation, materials and safety measures. Soldering & Brazing:

Familiarity with the use of Various Tools Used in Mechanical Engineering Workshop: Marking & Measuring, Holding Tools. Cutting Tools.

Hack saw (Fixed and Adjustable frame), chisels. Finishing tools-Files. Drills and Allied Tools. Miscellaneous Tools.

UNIT IV **(08 sessions)**

MACHINE SHOP: Introduction to machine tools viz lathe, drilling machine, shaper and planer simple line and block diagram of components and their functions. Brief concept of NC and CNC machines.

UNIT V **(08 sessions)**

Foundry: Basic idea of types of sands, patterns, moulds, furnaces and simple green sand moulding process.

Course Outcomes:

Students completing this course will be able to:

CO1: Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry and welding.

CO2: Ability to design and model different prototypes in the carpentry trade such as Cross lap joint, Dove tail joint.

CO3: Ability to design and model various basic prototypes in the trade of Welding such as Lap joint, Lap Tee joint, Edge joint, Butt joint and Corner joint.

CO4: Acquire "Hands on" training and practice to students for use of various tools, devices and machines.

CO5: Understand the Metal casting Techniques and basic structure of products.

PO-CO Mapping (Please write 3,2,1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	3	1	2	2	2	3
CO2	3	2	3	2	1	2	3	2
CO3	2	3	1	2	3	1	1	2
CO4	3	2	3	3	2	2	2	3
CO5	3	3	1	2	3	1	3	1

Suggested Reading:

1. Manufacturing Process by- B.S Raghuvanshi (Dhanpat Rai & Co.)
2. Elementary Workshop Technology by- S.K HazraChaudhary (Media Promoters)
3. Workshop Practice by- S.K Garg (University Science Press)
4. Elementary Workshop Technology by J.K. Kapoor, Bharat Bharti Prakashan.

Website Sources:

- www.onlinecourses.nptel.ac.in
- <https://www.pdfdrive.com/introduction-to-basic-manufacturing-processes-and-workshop-technology-e33408290.html>
- https://books.google.co.in/books/about/Workshop_Technology.html?id=m6lDDAAAQBAJ&redir_esc=y

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - I Year (I/II Semester)
(w.e.f. session 2022 – 2023)

DPEE 101/ DPEE 201: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Objective: The objective of this course is to provide an understanding of basic terms related to the electrical and electronics engineering. It provides knowledge of basic elements used in electrical and electronics circuits, to develop the capability of analyzing and design simple electrical networks, an understanding of basic principle of various network theorems, an introductory knowledge of single phase and three phase AC supply, an introductory knowledge of semiconductor materials and devices manufactured by them like a PN junction diode and Bipolar Junction Transistor.

UNIT I

(08 Sessions)

Basic Terminology & Their Concepts : Current, EMF, Potential difference, Resistance, Resistivity, & their units, Variation of resistance with temperature, Series & parallel connection of resistors, conductors and insulators, Electrical power & energy, Concept of inductance & mutual inductance, mutually induced emf and its role in electric circuits. Energy stored in an inductor, Concept of capacitor, parallel plate capacitor & its capacitance, energy stored in a capacitor, Dielectric and its influence on the capacitance of a capacitor. Charging & discharging of capacitor. Simple numerical problems

UNIT II

(08 Sessions)

D.C. Circuits: Kirchoff's laws-KCL & KVL, simple numerical problems.

Network Theorems- Thevenin's theorem, Norton's theorem, Superposition & Maximum power transfer Theorem, Simple numerical problems based on them

UNIT III

(08 Sessions)

A.C. Circuits: Instantaneous value, RMS value, Peak value, Average value. Form factor & peak factor of a sine wave. Concept of phase, phase difference & phasor representation of ac voltage & current, R-L, R-C, R-L-C circuits, Active & Reactive power, power factor Simple numerical problems.

Poly-phase Systems: Advantages of a 3 phase system over single phase system, Star & Delta connections & their conversion, Relationship between phase & line values of currents and voltages, Power in 3 phase system

UNIT IV

(08 Sessions)

Magnetic Circuits: Magnetic circuit concepts- magnetic field intensity, magneto motive force, magnetic flux density, Permeability, Reluctance, Determination of Ampere turns, Kirchoff's Law for magnetic circuit, Analogy between magnetic and electric circuits, Composite magnetic circuits, B-H characteristics, Hysteresis loss

UNIT V

(08 Sessions)

Semiconductors: Classification of solids- conductors, Insulators & semiconductors, Intrinsic & Extrinsic semiconductors, P-N junction- biasing, VI characteristics of a diode.

Bipolar Junction Transistors: Biasing, working of NPN & PNP transistor, Transistor configurations- common emitter, common base common collector configurations and their characteristics, Transistor as an Amplifier, Simple numerical problems, Transistor as a switch-use of transistor as a switch for logic gates.

Combinational logic circuits: Logic gates- AND, OR, NOT, Exclusive OR, NAND & NOR gates with their truth tables

Course Outcomes:

Students completing this course will be able to:

CO1: The students are able to explain the various types of electrical and electronics circuits.

CO2: Can solve a simple type of electrical network problems.

CO3: It imparted the understanding of single phase and three phase AC supply and also the superiority of three phase supply over single phase supply.

CO4: Students got an idea about magnetic field and how it is utilized.

CO5: The students have got an understanding of applications of semiconductor materials and devices based on them.

PO-CO Mapping (Please write 3,2,1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	3	1	2	2	2	3
CO2	3	2	1	2	1	2	3	3
CO3	3	2	1	2	3	1	1	3
CO4	3	2	3	1	2	2	2	3
CO5	3	2	1	2	3	3	2	1

Suggested Readings:

1. Electrical Engineering by Ashfaq Hussain, Dhanpat Rai & Co.
2. Electrical Engineering by J.S. Katre. Tech. Max Publications.
3. Electrical Engineering vol.-1. By B.L. Thareja-Technical Publications.
4. Basic Electrical Engineering by I.J. Nagarath, Tata McGraw Hill
5. Electrical and Electronics Engineering by S.K. Sahdev

Web Resources:

- www.engineering.nyu.edu
- www.elprocus.com/basics-of-network-theorems-in-electrical-engineering/
- www.electricalclassroom.com
- www.electronics-tutorials.ws/electromagnetism
- <https://nptel.ac.in/courses/108/108/108108076/>

IFTM UNIVERSITY, MORADABAD
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Diploma (CSE) - I Year (I Semester)
(w.e.f. session 2022 – 2023)
FEC 101: FUNDAMENTALS OF ENGLISH COMMUNICATION

Objectives: The objectives of Fundamentals of English Communication are:

- To develop knowledge and understanding of grammar.
- To develop abilities to make use of the grammar in own writing English.
- To increase understanding and recall of what is read and listen including facts and main idea.
- To enhance competencies in writing paragraph, gist or abstract/précis of the passage in own words/ language and in writing letters and applications of different kinds.

UNIT I: Basic Applied Grammar and Usage **(06 Sessions)**

The Sentences: Kinds of Sentences; Subject and Predicate
Phrases & Clauses, Idioms & Proverbs

UNIT II: Basic Applied Grammar Continued **(08 Sessions)**

Nouns: Kinds; Singular/Plural; Gender; Possession
Pronouns: Kinds; Usage
Adjectives: Kinds; Degrees of Comparison; Usage
Determiners: Kinds, Usage of Adjectives and Determiners

UNIT III: Basic Applied Grammar Continued **(08 Sessions)**

Articles: Kinds, Omission of Articles, Repetition of Articles, Spotting the Errors
Verbs: Kinds-Transitive and Intransitive, Finite and Non Finite Verbs
Tenses:Kinds; Usage

UNIT IV: Basic Applied Grammar Continued **(06 Sessions)**

Adverbs: Kinds; Position of Adverbs; Usage
Prepositions: Kinds; Correct Usage, Fill in the Blanks
Conjunctions:Kinds, Conversion of Compound to Complex Sentences and Vice-versa
Interjections: Definition and Types

UNIT V: Comprehension and Précis Writing **(10 Sessions)**

Reading Comprehension
Précis Writing:Techniques of Précis Writing and Exercises
Formal Letter Writing:Leave Application (for different reasons), Application for Fee
Concession and Invitation (for family and friends)

Course Outcomes:

The students completing this course will be able to:

CO1: Have thorough knowledge of kinds and parts of sentences and to use idioms and proverbs in day to day communication.

CO2: Use Noun, Pronoun, Adjective and determiners correctly.

CO3: Have knowledge of using Articles, Verbs and Tenses and to correct the sentences.

CO4: Frame different kinds of Sentences: double/ compound and complex using Adverb and Preposition and to express strong feelings and emotions in the words.

CO5: Write answer correctly and precisely on the basis of Reading comprehension and to write the letters and applications for different reasons.

PO-CO Mapping (Please write 3,2,1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	3	3	2	1
CO2	3	2	1	2	1	2	3	3
CO3	2	3	3	2	3	2	1	2
CO4	3	2	3	1	2	2	2	3
CO5	3	3	1	2	3	1	1	3

Suggested Readings:

1. Professional Communication by MultiAgarwal, Krishna Publications.
2. High School English Grammar & Composition by Wren & Martin, S. Chand & Company LTD., New Delhi.

Website Sources:

- www.wikipedia.org
- www.english grammar.org
- www.perfect-english-grammar.com
- www.sucesscds.net
- www.grammarly.com

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - I Year (I/II Semester)
(w.e.f. session 2022 – 2023)
DPME 151/DPME 251: ENGINEERING DRAWING LAB

Objective:

- To get the primary concept of Engineering Drawing.
- To know about equipments in Engineering Drawing.
- To know various signs, lines and dimensions.
- To know about the Principles of Projection: Orthographic Projections, Isometric Projection.

1. Drawing, instruments and their uses.

- 1.1 Introduction to various drawing, instruments.
- 1.2 Correct use and care of Instruments.
- 1.3 Sizes of drawing sheets and their layouts.

2. (a) Lettering Techniques

Printing of vertical and inclined, normal single stroke capital letters.

Printing of vertical and inclined normal single stroke numbers. Stencils and their use. **(1 Sheet)**

(b) Introduction to Scales Necessity and use, R F Types of scales used in general engineering drawing. Plane, diagonal and chord scales. **(1 Sheet)**

3. Conventional Presentation :

Thread (Internal and External), Welded joint, Types of lines, Conventional representation of materials, Conventional representation of machine parts. **(2 Sheet)**

4.(a) Principles of Projection

Orthographic, Pictorial and perspective. Concept of horizontal and vertical planes. Difference between I and III angle projections. Dimensioning techniques. **(1 Sheet)**

(b) Projections of points, lines and planes. **(1 Sheet)**

5.(a) Orthographic Projections of Simple Geometrical Solids Edge and axis making given angles with the reference planes. Face making given angles with reference planes. Face and its edge making given angles with reference planes.

(b) Orthographic views of simple composite solids from their isometric views.

(c) Exercises on missing surfaces and views **(3 Sheet)**

6. Section of Solids Concept of sectioning Cases involving cutting plane parallel to one of the reference planes and perpendicular to the others. Cases involving cutting plane perpendicular to one of the reference planes and inclined to the others plane, true shape of the section **(1 Sheet)**

7. Isometric Projection. (2 Sheet)

Isometric scale Isometric projection of solids.

8. ORTHOGRAPHIC PROJECTION OF MACHINE PARTS: (2 Sheet)

Nut and Bolt, Locking device, Wall bracket

Course Outcome:

After successful completion of this course, students will be able to

CO1: A clear conception and appreciation of the shape, size, proportion and design.

CO2: Learning how to draw the shapes, angles and lines and others which is essential for engineer.

CO3: Develop student's imagination and ability to represent the shape size and specifications of physical objects.

CO4: Understand the main idea of using dimension for engineering drawing.

CO5: Explain the principle of projection and sectioning.

Suggested Reading:

1. Engineering Drawing by- B. Agrawal and C.M. Agrawal (McGraw Hill Education (India) Pvt. Ltd.)
2. Engineering Drawing by K. Venkata Reddy (BS Publication).
3. Engineering Drawing by R. K. Dhawan (S Chand Publication)

Website Sources:

- https://www.google.co.in/books/edition/Engineering_Drawing/VRf-AwAAQBAJ?hl=en&gbpv=1&printsec=frontcover
- <https://www.engbookspdf.com/Drawing/textbook-of-engineering-drawing-second>
- https://www.google.co.in/books/edition/A_Textbook_of_Engineering_Drawing_In_Fir/vTd3cJ91-RwC?hl=en&gbpv=1&printsec=frontcover

IFTM UNIVERSITY, MORADABAD
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Diploma (CSE) - I Year (I/II Semester)
(w.e.f. session 2022 – 2023)
DPCS 151 / DPCS 251: COMPUTER PROGRAMMING LAB

Objective: To study about understanding of basic concept of Windows Operating System, understanding of the fundamentals of programming such as data types, keywords, variables, array, structure, conditional and iterative execution, methods, etc.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments:

1. Introduction to GUI using Windows Operating System, DOS Commands,
2. Introduction to Word, Introduction to MS-Excel.
3. WAP in C to print your name.
4. WAP in C for adding, subtraction, multiplication & division of two numbers.
5. WAP in C to calculate the area of a circle, rectangle and triangle.
6. WAP to Convert Celsius to Fahrenheit.
7. WAP to find out whether the given year is a leap year or not.
8. WAP in C to find whether the given number is even or odd.
9. WAP to use switch statement display Monday to Sunday.
10. WAP to print table of given number.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understand about GUI using windows operating system and DOS commands.
CO2	To understand how to write and execute C programs.
CO3	Execute statements in C language
CO4	Implement C programs with the help of array, structure and nesting of structure.
CO5	Execute C programs with the help of functions.

Suggested Readings:

1. Computer Fundamentals B. Ram
2. Computer fundamentals P.K Sinha (BPB Publications)
3. Programming in Ansi C E. balagurusamy (3rd edition McGraw Hill)

Website Sources:

- <https://www.programiz.com/c-programming#introduction>
- <https://www.javatpoint.com/c-programming-language-tutorial>
- <https://www.w3schools.in/c-tutorial/>
- <https://www.tutorialspoint.com/cprogramming/index.htm>[https://en.wikipedia.org/wiki/C_\(programming_language\)](https://en.wikipedia.org/wiki/C_(programming_language))
- <https://www.cprogramming.com/>

IFTM UNIVERSITY, MORADABAD
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Diploma (CSE) - I Year (I Semester)
(w.e.f. session 2022 – 2023)
DPPH 151: PHYSICS-I LAB

Objective: The main goal of this course is to share the knowledge to the students about the experiments so that students will get a better understanding of the concepts studied by them in the theory course and correlate with experimental observations.

List of Experiments:

1. To find the surface tension of a liquid by Jaeger's method.
2. To find volume of solid cylinder and hollow cylinder using a Vernier caliper.
3. To determine the atmospheric pressure at a place using Fortin's Barometer.
4. To determine the thickness of glass strip and radius of curvature of a concave surface using a speedometer.
5. To determine the time period of simple pendulum and plot a graph between l & t
6. To determine the acceleration due to gravity with the help of a Bar Pendulum.
7. To determine the coefficient of viscosity of water with the help of Poissuille method.
8. Verify parallelogram Law of forces.
9. To determine the modulus of rigidity (η) of the material of wire with the help of torsional pendulum using the inertia table
10. To find the thickness of wire using a screw gauge.

Course Outcomes:

Students completing this course will be able to:

CO1: Use the different measuring devices and meters to record the data with precision

CO2: Measurement of surface tension, volume and atmospheric pressure.

CO3: Determine coefficient of viscosity and modulus of rigidity

CO4: Measurement of thickness of wire.

CO5: Apply the various procedures and techniques for the experiments.

Suggested Readings:

1. Concept of Physics, Prof. H.C. Verma, Part-1 (BhartiBhawan)
2. Concept of Physics, Prof. H.C. Verma, Part-2 (BhartiBhawan)
3. A Text Book of Applied Physics: EgaleParkashan, Jullandhar

Website sources:

- <http://dspace.wbpublibnet.gov.in>
- <https://www.scribd.com>
- <http://www.brainkart.com>
- <https://dkpandey.weebly.com>
- <https://images.topperlearning.com>

IFTM UNIVERSITY, MORADABAD
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Diploma (CSE) - I Year (I Semester)
(w.e.f. session 2022 – 2023)
DPCH 151: CHEMISTRY-I LAB

Objectives: Practical implementation of fundamental concepts of qualitative and quantitative analysis. Student will gain the knowledge on existing future upcoming devices, materials and methodology used in chemistry practical. They will rely on elementary treatment and qualitative analysis. These practical will provide an overview of quantitative analysis.

List of Experiments:

1. To analyse inorganic mixture for two acid and basic radicals from following radicals
A. Basic Radicals: NH_4^+ , Pb^{++} , Cu^{++} , Bi^{+++} , Cd^{++} , As^{+++} , Sb^{+++} , Sn^{++} , Al^{+++} , Fe^{+++} , Cr^{+++} , Mn^{++} , Zn^{++} , Co^{++} , Ni^{++} , Ba^{++} , Sr^{++} , Ca^{++} , Mg^{++}
B. Acid Radicals: CO_3^{--} , S^{--} , SO_3^{--} , CH_3COO^- , NO_2^- , NO_3^- , Cl^- , Br^- , I^- , SO_4^{--}
2. To determine the percentage of available Chlorine in the supplied sample of bleaching powder.
3. To determine the total hardness of water sample in terms of CaCO_3 by EDTA titration method using Eriochroma black-T indicator.
4. To determine the strength of given HCl solution by titration against NaOH solution using Phenolphthalein as indicator.
5. To determine the Chloride content in supplied water sample by using Mohr's methods.
6. Determination of temporary hardness of water sample by O- Hener's method.

Course Outcome:

CO1: Demonstrate laboratory techniques in chemistry, including analysis of acidic and basic radicals, bleaching powder, hardness and chloride content in water sample.

CO2: Demonstrate the ability to safely and effectively perform experiments, using proper glassware set-up, handling of hazardous chemicals, and following the prescribed experimental procedures.

Suggested Readings:

1. Applied Chemistry by R. S. Katiyar & J.P. Chaudhary Publication B.B.P. & Co. Meerut
2. March's Advanced Organic Chemistry: Reactions, Mechanisms and Structure Smith, Michael B./March, Jerry, John Wiley & sons, 6th Edition, 2007.
3. Elements of Physical Chemistry, Glasstone, Samuel B. ELBS, 2005.
4. Organic Chemistry, Finar, I.L.: Addison – Wesley Longman, Limited, 2004.
5. Principles of Physical Chemistry, by Puri B.R., Sharma L.R., S. Nagin & Company, Delhi

Website Sources:

- <https://www.gopracticals.com/basic-engineering/>
- <https://edu.rsc.org/resources/practical>
- <https://play.google.com/store/apps/details?id=com.softwareindiavinod.chemistrypracticals&hl=en&gl=US>

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - I Year (I/II Semester)
(w.e.f. session 2022 – 2023)
DPME 152/DPME 252: WORKSHOP LAB

Objective:

1. To understand how different objects can be made from the given raw material by using different mechanical tools.
2. To introduce students to the basic concepts of manufacturing via shaping, forming, machining
3. To develop a knowledge of appropriate parameters to be operations used for various machining.
4. To develop a knowledge of workshop practice and basic use of machine tools and workshop equipment.

1. Carpentry Shop:

EX-1 Introduction & demonstration of tools used in carpentry shop

EX-2 Planning and sawing practice

EX-3 Making of lap joint

EX-4 Making of mortise and tenon joint

EX-5 Making of bridle joint

EX-6 Making of dovetail joint

EX-7 Making of any one utility article such as wooden picture frame, hanger, peg, name plate, etc.

2. Sheet Metal Working and Soldering Shop:

EX-1 Introduction & demonstration of tools used in Sheet metal working shop.

EX-2 Cutting, shearing and bending of sheet.

EX-3 To prepare a soap case by the metal sheet.

EX-4 To make a funnel with thin sheet and to solder the seam of the same.

EX-5 To make a cylinder and to solder the same.

EX-6 Preparation of different type of joints such as Lap joint-single seam, double seam. Hemp and wired joints.

EX-7 Study and sketch of various types of stakes/anvil.

EX-8 To braze small tube/conduit joints.

3. Fitting Shop :

EX-1 Introduction & demonstration of tools used in Fitting Shop.

EX-2 Hack sawing and chipping of M.S. flat.

EX-3 Filing and squaring of chipped M.S. job.

EX-4 Filing on square or rectangular M.S. piece.

EX-5 Making bolt & nut by tap and die set.

EX-6 To drill a hole in M.S. Plate and tapping the same to create threads as per need.

EX-7 Utility article-to prepare a screw driver or paper weight, double open mouth spanner for 18" hexagonal head of a bolt.

4. Plumbing Shop:

EX-1 Cutting and threading practice for using socket, elbow and tee etc. and to fit it on wooden practice board.

EX-2 Study of bib cock, cistern or stop cock, wheel valve and gate valve etc.

5. Smithy Shop :

EX-1 Study & Sketch of Tools used in smithy shop.

EX-1 To prepare square or rectangular piece by the M.S. rod.

EX-2 To braze M.S. Flats/Tipped tools on M.S. shank.

EX-3 To make a screw driver with metallic handle.

EX-4 To make a square or hexagonal head bolt.

EX-5 To make a ring with hook for wooden doors.

EX-6 Utility article-to prepare a ceiling fan hook.

6. Welding Shop :

EX-1 Welding practice-gas and electric.

EX-2 Welding for lap joint after preparing the edge.

EX-3 Welding of Butt joint after preparation of the edge.

EX-4 'T' joint welding after preparation of edge.

EX-5 Spot welding, by spot welding machine.

EX-6 Welding of plastic pieces by hot strip method.

EX-7 Welding practice by CO₂ gas welding

7. Machine Shop

EX-1 Study & sketch of lathe machine.

Ex-2 Plain and step turning & knurling practice.

Ex-3 Study and sketch of planing/Shaping machine and to plane a Rectangle of cast iron.

8. Fastening Shop

EX-1 Practice of bolted joints

EX-2 To prepare a rivetted joint

EX-3 To make a pipe joint

EX-4 To make a threaded joint

EX-5 Practice of sleeve joint

Course Outcome:

After successful completion of this course, students will able to

CO1: Acquire skills in basic engineering practice.

CO2: Identify the hand tools and instruments, gain measuring skills and Obtain practical skills in the trades.

CO3: Read and use a manufacturing drawing as a definition for the manufacturing of a part.

CO4: Select proper tools and cutting data for a given material and manufacturing process.

CO5: Identify safe welding practices and procedures conforming to Welding standards.

Suggested Reading:

1. A Textbook of Workshop Technology: Manufacturing Processes by R.S Khurmi and J.K Gupta (S Chand).
2. Introduction to Basic Manufacturing Processes and Workshop Technology by Rajender Singh

Website Sources:

- https://www.abebooks.com/servlet/BookDetailsPL?bi=30061491479&cm_sp=rec-_-pd_hw_i_1-_-bdp&reftag=pd_hw_i_1
- https://www.google.co.in/books/edition/Introduction_to_Basic_Manufacturing_Proc/ky7r-BclY8cC?hl=en&gbpv=1&pg=PP1&printsec=frontcover

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(w.e.f. session 2022 – 2023)

DPEE-151/DPEE-251: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

Objective: The objective of this lab is to provide an understanding of basic electrical and electronic components used in various types of circuits, to know how the basic principles of electrical and electronic engineering like Ohm's Law, KCL, KVL work. To know about how the electricity consumed in a circuit is measured by the energy meter. To know how the resistance of a filament varies according to temperature, to know the working of electronic devices like a PN junction diode and NPN/PNP transistors and logic gates.

List of Experiments:

1. To study and identify the various components.
2. To verify Ohm's Law.
3. To verify Kirchhoff's Current Law (KCL).
4. To verify Kirchhoff's Voltage Law (KVL).
5. To observe the variation of resistance of a lamp with temperature by plotting V-I curve for 60 W and 100 W filaments lamp.
6. To study Star to Delta and Delta to Star conversion.
7. To verify the truth table of OR, AND, NOT, NAND, NOR and EXOR logic gates.
8. To study and plot V-I characteristics of a PN junction diode.
9. To study the biasing and working of NPN/PNP transistor.
10. To study a single phase Induction type energy meter.

Course Outcomes:

Students completing this course will be able to:

CO1: The students are able to know the identification and application of the various types of components used in electrical and electronics circuits.

CO2: Can understand how Ohm's Law works and its limitations.

CO3: It imparted the understanding of KCL, KVL and their applications.

CO4: Students got an idea about the variation of resistance with temperature and working principle of an energy meter & its use.

CO5: The students have got an understanding of working and application of semiconductor devices.

Suggested Readings:

1. Handbook of laboratory experiments in electronics engineering by A.M. Zungeru
2. Basic electrical and electronics lab by Bharat Bhushan Jain
3. Laboratory Manual for Introductory Electronics Experiments by L.K. Maheshwari.

Website Sources:

- www.concept-of-physics.com/electromagnetism/verification-of-ohms-law-using-voltmeter-and-ammeter.php
- www.jetir.org
- www.digitalelectronicsforstudents.files.wordpress.com
- www.mist.ac.in
- www.educompjre.files.wordpress.com

IFTM UNIVERSITY, MORADABAD
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Diploma (CSE) - I Year (II Semester)
(w.e.f. session 2022 – 2023)
DPPH 201: ELEMENTARY PHYSICS-II

Objective: The objective of this course is to provide an understanding of optics, electrostatics and semiconductors etc.

UNIT-I (08 Sessions)
 Waves and Vibrations: Introduction, Types of wave motion with examples, Relation between velocity of wave, frequency and wave length of a wave ($v = \eta\lambda$), Simple harmonic motion: definition, expression for displacement, Velocity, acceleration, time period, frequency in S.H.M., Vibration of spring mass system, Free, forced and resonant vibrations with examples.

UNIT-II (08 Sessions)
 Optics :Concept of mirrors, lenses, reflection & refraction of light, refractive index, lens formula (no derivation), real and virtual image, magnification, Power of lens, Simple and compound microscope, magnifying power and its calculation (in each case) , Total internal reflection

UNIT-III (10 Sessions)
 Electrostatics: Coulomb’s law, Gauss’s Law, Electric field intensity and electric potential, Electric field of point charge, charged sphere, Capacitance, types of capacitors, capacitance of parallel plate capacitor, series and parallel combination of capacitors, Dielectric and dielectric constant.

UNIT-IV (10 Sessions)
 Current Electricity :Ohm’s law, Resistance of a conductor, specific resistance, Series and Parallel, Combination of resistors, effect of temperature on resistance, Kirchhoff’s laws, Wheatstone bridge principle and its applications, Heating effect of current and concept of electric power.

UNIT-V (08 Sessions)
 Semi Conductor Physics:Energy bands, Intrinsic and Extrinsic semi conductor, p-n junction diode and its characteristics, Diode as rectifier-half wave and full wave rectifier.

Course Outcomes:

Students completing this course will be able to:

CO1: Differentiate between wave and vibrations.

CO2: Understand mirror, lens, phenomenon of reflection and refraction, working and principle of Simple Microscope and compound microscope.

CO3: Explain Coulomb’s law, Gauss Law and their applications.

CO4: Apply Ohms law to solve problems.

CO5: Understand semiconductors and characteristics of diodes.

PO-CO Mapping (Please write 3,2,1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	2	3	1	2	2	2	3
CO 2	3	2	1	2	1	2	3	3
CO 3	3	2	1	2	3	1	1	3
CO 4	3	2	3	1	2	2	2	3
CO 5	3	2	1	2	3	3	2	1

Suggested Readings:

1. Concept of Physics Prof. H.C. Verma, Part-1 (BhartiBhawan)
2. Concept of Physics, Prof. H.C. Verma, Part-2 (BhartiBhawan)
3. A Text Book of Applied Physics: Eagle Parkashan, Jullandhar

Website sources:

- <https://courses.lumenlearning.com>
- <https://en.wikipedia.org>
- <https://cnx.org>
- <http://www.sakshieducation.com>
- <https://www.toppr.com>
- <https://opentextbc.ca>
- <https://www.askiitians.com/>
- <https://www.askiitians.com>

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - I Year (II Semester)
(w.e.f. session 2022 – 2023)
DPMA 201: ELEMENTARY MATHEMATICS-II

Objective: - The course is aimed to develop the basic Mathematical skills of diploma engineering students that are imperative for effective understanding of engineering subjects. To understand basics and applications of differential & integral Calculus and coordinate geometry.

UNIT I **(08 Sessions)**
DIFFERENTIAL CALCULUS-I: Functions, Limits, Continuity, Functions and their graphs, Range and domain, Elementary methods of finding limits (right and left), Elementary test for continuity and differentiability. Methods of finding derivative, Function of a function, Logarithmic differentiation, Differentiation of implicit functions.

UNIT II **(08 Sessions)**
Higher order derivatives, Leibnitz’s theorem. Special functions (Exponential, Logarithmic, Hyperbolic, Inverse and circular function), Definition, Graphs, Range and Domain and Derivations of each of these functions.

UNIT III **(08 Sessions)**
Application - Finding Tangents, Normal, Points of maxima and minima, Increasing and Decreasing functions, Sketching of some simple curves (without assumptions, question, not to be asked in the examination), Rate, Measure, Velocity, Acceleration, Errors and approximations.

UNIT IV **(08 Sessions)**
INTEGRAL CALCULUS-I: Methods of indefinite integration:- Integration by substitution, by partial fraction and by parts, Integration of special functions Meaning and properties of definite integrals, Evaluation of definite integrals.

UNIT V **(08 Sessions)**
CO-ORDINATE GEOMETRY: Standard form of curves and their simple properties-Parabola Ellipse, Hyperbola, Tangent and normals, Straight lines, Planes and Spheres in space-distance between two points in space, Direction cosines and direction ratios, Finding equation of a straight line and Shortest distance between two lines under different conditions equation of a plane, Relation between lines and Planes, Sphere.

Course Outcomes:

- CO1: Basic Knowledge of function, limit and derivatives.
- CO2: Apply differential calculus and higher order to solve engineering problems.
- CO3: Find velocity, acceleration, errors and approximation in engineering problems with application of derivatives.
- CO4: Calculate simple integration by methods of integration and evaluate the area under curves, surface by using definite integrals.
- CO5: Understand the geometric shapes used in engineering problems by co-ordinate geometry.

PO-CO Mapping (Please write 3,2,1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	3	1	1	3
CO2	3	2	3	1	2	2	2	3
CO3	3	2	1	2	3	3	2	1
CO4	3	2	3	1	2	2	2	3

CO5	3	2	1	2	1	2	3	3
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Suggested Readings:

1. R.D. Sharma: Mathematics (I& II-XI) [DhanpatRai Publication, Delhi.]
2. B.S. Grewal :Engg. Mathematics by [khanna Publishers, New Delhi.]
3. H.R. Luthra : Applied Mathematics:[Bharat BhartiPrakashan& Co. Meerut]
4. KailashSinha : Applied Mathematics: [Nav Bharat Publication, Meerut]
5. NCERT (XI & XII)

Website Sources:

- www.pdfdrive.com
- www.dmi.gov.in
- www.yourarticlelibrary.com
- onlinecourses.nptel.ac.in
- en.wikipedia.org

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - I Year (II Semester)
(w.e.f. session 2022 – 2023)
DPCH 201: ELEMENTARY CHEMISTRY-II

Objectives: To emphasize the relevance of fundamentals and applications of chemistry for diploma holders and student will learn appropriate combinations of old and new emerging concepts. Also to bring potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

UNIT I **(08 Sessions)**

Lubricants: Definition, classification, Necessity and various kinds of lubricants. Function and mechanism of action of lubricants with examples. Properties of lubricants, Importance of additive compounds in lubricants, Synthetic lubricants and cutting fluids.

UNIT II **(08 Sessions)**

Fuels and Environmental Pollution: Definition of fuel, its classification and their composition, Knocking, Anti-knocking agents, Octane number and Cetane number. Cracking and its type, Gaseous Fuel - Water gas, Bio gas, LPG, CNG and solar energy.

Concept and various types of environmental pollution, air pollution and water pollution. General measures to control environmental pollution. Depletion of Ozone layer, Green house effect, Acid rain, Smog formation.

UNIT III **(08 Sessions)**

Water Treatment and Corrosion: Concept of hard and soft water, Hardness of water, Softening method (Only Ion exchange resin process). Disadvantages of hard water in different industries, Boiler feed water.

Corrosion- Concept of metallic corrosion, factors affecting the corrosion rate, Prevention of corrosion by various methods.

UNIT IV **(08 Sessions)**

Glass and Ceramics: Concept of glass and its constituents, Classification and uses of different glass, Elementary idea of manufacturing process of glass.

UNIT V **(08 Sessions)**

Organic Chemistry:

Isomerism- Types of isomerism

1. Structural isomerism
2. Stereoisomerism (a) Geometrical (b) Optical
 - A. Electrophiles and nucleophiles
 - B. Reaction Intermediates
 - i. Free radical
 - ii. Carbocation
 - iii. Carbanion

Polymers:

1. Basic terms used in polymer chemistry and Polymerisation.
2. Characteristics of Polymers and their classification

Course Outcomes:

CO1: Understand the classification, properties and importance of lubricants.

CO2: Learn about the various fuels, their classification and pollution to the environment

CO3: Learn about the treatment of water and basic concept of metallic corrosion.

CO4: Understand the concept, classification and uses of glass and ceramics.

CO5: Describe basic concepts of organic chemistry and polymerization.

PO-CO Mapping (Please write 3,2,1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	3	3	1	2	2	2	2
CO2	3	2	3	2	1	2	3	2
CO3	2	2	1	2	3	1	3	3
CO4	3	2	3	3	3	3	2	1
CO5	3	2	3	1	2	2	2	2

Suggested Readings:

1. Liquid Crystals and Plastic Crystals, vol.-I, edited by G.W. Gray and P.A. Winsor, Ellis Harwood Engineering Chemistry by J C Kuriacose and J. Rajaram, Tata McGraw-Hill Co, New Delhi (2004)
2. Chemistry of Engineering Materials by C.P. Murthy, C.V. Agarwal and A. Naidu BS Publication Hyd.

Website Sources:

- <http://www.commonchemistry.org/>
- <https://uri.idm.oclc.org/login?url=https://www.engineeringvillage.com/search/quick.url?CID=quickSearch&database=1>
- <https://www.technicalsymposium.com/>

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - I Year (II Semester)
(w.e.f. session 2022 – 2023)
DPME 203: ELEMENTARY MECHANICAL ENGINEERING

Objective:

To provide a comprehensive knowledge of basic mechanical systems, basic concepts from mechanical engineering sciences. Modern engineering tools (machine-tools) and related subjects to design mechanical engineering components.

UNIT I

(08 Sessions)

Thermal Engineering: A. SOURCES OF ENERGY; Basic ideas, conventional and nonconventional forms- Thermal, Hydel, Tidal, wind, Solar, Biomass and Nuclear and their uses. B. FUELS & COMBUSTION; Introduction to common fuels - solid, liquid and gases and their composition. Combustion of fuels- their higher and lower calorific values. Combustion equations for carbon, sulphur, hydrogen and their simple compounds. Calculation of minimum amount of air required for complete combustion. Combustion analysis on mass basis and on volume basis. Concept of excess air in a boiler furnace combustion. Heat carried away by flue gases. Analysis of flue gases by Orsat apparatus. Simple numerical problems Idea of specific properties of liquid fuels such as detonation, knock resistance (cetane and octane numbers), viscosity, solidification point, flash point and flame point.

UNIT II

(08 Sessions)

MACHINE COMPONENTS: Brief Idea of loading on machine components. (i) Pins, Cotter and Knuckle Joints. (ii) Keys, Key ways and spline on the shaft. (iii) Shafts, Collars, Cranks, Eccentrics. (vi) Couplings and Clutches. (v) Bearings-Plane, Bushed, Split-step, ball, Roller bearing, Journal bearing, Foot step bearing, thrust bearing, collar bearing and Special type bearings and their applications. Selection of ball bearing and roller bearing for given application using design data book.

UNIT III

(08 Sessions)

(i) Gears : Different types of gears, gear trains and their use for transmission of motion. Determination of velocity ratio for spur gear trains; spur gear, single and double helical gears, Bevel gears, Mitre wheel, worms, Rack and Pinion. Simple and compound and epicyclic gear trains and their use. Definition of pitch and pitch circle & module. (ii) Springs: Compression, Tension, Helical springs, Torsion springs, Leaf and Laminated springs. Their use and material. Selection of spring by design data book, simple numerical problem.

UNIT IV

(08 Sessions)

MECHANISMS: Definition of link, Frame and mechanism. Difference between machine and mechanism, kinematic pairs, lower and higher pairs. Velocity diagram for four bar mechanism, slider crank mechanism, quick return mechanism. Introduction to Cam and its use.

UNIT V

(08 sessions)

LUBRICATION: Different lubrication system for lubricating the components of machines. Principle of working of wet sump and dry sump system of lubrication. (Explained with simple line diagram). Selection of lubricant based on different application (Requirement with the help of manufacturer catalogue).

Course Outcomes:

Students completing this course will be able to:

CO1: To understand various energy resources and energy systems available to produce power.

CO2: To understand about different mechanical components with their applications.

CO3: To make the student conversant with commonly used mechanism for industrial application.

CO4: To understand basic principle, related terms and apply principles of gear design.

CO5: To understand about lubrication systems and its importance.

PO-CO Mapping (Please write 3,2,1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	3	3	1	2	2	1	3
CO2	3	2	2	2	3	3	2	2
CO3	2	3	3	2	2	1	1	3
CO4	3	2	3	1	2	2	2	3
CO5	2	3	2	2	2	2	2	1

Suggested Reading:

1. Elements of Mechanical Engineering by J.K.Kapoor (Bharat BhartiPrakashan).
2. Elements of Mechanical Engineering by R.P.Garg, BBP Pub. Pvt. Ltd, Meerut.

Website Sources:

- www.onlinecourses.nptel.ac.in
- <https://khannapublishers.in/index.php?route=product/category&path>

IFTM UNIVERSITY, MORADABAD
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Diploma (CSE) - I Year (II Semester)
(w.e.f. session 2022 – 2023)
DPPH 251: PHYSICS-II LAB

Objective: This course aim is to give exposure to the students about the experiments so that students will get a better understanding of the concepts studied by them in the theory course and can correlate with experimental observations.

LIST OF EXPERIMENTS

(20 Sessions)

1. To determine and verify the time period of cantilever by drawing graph between load and depression.
2. To determine the magnifying power of a compound microscope
3. To determine the magnifying power of an astronomical telescope
4. To verify Ohm's law
5. To verify law of resistances in series
6. To verify law of resistances in parallel
7. To convert a galvanometer into an ammeter of given range
8. To convert a galvanometer into a voltmeter of a given range

Course Outcomes:

Students completing this course will be able to:

CO1: Evaluate time period of cantilever

CO2: Determine magnifying power

CO3: Verify law of resistances

CO4: Apply the mathematical concepts/equations to obtain quantitative results.

CO5: Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results.

Suggested Readings:

1. Concept of Physics Prof. H.C. Verma, Part-1 (Bharti Bhawan)
2. Concept of Physics, Prof. H.C. Verma, Part-2 (Bharti Bhawan)
3. A Text Book of Applied Physics: Eagle Prakashan, Jullandhar

Website sources:

- <https://www.learnbse.in>
- <http://notesforfree.com>
- <https://www.cmi.ac.in>
- <http://amrita.olabs.edu.in>
- <http://sisphysics.weebly.com>

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - I Year (II Semester)
(w.e.f. session 2022 – 2023)
DPCH 251: CHEMISTRY-II LAB

(20 Sessions)

Objectives: Practical implementation of fundamental concepts of qualitative and quantitative analysis. Student will gain the knowledge on existing future upcoming devices, materials and methodology used in chemistry practical. They will rely on elementary treatment and qualitative analysis. These practicals will provide an overview of quantitative analysis.

List of Experiments

1. Determination of pH of Common Substances.
2. Measurement of soil suspension pH (1:5 or 1:2).
3. Preparation of Soap.
4. Determination of the Strength of Ferrous Sulphate using Standard Ferrous Ammonium sulphate and Potassium Dichromate as Intermediate Solution.
5. Looking at Acid's Effects on Metals.
6. Paper Chromatography of dyes.
7. Determination of the Strength of Copper Sulphate Solution using a Standard Solution of sodium thiosulphate solution.
8. Extract synthetic coloring agents in food products and identify them by paper chromatography.
9. To determine the pH level of both city water and well water to determine which is more basic and which is more acidic.
10. Determination of temporary and permanent hardness of water sample.

Course Outcome:

CO1: Understand about the standard solution, carrying out simple qualitative tests and of defining the optimal conditions for a reaction to proceed.

CO2: Volumetric quantitative determinations, preparations and standard analysis procedures.

Suggested Readings:

1. Applied Chemistry by R. S. Katiyar & J.P. Chaudhary Publication B.B.P. & Co. Meerut
2. March's Advanced Organic Chemistry: Reactions, Mechanisms and Structure Smith, Michael B./March, Jerry, John Wiley & sons, 6th Edition, 2007.
3. Elements of Physical Chemistry, Glasstone, Samuel B. ELBS, 2005.
4. Organic Chemistry, Finar, I.L.: Addison – Wesley Longman, Limited, 2004.
5. Principles of Physical Chemistry, by Puri B.R., Sharma L.R., S. Nagin & Company, Delhi

Website Sources:

- <https://www.gopracticals.com/basic-engineering/>
- <https://edu.rsc.org/resources/practical>
- <https://play.google.com/store/apps/details?id=com.softwareindiavinod.chemistrypracticals&hl=en&gl=US>

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - II Year (III Semester)
(w.e.f. session 2022 – 2023)
DPCS 301: BASIC DIGITAL ELECTRONICS

Objective: The objective of this course is that students will learn and understand the Basics of digital electronics and able to learn the basics of gates and design basic logic circuits, combinational and sequential circuits.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I (10 Sessions)
Data and number systems, Binary representation, codes and their conversions: BCD, Octal, Hexadecimal, Gray, Signed binary number representation with 1's and 2's complement methods.

UNIT II (10 Sessions)
Binary arithmetic Boolean algebra, logic gates and circuits, Minimization of logic expressions by algebraic method, K-map method.

UNIT III (09 Sessions)
Combinational circuits: adder, subtractor, encoder, decoder, comparator, multiplexer, de-multiplexer, parity generator, Design of combinational circuits-Programming logic devices.

UNIT IV (08 Sessions)
Flip Flops, various types of Registers and counters and their design, sequential circuits.

UNIT V (07 Sessions)
Memory devices: ROM, RAM, EPROM, EEPROM, etc Different types of A/D and D/A conversion techniques.

COURSE OUTCOMES (CO):
On the completion of this course students will be able to understand:

	DESCRIPTION
CO1	Learn number system and their conversion.
CO2	Design and learn the basics of gates and simple logic circuits.
CO3	To understand the basic combinational circuits and to verify their operation.
CO4	Design and learn sequential circuits and various registers.
CO5	Learn about different types of memory devices.

PO-CO Mapping (Please write 3, 2, 1 wherever required)
(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	1	3	2	1	1	2	3	1
CO2	2	2	1	2	2	1	2	1
CO3	3	2	1	1	1	2	2	2
CO4	2	1	2	2	1	1	1	1
CO5	1	2	1	1	2	1	2	2

Suggested Readings:

1. Givone: digital Principles & design, TMH
2. Digital Electronics – Dr. Saroj Rangnekar, ISTE/EXCEL BOOKS
3. Malvino: Digital Principles & application TMH
4. Jain: Modern Digital Electronics 2/e TMH
5. Marcovitz: Intro to logic Design Tata Mcgraw-hill
6. Digital Integrated Electronics- H.Taub&D.Shilling, Mc Graw Hill
7. Digital Technology- Virendra Kumar, New Age

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- electronics-course.com
- www.coursera.org
- www.electronics-tutorials.ws

IFTM UNIVERSITY, MORADABAD
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Diploma (CSE) - II Year (III Semester)
(w.e.f. session 2022 – 2023)

DPCS 302: INTRODUCTION TO DATA STRUCTURE AND ALGORITHM

Objective: The objective of this course is to introduce the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I

(10 Sessions)

Introduction: Basic Terminology, Elementary Data Organization, Data Structure operation, Algorithm, Complexity of Algorithm, Abstract Data Type

Arrays: Introduction, Linear Arrays, Representation of array in memory, Insertion and Deletion in array, Multidimensional Arrays

Linked lists: Introduction, Representing of Linked Lists in Memory, Implementation of Singly Linked Lists, Doubly Linked List.

UNIT II

(10 Sessions)

Stacks: Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack, Application of stack.

Queues: Representation of Queue, Operations on Queue: Create, Add, Delete, Full and Empty, Linked representation of queues, Circular queues, Dequeue

UNIT III

(07 Sessions)

Tree: Definitions and Basic Concepts of Binary Tree, Representations of binary tree in memory, Binary Tree Traversal algorithms and their Applications.

UNIT IV

(08 Sessions)

Graphs: Terminology, Sequential and Linked Representations of Graphs: Adjacency Matrices, Adjacency List, Graph Traversal: Depth First Search and Breadth First Search.

UNIT V

(07 Sessions)

Sorting: Introduction, Sorting, Insertion Sort, Selection Sort, Merge Sort, Bubble Sort.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To learn and understand the basic features of data structure, Array and Linked list.
CO2	Describe how stacks and queues are represented in memory and other features of these two data structures.
CO3	Demonstrate different example and use of trees.
CO4	Demonstrate different example and use of Graphs.
CO5	An understanding of the basic sorting algorithms.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	1	2	1	3	1	2
CO2	1	2	1	1	2	1	2	1
CO3	3	2	1	2	3	3	1	2
CO4	2	1	2	1	2	2	1	3
CO5	2	3	1	2	2	1	2	1

Suggested Readings:

1. Schaum's Outlines Data structure Seymour Lipschutz Tata McGraw Hill 2nd Edition
2. Data structures & Program Design in C Robert Kruse, C.L.Tondo, Bruce Leung Pearson
3. Data structure using C AM Tanenbaum, Y Langsam& MJ Augustein, Prentice Hall India
4. Data structure – A Pseudocode Approach with C – Richard F Gilberg Behrouz A. Forouzan, Thomson

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.tutorialspoint.com/data_structures_algorithms/
- www.studytonight.com
- www.geeksforgeeks.org

IFTM UNIVERSITY, MORADABAD
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(w.e.f. session 2022 – 2023)

DPCS 303: BASIC OBJECT ORIENTED CONCEPTS & C++

Objective: The objective of this course is to provide complete knowledge of Object-Oriented programming concepts and their implementation and to enhance the programming skills by giving practical assignments to be done in labs.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(10 Sessions)**

Introduction: C++ character set, Keywords, Input-Output operator, Role of compiler, Data types, Variables & Constants, Local & global variables. Operators: Arithmetic, Unary, Binary, Increment & Decrement, Logical. Jump statements: Goto, Break, Continue, and Exit.

UNIT II **(10 Sessions)**

Conditional Statements: If-else, Nested if, Else-if, Switch-case. Iteration statements: For loop, While loop, Do-while loop. Arrays: Definition, Need of arrays, Initialization, Implementation. Functions: Definition, Use, Prototype, Call by value, Call by reference, Return statement.

UNIT III **(06 Sessions)**

Pointers: Definition, Memory allocation, Declaration, Application. Structures: Definition, Uses, Declaration, Advantages and Disadvantages.

UNIT IV **(08 Sessions)**

Concept of Object oriented programming: Data Abstraction, Data Hiding, Data Encapsulation, Class & Object, Abstract Class, Polymorphism, Inheritance, and Advantages of OOP over earlier programming methodologies.

UNIT V **(08 Sessions)**

Inheritance: Concept, Base Class, Derived Class, Defining derived class, Types: Single, Multiple, Multilevel, Members, Accessibility of members, Mode of Inheritance.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understand the basic features of C++.
CO2	Explain and apply fundamental syntax for different types of statements, array and functions.
CO3	Understand dynamic memory management techniques using pointers, constructors, destructors, etc
CO4	Learn Object-Oriented concepts and their implementation.
CO5	Understand and implement different types of inheritance available in C++.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	1	2	1	2
CO2	2	1	2	3	2	2	2	1
CO3	3	2	2	3	2	1	1	2
CO4	1	2	2	1	1	2	1	2
CO5	3	2	1	2	2	2	1	2

Suggested Readings:

1. Sumita Arora, "Computer Science using C++", Dhanpat Rai & Co.
2. Yashwant Kanitker, "Let us C++".
3. E. Balaguruswami, "ANSI C++".

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.includehelp.com
- www.cplusplus.com
- beginnersbook.com

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(w.e.f. session 2022 – 2023)

DPCS 304: COMPUTER APPLICATION SOFTWARE PACKAGES

Objective: The objective of this course is that students will learn and understand the basic features of Microsoft Office, Windows basics, and file management. Develop the knowledge with Word, Excel, Access, PowerPoint, email, and Internet basics.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I

(10 Sessions)

Ms Word Processing:

File: Open, Close, Save and Find File, Print and Page Setup

Edit: Cut, Copy, Find, Replace

Insert: Page Insert, Page No., Symbol

Font: Paragraph, Tabs, Border & Shading, Change Case

Tools: Spelling, Mail Merge

Table: Insert Table, Delete Cells, Merge Cell, Sort Text

UNIT II

(10 Sessions)

MS Excel:

File: Open, Close, Save and Find File, Print and Page Setup

Edit: Cut, Copy, Find, Replace, Undo, Redo

Insert: Cell, Row, Worksheet, Chart

Format: Data, Sort, Filter, Form, Table

UNIT III

(08 Sessions)

Power Point:

File: New, Open, Close, Save as HTML, Pack and Go, Page setup, Send to, Properties

Edit: Cut, Copy, Find, Replace, Undo, Redo, Duplicate.

View: Slide Outline, Slide sorter, Note page, Slide show, Master, Black & white slide, Toolbars, Ruler, Guides.

Insert: New slide, Duplicate slide, Picture, Text box, Movies & sound, Hyperlink.

Format: Font, Bullet, Alignment, Line spacing, Slide layout.

Tool: Power point, Presentation & conference, Expand slide, Macro, customize.

Slide show: View show, Rehearse timing, Narration, View on two screens, Active buttons, Preset

Animation, Custom: animation, Slide transition.

Window: New window, Arrange icons, Fit to page, Cascade.

UNIT IV

(07 Sessions)

Electronic Mail:

Composing an Email Message

Automatically add contents to Your Address Book

Reading a message

Checking for New Messages

Reading files Attachment

Taking Acting on a Message

Advantage of using Web Based Email

UNIT V

(07 Sessions)

Electronic Commerce: Overview, Definitions, Advantages and Disadvantages of E-commerce, Introduction to Cyber Laws

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Gain the knowledge about MS Word
CO2	Understanding about MS Excel
CO3	Learn how to work with MS Power Point
CO4	Understanding about Electronic Mail
CO5	Recognize and discuss about E commerce

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	3	2	1	2	2	3
CO2	3	2	1	2	3	2	1	2
CO3	2	3	1	2	3	2	1	2
CO4	2	1	2	3	2	1	2	1
CO5	2	1	2	3	2	1	2	2

Suggested Readings:

1. Microsoft Office 2010 For Dummies By Wallace Wang
2. 2007 Microsoft Office System Plain & Simple by Jerry Joyce- Microsoft Press
3. Office XP : The Complete Reference- Stephen L. Selson - Tata McGraw Hill Education.
4. Working in Microsoft Office - Richard Mansfield - Tata McGraw Hill Education.

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.coursera.org
- www.goskills.com/Course/Microsoft-Word-Basic
- https://www.tutorialspoint.com/e_commerce/

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - II Year (III Semester)
 (w.e.f. session 2022 – 2023)
DPCS 305: Organizational Behavior

Objective: To study about Organizational Behavior; their nature and scope, about the basic foundation for an Individual behavior, the fundamentals of Group behaviors, and about various foundations in an organization along with their changes and development.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(06 Sessions)**

Organizational Behaviors: Introduction to Organizational Behaviors, Its Nature & Scope.

UNIT II **(09 Sessions)**

Foundations of Individual Behaviors: Personality, Perception, Learning, Values, Attitudes and Job Satisfaction, Ability and Motivation.

UNIT III **(07 Sessions)**

Group: Foundations of Group Behaviors: Communication and Group Decision Making; Leadership: Power and Politics, Conflict.

UNIT IV **(07 Sessions)**

Organization: Foundations of Organization Structure: Job Design, Work Settings and Job Stress; Organizational Culture: Meaning, Importance and Characteristics of Organization Culture.

UNIT V **(11 Sessions)**

Organization Change and Development: Significance of Change; Forces of Change: Resistance to Organizational Change; Management of Change Organization Development: Concept, Characteristics and Assumptions; Goals, Approaches and Techniques of Organization Development.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Learn about Organizational Behavior
CO2	Understanding of Individual behaviour
CO3	To learn about group behaviour
CO4	Study about foundation of organization structure
CO5	Understand about Organization change and its development

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	1	2	1	3	2	1
CO2	3	2	1	2	2	1	3	2
CO3	1	2	3	2	1	2	1	2
CO4	3	2	2	1	2	2	1	2
CO5	2	1	2	1	2	3	2	1

Suggested Readings:

1. Stephen P. Robbins “Organizational Behavior” 10th Edition.
2. Debra L. Nelson “Organizational Behavior” 2009 Edition.
3. Ankur Chhabra “Organizational Behavior” Sun India Publication.

Website Sources:

- <https://nptel.ac.in/courses/110/105/110105033/>
- https://www.tutorialspoint.com/organizational_behavior/organizational_behavior_introduction.htm
- <https://www.slideshare.net/YaminiKahaliya/organisation-behavior-introduction-of-organisation-behavior-for-bbabcom-students>

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(w.e.f. session 2022 – 2023)
DPCS 351: DIGITAL ELECTRONICS LAB

Objective: This laboratory will enable the students to learn and implement the basic concepts and techniques in digital electronic circuits and systems.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. Introduction to Digital Laboratory Equipments & IC's
2. To study basic gates and verify their truth tables.
3. Bread Board implementation of adder.
4. Bread Board Implementation of subtractor.
5. Write a C program to Verify the Truth Table of Logic Gates.
6. Write a C program to Verify the Truth Table of Universal Logic Gates.
7. To design and verify operation of half adder and full adder.
8. To design and implement encoder and decoder
9. To Study of Binary to Grey Code Converter
10. To design and construct basic flip flops

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Learn the basics of gates.
CO2	Construct basic combinational circuits and verify their functionalities.
CO3	Identify the various digital ICs and understand their operation.
CO4	To understand and implement the basic digital circuits and to verify their operation.
CO5	To understand to conversations of different number system

Suggested Readings:

1. Givone: digital Principles & design, TMH
2. Digital Electronics – Dr. Saroj Rangnekar, ISTE/EXCEL BOOKS
3. Malvino: Digital Principles & application TMH
4. Jain: Modern Digital Electronics 2/e TMH
5. Marcovitz: Intro to logic Design Tata Mcgraw-hill
6. Digital Integrated Electronics- H.Taub&D.Shilling, Mc Graw Hill
7. Digital Technology- Virendra Kumar, New Age

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- electronics-course.com
- www.coursera.org
- www.electronics-tutorials.ws

IFTM UNIVERSITY, MORADABAD
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Diploma (CSE) - II Year (III Semester)
 (w.e.f. session 2022 – 2023)
DPCS 352: DATA STRUCTURE LAB

Objective: Understanding the importance of data structures, abstract data type, and their basic usability in a different application, implementing linear and non-linear data structures using linked lists and arrays.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. Develop a Program to:
 - a) Insert the element in an array
 - b) Delete an element from an array
 - c) Reverse an array
 - d) Display the array
2. Implementation of Stack using array.
3. Write a program in C language to implement Linear Queue.
4. Write a program in C language to implement Circular Queue.
5. Write a program in C to perform the following operations in a Linear Linked List:
 - a) Create
 - b) Display
 - c) Exit
6. Write a program in C for various operations on Doubly Linked List.
7. Write a program in C for Binary Traversal Algorithm.
8. Write a program in C for Selection Sort.
9. Write a program in C for Insertion Sort.
10. Write a program in C for Bubble Sort.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Construct Linear and nonlinear data structures using arrays and linked list
CO2	Choose appropriate data structure to solve various computing problems.
CO3	Identify suitable data structure and algorithm to solve a real world problem.
CO4	To understand the sorting and searching.
CO5	To understand the different operations on data structures.

Suggested Readings:

1. Schaum's Outlines Data structure Seymour Lipschutz Tata McGraw Hill 2nd Edition
2. Data structures & Program Design in C Robert Kruse, C.L.Tondo, Bruce Leung Pearson
3. Data structure using C AM Tanenbaum, Y Langsam & MJ Augustein, Prentice Hall India
4. Data structure – A Pseudocode Approach with C – Richard F Gilberg Behrouz A. Forouzan, Thomson

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.tutorialspoint.com/data_structures_algorithms/
- www.studytonight.com
- www.geeksforgeeks.org

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 (w.e.f. session 2022 – 2023)
DPCS 353: C++ LAB

Objective: This laboratory will help to students to identify and practice the object-oriented programming concepts and techniques, practice the use of C++ classes and class libraries, arrays, inheritance and file I/O stream concepts.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. Program in C++ to calculate the area of a circle, rectangle and triangle.
2. Program in C++ to print factorial of a given number.
3. Program in C++ to input marks in 5 subjects & calculate aggregate & percentage.
4. Program in C++ to find out whether the given number is odd or even
5. Program in C++ to find out whether the given year is a leap year or not
6. Program in C++ to find out the maximum out of three numbers
7. Program in C++ to generated Fibonacci series 0,1,1,2,3,5,8,13,...n
8. Program in C++ for swapping of two numbers with & without using 3rd variable.
9. Program in C++ to display series and find sum of 1+3+5+.....+n.
10. Program in C++ to implement single inheritance.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To learn and understand the basic concepts and their implementation.
CO2	Creating simple programs using classes and objects in C++.
CO3	Implement Object Oriented Programming Concepts in C++.
CO4	An ability to design object-oriented programs with specified functionality.
CO5	To understand the experimental concept of objects and classes.

Suggested Readings:

1. Sumita Arora, “Computer Science using C++“, Dhanpat Rai & Co.
2. Yashwant Kanitker, “Let us C++”.
3. E. Balaguruswami, “ANSI C++”.

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org

- www.includehelp.com
- www.cplusplus.com
- beginnersbook.com

IFTM UNIVERSITY, MORADABAD
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DPCS 354 COMPUTER APPLICATION SOFTWARE PACKAGES LAB

Objective: This laboratory will help to students to learn and understand the basic features of Microsoft Office, Windows basics, and file management. Develop the knowledge with Word, Excel, Access, PowerPoint.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

Microsoft Word:

1. Creating a document using different font, changing font size and color, changing the appearance through bold/italic/underline.
2. Creating a document using subscript and superscript, justification, Bullets and Numbering of the document.
3. Create a document using page number, header and footer and inserting page breaks and column break, line spacing.
4. Creating table, formatting cells, use of different border styles, shading in tables, merging of cells, and partition of cells, inserting and deleting a row in a table in MS word document.
5. Apply spelling checker, grammar mistakes, thesaurus in a document and set the page setup and print preview, and then print that document.

Microsoft Excel:

6. Working on spreadsheet like adding, deleting, merging cells, layout and style.
7. Create a table and perform operation using predefined function on it.
8. In MS Excel procedure to switching between different spreadsheets and workbook.
9. Create a spreadsheet and print selected as well as full workbook.
10. Create different charts in excel and implement formulas (automatic and use defined).

Microsoft Power Point:

11. Create, Save, Run and Print the Power Point Presentation.
12. Create a Power Point presentation using animation and transition.
13. Create a Power Point Presentation with Adding tables and chart etc.
14. Changing slide color scheme in presentation.
15. Create and share Google sheets.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Use Microsoft Office programs to create personal, academic and business documents.
CO2	Identify and use E-mail features.
CO3	Create and edit basic Excel spreadsheets.
CO4	Create and edit basic PowerPoint presentations.
CO5	Create and edit basic Word documents.

Suggested Readings:

1. Microsoft Office 2010 For Dummies By Wallace Wang
2. 2007 Microsoft Office System Plain & Simple by Jerry Joyce- Microsoft Press
3. Office XP : The Complete Reference- Stephen L. Selson - Tata McGraw Hill Education.
4. Working in Microsoft Office - Richard Mansfield - Tata McGraw Hill Education.

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.coursera.org
- www.goskills.com/Course/Microsoft-Word-Basic
- https://www.tutorialspoint.com/e_commerce/

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(w.e.f. session 2022 – 2023)

DPCS 401: INTRODUCTION TO COMPUTER NETWORK

Objective: The objective of this course is to familiarize the student with the basic arrangement and terminology of the computer network area. And also build an understanding of the fundamental concepts of computer networking.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(08 Sessions)**

Introduction: Goal and Application of Network, Network Structure and architecture, Network Topology, Terminal Handling.

UNIT II **(10 Sessions)**

Transmission Media: Twisted pair, Coaxial Cable, Optical Fibers, Wireless Transmission, Microwave, Radio Waves, and Infrared.

UNIT III **(08 Sessions)**

Protocols and Architecture: Protocols, OSI reference models, TCP/IP protocol suit. Routers, Routing Algorithms, Congestion control algorithm, Addressing, Internet working.

UNIT IV **(08 Sessions)**

Data Link Control and Protocol: Flow Control - Stop and Wait, Sliding window, Error Detection, Error Control, HDLC. Transport Protocol: Transport services, TCP, UDP, Remote Procedure Call.

UNIT V **(10 Sessions)**

Local Area Network: LAN architecture, LAN topologies - BUS/Tree LAN, Ring LAN, Star LAN, Wireless LAN, Ethernet and Fast Ethernet (CSMA/CD), Circuit switching, Packet switching, Frame relay, ATM, ISDN

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understand the basic structure and topology of Computer Network.
CO2	Understand basic transmission media.
CO3	Understand the protocols and architecture of Computer Network.
CO4	Familiarize with Data link control and protocols.
CO5	Gain familiarity with Local Area Network.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	2	3	2	1
CO2	2	3	2	1	2	2	1	2
CO3	2	1	2	3	2	1	2	3
CO4	2	1	2	3	2	1	2	2
CO5	2	3	3	2	1	2	3	2

Suggested Readings:

1. Forouzan “Data Communications and Networking” (3rdEd.)TMH
2. Tanenbaum “Computer Networks” (4th Ed.) Pearson Education/PHI
3. W. Stallings, “Data and Computer Communication”, Macmillan Press

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.coursera.org
- www.studytonight.com
- www.geeksforgeeks.org

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DPCS402: INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

Objective: This course is designed to help the students to gain an understanding of Database and its application as well as associated tools and techniques also acquire a good understanding of database systems concepts and to be in a position to use and design databases for different applications.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(09 Sessions)**

Concepts of DBMS: What is data & information, Data items, An overview of database management system, database system Vs file system DBA, Entity, Attributes, Logical and Physical data, Primary and secondary keys, Form of query, Redundancy, data definitions language, DML, Schema and Sub-schema.

UNIT II **(10 Sessions)**

Relational Database Design: Define data model, classify data model, object based logical model, Record based data model, entity, attribute, Relationship, data model, network model, hierarchy model, top down approach, bottom approach of logical database, need of the normalization. Types of normal form function and dependency, properties of relation. Referential integrity, relational algebra.

UNIT III **(05 Sessions)**

File Organisation Techniques: File system for storage Sequential index, Sequential and Random File organization Technique and their relative advantages and disadvantages.

UNIT IV **(08 Sessions)**

Security and Privacy: Integrity, protection, security, concurrency, Concurrency control, Locking Techniques for concurrency control, recovery.

UNIT V **(12 Sessions)**

SQL: Introduction to SQL commands, Type of SQL commands and its Application RDBMS. Characteristics of SQL, advantage of SQL. SQL data type and literals. Types of SQL commands, SQL operators and their procedure.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Learn various data models used in database design, ER modeling concepts.
CO2	Recognize and identify the use of normalization and functional dependency.
CO3	Discuss and understand file organization techniques.
CO4	Understand database concepts, security and privacy, database recovery.
CO5	Understand the use of SQL and its syntax, SQL operators and their procedure

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	3	2	2	3
CO2	2	1	2	3	2	1	2	2
CO3	2	1	2	1	2	3	2	1
CO4	2	3	2	1	2	3	2	1
CO5	2	3	2	1	2	1	2	2

Suggested Readings:

1. Date C J, "An Introduction to Database Systems", Addison Wesley
2. Korth, Silbertz, Sudarshan," Database Concepts", McGraw Hill
3. Elmasri, Navathe, "Fundamentals of Database Systems", Addison Wesley
4. Leon & Leon, "Database Management Systems", Vikas Publishing House
5. Bipin C. Desai, "An Introduction to Database Systems", Gagotia Publications

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.geeksforgeeks.org
- searchsqlserver.techtarget.com
- <https://www.tutorialspoint.com/dbms/index.htm>
- www.mysqltutorial.org

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DPCS 403: Introduction to Operating System

Objective: To study about the basics of an operating system, types of system structures, processes, CPU scheduling, memory management, virtual memory, file system interface and some important case studies.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(08 Sessions)**
Introduction of operating system: Mainframe Systems, Desktop System, Multiprocessor System, Distributed System, Real Time system.

UNIT II **(08 Sessions)**
Computer-System Structures: Computer System Operation, I/O Structure, Storage Structure, Storage Hierarchy.
Operating-System Structures: System Components, Operating-System Services.

UNIT III **(09 Sessions)**
Processes: Process definition, Process concept, Process Scheduling
CPU Scheduling: Scheduling concepts, Scheduling Algorithm-FCFS, SJF, Priority and Round Robin Scheduling.

UNIT IV **(09 Sessions)**
Memory Management: Concept, Swapping, Paging, Segmentation
Virtual Memory: Define Virtual Memory, Demand Paging, Page Replacement.

UNIT V **(09 Sessions)**
File-System Interface: File Concept, Access Methods, Directory Structure, Difference between File and Directory, File-System Structure
Case Study: Different version of Windows, Introduction about Linux, Mobile and MS-DOS operating system

COURSE OUTCOMES (CO):
On the completion of this course students will be able to understand:

	DESCRIPTION
CO1	Understand the basics of an operating system and the types of systems.
CO2	Understand the types of system structure and different services provided by operating system.
CO3	Understand about Processes and CPU scheduling.
CO4	Understand different memory management techniques and virtual memory.
CO5	Understand the concept of file system interface and knowledge about some of the important case studies.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	2	3	2	1	2	2
CO2	2	3	2	1	2	2	3	2
CO3	3	2	1	2	3	2	2	1
CO4	2	3	2	1	2	3	2	1
CO5	2	2	3	2	2	1	2	3

Suggested Readings:

1. Silberschatz, Galvin and Gagne, “Operating Systems Concepts”, Wiley
2. Sibsankar Halder and Alex A Aravind, “Operating Systems”, Pearson Education
3. Harvey M Dietel, “An Introduction to Operating System”, Pearson Education
4. D M Dhamdhare, “Operating Systems: A Concept based Approach”, 2nd Edition, TMH
5. William Stallings, “Operating Systems: Internals and Design Principles”, 6th Edition, Pearson Education.

Website Sources:

- <https://www.geeksforgeeks.org/introduction-of-operating-system-set-1/>
- <https://nptel.ac.in/courses/106/106/106106144/>
- https://www.tutorialspoint.com/operating_system/index.htm

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DPCS 404: JAVA PROGRAMMING

Objective: To study the syntax and semantics of the basic Java language for writing Java programs to use concepts such as variable, conditional and iterative execution methods. Understand the basics of object-oriented programming in Java, including exception handling such as calling, definition methods of class objects, mechanism.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(08 Sessions)**

Introduction: History & Evolution of java, an overview of java, Concept of data types, variables.

UNIT II **(08 Sessions)**

Concept of Classes & object oriented programming (Inheritance, Encapsulation, and polymorphism)

UNIT III **(07 Sessions)**

Array: one dimensional multidimensional array Operators & various Control Statements

UNIT IV **(08 Sessions)**

Packages & Interfaces, Exception Handling, Multiprogramming, I/O in java & applets

UNIT V **(09 Sessions)**

Introduction to JDBC with MS Access and Servers like MS SQL

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To learn and understand about history and overview of java concepts.
CO2	Identify the classes, objects, and members of a class using the principles of OOPs.
CO3	Demonstrates the concept of array and various Control Statements.
CO4	Using exception handling to write Java programs that implement error handling techniques.
CO5	To learn and implement JDBC with MS Access and Servers like MS SQL

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	3	2	1	2	1	2	1
CO2	3	2	1	2	3	2	2	3
CO3	1	2	1	2	3	2	1	2
CO4	3	2	1	2	2	1	2	2
CO5	2	1	2	1	2	3	2	1

Suggested Readings:

1. Naughton, Schildt, "The Complete Reference JAVA2", TMH
2. Pandey, Tiwari, "Object Oriented Programming with JAVA", Acme Learning.
3. Horstmann, "CoreJava", Addison Wesley.

Website Sources:

- <https://www.tutorialspoint.com/java/index.htm>
- <https://www.w3schools.com/java/default.asp>
- <https://beginnersbook.com/java-tutorial-for-beginners-with-examples/>

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DPCS 405: BASICS OF COMPUTER ORGANIZATION

Objective: To study about Digital logic circuits, the different digital components, basic computer organizations and how to program them, and about memory organization. This course will also expose students to the basic architecture of processing, memory and input/output organization in a computer system.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(09 Sessions)**
Digital Logic Circuits: Digital Computer, Logic Gates, Boolean algebra, Map Simplification, Combinational Circuits- Half-Adder, Full Adder, Flip Flops, Sequential Circuits, Data Types, Complements

UNIT II **(10 Sessions)**
Digital Components: IC, Decoders, Multiplexers, Registers, Shift Registers, Memory Unit
Register Transfer And Microoperation: Introduction about Register Transfer, Bus and Memory Transfers, Micro operation

UNIT III **(09 Sessions)**
Basic Computer Organization and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, I/O and Interrupt

UNIT IV **(07 Sessions)**
Programming the basic Computer: Machine Language, Assembly Language, Assembler, Program Loops, Programming Arithmetic and Logic Operations Subroutines, I/O Programming

UNIT V **(07 Sessions)**
CPU: Introduction, General Register Organization, Control Word, Stack Organization, Instruction Format, Addressing Modes
Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware.

COURSE OUTCOMES (CO):
On the completion of this course students will be able to understand:

	DESCRIPTION
CO1	Design and learn the basics of gates and simple logic circuits.
CO2	Discuss different digital components and register.
CO3	Explain about basic computer organizations and Design.
CO4	Learn basic computer programming concepts and design them.
CO5	Describe about CPU, and the entire memory organization: its hierarchy and the types of memory.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	2	2	3	2	1	2
CO2	3	2	1	2	2	3	2	2
CO3	2	1	2	3	2	2	1	2
CO4	2	2	1	2	1	2	1	3
CO5	2	1	2	3	2	1	2	1

Suggested Readings:

1. M. Morris Mano, "Computer System Architecture", Prentice Hall of India, 2001.
2. John.p. Hayes, "Computer Architecture and Organization", Tata McGraw Hill, 1996.
3. V.C.Hamatcher, et al "Computer Organization", Tata McGraw Hill, 1996

Website Sources:

- <https://www.javatpoint.com/computer-organization-and-architecture-tutorial>
- https://www.tutorialspoint.com/computer_logical_organization/index.htm
- <https://nptel.ac.in/courses/106/105/106105163/>
- <https://www.geeksforgeeks.org/computer-organization-basic-computer-instructions/>

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DPCS 451: COMPUTER NETWORK LAB

Objective: To develop an understanding of different components of computer networks, various protocols, modern technologies and their applications.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. Study of different types of Network cables and their use.
2. Study of Cross-wired cable and straight through cable using clamping tool.
3. Study of Network Devices.
4. Study of network IP.
5. Connect the computers in Local Area Network.
6. Study of basic network commands.
7. Network configuration commands.
8. Configure a Network topology using packet tracer software.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Study of Network Devices.
CO2	Recognize the technological trends of Computer Networking.
CO3	Understand fundamental underlying principles of computer networking
CO4	Evaluate the challenges in building networks and solutions to those.
CO5	Understand the network configurations.

Suggested Readings:

1. Forouzan “Data Communications and Networking” (3rdEd.)TMH
2. Tanenbaum “Computer Networks” (4th Ed.) Pearson Education/PHI
3. W. Stallings, “Data and Computer Communication”, Macmillan Press

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.coursera.org
- www.studytonight.com
- www.geeksforgeeks.org

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 (w.e.f. session 2022 – 2023)
DPCS 452: DBMS LAB

Objective: This laboratory will help to students to learn and practice database management systems, with an emphasis on how to create, organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. To implement DDL and DML commands
2. Write SQL queries using aggregate functions (sum, avg, count etc)
3. Write SQL queries using set operations
4. To create view of the tables
5. Write SQL queries using operators

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Design and implement a database schema for a given problem-domain.
CO2	Understand the use of SQL and query a database using DML/DDDL commands.
CO3	Declare and enforce integrity constraints on a database.
CO4	Develop a real database application using a database management system.
CO5	Evaluate a real database application using a database management system.

Suggested Readings:

1. Date C J, “An Introduction to Database Systems”, Addison Wesley
2. Korth, Silbertz, Sudarshan,” Database Concepts”, McGraw Hill
3. Elmasri, Navathe, “Fundamentals of Database Systems”, Addison Wesley
4. Leon & Leon, “Database Management Systems”, Vikas Publishing House
5. Bipin C. Desai, “An Introduction to Database Systems”, Gagotia Publications

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.geeksforgeeks.org
- searchsqlserver.techtarget.com
- <https://www.tutorialspoint.com/dbms/index.htm>
- www.mysqltutorial.org

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DPCS 453: OPERATING SYSTEM LAB

Objective: To study about the basic UNIX Shell and MS-DOS Commands, implement FCFS CPU scheduling algorithm, Round Robin Scheduling algorithm, FIFO page replacement algorithms etc. with the help of C programs. Students will gain practical experience with designing and implementing concepts of operating systems.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. Study of UNIX Shell Commands.
2. Study of MS-DOS Commands.
3. Write a C Program to implement FCFS CPU scheduling algorithms.
4. Write a C Program to implement SJF scheduling algorithms.
5. Write a C Program to implement Priority Scheduling algorithms.
6. Write a C Program to implement Round Robin Scheduling algorithms
7. Write a C Program to implement FIFO Page replacement algorithms.
8. Write a C Program to implement LRU Page replacement algorithms.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Experiment with UNIX commands and shell programming.
CO2	Make FCFS CPU scheduling algorithm and implement in C Program.
CO3	Implement SJF Scheduling algorithm and make a program in C language.
CO4	Build C program for FIFO Page Replacement, LRU Page Replacement, etc
CO5	Understand different DOS commands

Suggested Readings:

1. Silberschatz, Galvin and Gagne, “Operating Systems Concepts”, Wiley
2. Sibsankar Halder and Alex A Aravind, “Operating Systems”, Pearson Education
3. Harvey M Dietel, “An Introduction to Operating System”, Pearson Education
4. D M Dhamdhare, “Operating Systems: A Concept based Approach”, 2nd Edition, TMH
5. William Stallings, “Operating Systems: Internals and Design Principles”, 6th Edition, Pearson Education.

Website Sources:

- <https://www.geeksforgeeks.org/introduction-of-operating-system-set-1/>
- <https://nptel.ac.in/courses/106/106/106106144/>
- https://www.tutorialspoint.com/operating_system/index.htm

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DPCS 454: JAVA PROGRAMMING LAB

Objective: To study about the basic understanding of operations in java and implement them, how to implement object-oriented designs with Java.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. Write a program in JAVA to perform arithmetic operations.
2. Write a program in JAVA to find greatest number among three given numbers.
3. Write a program in JAVA to find sum and average of five marks.
4. Write a program in JAVA to find factorial of a number.
5. Write a program in JAVA to find the sum of two numbers using class and object.
6. Write a program in JAVA to find the area of rectangle using constructor.
7. Write a program in JAVA to find area and volume of a room using inheritance
8. Write a program in JAVA to perform sorting of numbers in ascending order.
9. Write a program in JAVA to manage errors and exceptions.
10. Write a program in JAVA to implement multithreading.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Implement basic operations of JAVA programming.
CO2	Run, and test simple object-oriented Java programs.
CO3	Understand exception handling
CO4	Understand the operations of logical statements
CO5	Understand the concept of threading

Suggested Readings:

1. Naughton, Schildt, “The Complete Reference JAVA2”, TMH
2. Pandey, Tiwari, “Object Oriented Programming with JAVA”, Acme Learning.

Website Sources:

- <https://www.tutorialspoint.com/java/index.htm>
- <https://www.w3resource.com/java-exercises/datetime/index.php>

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PSC 401: PROFESSIONAL COMMUNICATION

Course Objectives: The course aims to:

- Enhance the Employability and Career Skills of students.
- Enable the students to communicate confidently and effectively in everyday life.
- Orient the students towards grooming as a professional.
- Make the students Employability Graduates.
- Develop students' confidence and help them attend interviews successfully.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I

(08 Sessions)

Introduction to Soft Skills- Hard Skills v/s Soft Skills, Conversation Skills, Employability and Career Skills, Strategies to improve skills and knowledge at work.

UNIT II

(08 Sessions)

Self-Introduction- Gathering information, Introducing oneself to the audience, Introducing the topic, Asking and answering questions, Presentation- Practice with audio-visual aids (5 minute).

UNIT III

(08 Sessions)

Introduction to Group Discussion- Participating in group discussions, Understanding group dynamics, brainstorming the topic, Question-answer session, Group Discussion- Do's and Don'ts and Strategies to participate in GD effectively.

UNIT IV

(08 Sessions)

Interview Etiquettes- Dressing and Grooming, Body language, Attending job interviews– telephone/Skype interview - one to one interview & panel interview, Frequently asked Questions related to job interviews.

UNIT V

(08 Sessions)

Groups v/s Teams, Time Management, Stress management, Respecting Social Protocols, Understanding Career Management, Developing a long- term Career Plan.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To learn and understand of Soft Skills techniques.
CO2	Make effective presentations
CO3	Participate confidently in Group Discussions.
CO4	Attend job interviews and be successful in them.
CO5	Develop adequate Soft Skills required for the workplace

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	2	1	2	3	2	1
CO2	3	2	1	2	1	3	1	2
CO3	1	2	2	1	2	3	2	1
CO4	2	3	2	1	2	2	3	2
CO5	2	3	2	1	2	1	2	1

Suggested Readings:

1. Butterfield, Jeff Soft Skills for Everyone. Cengage Learning: New Delhi, 2015.
2. E. Suresh Kumar et al. Communication for Professional Success. Orient Black Swan: Hyderabad, 2015.
3. Raman, Meenakshi and Sangeeta Sharma. Professional Communication. Oxford University Press: Oxford, 2014.
4. S. Hariharanetal. Soft Skills. MJP Publishers: Chennai, 2010.

Website Sources:

- https://en.wikipedia.org/wiki/Professional_communication
- <https://www.thoughtco.com/professional-communication-1691542>
- <https://coccoer.pressbooks.com/chapter/professional-communications/>

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DPCS 501: SYSTEM ADMINISTRATION

Objective: To study about the basics of number representation, memory hierarchy and types of memory, computing along with types of MIMD architecture, how microprocessor evolved and its types, interfacing devices and about instruction classification.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(10 Sessions)**

Number representation: Fixed and Floating-Point number representation, IEEE standard for floating point representation, Booth Algorithm multiplication, Digital Computer Generation computer, Types and classification, Buses, Bus architecture.

UNIT II **(09 Sessions)**

General Register Organization: Stack Organization and addressing modes, Memory Hierarchy, Cache Memory, Main Memory, Auxiliary Memory: Magnetic disk, Magnetic tape, Virtual Memory.

UNIT III **(10 Sessions)**

Parallel Computing: Parallel Computer Model, Introduction to MIMD Architecture, Shared Memory MIMD Architecture, SIMD Architecture, PRAM Algorithms: Parallel Reduction, Prefix Sum, Preorder Tree Traversal, Merging Sorted list.

UNIT IV **(09 Sessions)**

Microprocessor Evolution and Types: Microprocessor Architecture and Operation of its Components, Addressing modes, Interrupt, Data Transfer Schemes, Instruction a data flow timer and timing diagram.

UNIT V **(06 Sessions)**

Interfacing devices: Architectural advancement of Microprocessor development schemes, Registers, Instruction Classification: Data Transfer, Arithmetic Operations, Logical operations.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understanding the fundamentals of Number representation.
CO2	Understand about register organization and how a memory hierarchy is formed and their types.
CO3	To gain the knowledge about parallel computing, computer architecture and its classification.
CO4	To learn about how a microprocessor evolved and its various types.
CO5	Understanding about interfacing devices

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	2	3	2	1	2	3
CO2	2	1	2	3	2	1	2	1
CO3	3	2	1	2	3	2	1	2
CO4	2	1	2	1	2	3	2	1
CO5	2	1	2	3	2	2	1	2

Suggested Readings:

1. M. Morris Mano and M. D. Ciletti, "Digital Design", 4th Edition, Pearson Education.
2. Kai Hwang, *Advanced Computer Architecture: Parallelism, Scalability, Programmability*, McGraw-Hill, 1993. ISBN 0-07-113342-9.
3. Gaonkar, Ramesh S, "Microprocessor Architecture, Programming and Applications with 8085", Penram International Publishing.
4. Aditya P Mathur, "Introduction to Microprocessor", TMH
5. Patterson, Computer Organization and Design, Elsevier Pub. 2009

Website Sources:

- <https://nptel.ac.in/courses/117/105/117105078/>
- <https://www.geeksforgeeks.org/computer-organization-basic-computer-instructions/>
- https://en.wikipedia.org/wiki/Computer_architecture

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(w.e.f. session 2022 – 2023)
DPCS 502: COMPUTER GRAPHICS & MULTIMEDIA

Objective: The course objective is to provide an overview of the basic fundamentals of computer graphics and detail knowledge about the graphics algorithms. It helps students enhance their skills to design and implement 2D/3D object representations, transformations, modeling and rendering algorithms.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I (08 Sessions)

Introduction: Computer Graphics, Display Device, General purpose Graphics Software, display of solids object.

UNIT II (10 Sessions)

Display Techniques and Devices: Display Techniques and Devices: Point Plotting Technique Coordinate systems and incremental methods, line-Drawing. Algorithms, circle Generators, Display Devices, CRT, Inherit Memory Devices, The storage tube display.

UNIT III (10 Sessions)

Graphic Packages and Display Files: A Simple Graphics package Segments, Functions for Segmenting the Display files, Segment naming schemes, appending the Segment display file structure. Geometric Models. Defining symbols procedures, Display Procedure.

UNIT IV (10 Sessions)

Two Dimensional Transformation: A line clipping Algorithm, Midpoint, division, clipping other Graphics Entities, Polygon Clipping, and Viewing Transformation, windowing Transformation.

UNIT V (06 Sessions)

Input Devices: Pointing and positioning Devices, Mouse lets the light pen, Three Dimensional input devices.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understand the use of the components of a graphics system.
CO2	To learn and understand the various display techniques and devices.
CO3	To implement various algorithms to scan, convert the basic geometric primitives.
CO4	To implement various algorithms to transformations, Area filling, clipping.
CO5	To learn and understand the various input devices.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	2	3	2	1	2	3
CO2	2	3	2	1	2	3	2	1
CO3	2	3	2	1	2	3	2	1
CO4	1	2	3	2	1	2	3	2
CO5	2	1	1	1	2	1	2	3

Suggested Readings:

1. Hearn, Baker – “Computer Graphics (C version 2nd Ed.)” – Pearson Education
2. Z. Xiang, R. Plastock – “Schaum’s outlines Computer Graphics (2nd Ed.)” – TMH
3. D. F. Rogers, J. A. Adams – “Mathematical Elements for Computer Graphics (2nd Ed.)” – TMH

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.javatpoint.com
- www.coursera.org
- www.tutorialandexample.com
- www.ncertbooks.guru

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DPCS 503: INTRODUCTION TO SOFTWARE ENGINEERING PRINCIPLES

Objective: In this course, students will gain a broad understanding of the discipline of software engineering and its application to develop and maintain software. It's also providing the knowledge to produce efficient, reliable, robust and cost-effective software solutions.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I

(08 Sessions)

Introduction to Software Engineering: Software Engineering Definition, Software Components, Software Characteristics, Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.

UNIT II

(10 Sessions)

Software Requirement Specifications: Requirement Engineering, Types of Requirements, Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Data Flow Diagrams, Entity Relationship Diagrams, SRS Document.

UNIT III

(09 Sessions)

Software Design: Basic Concept of Software Design, Flow Charts, Modularity-Coupling and Cohesion, Strategy of Design-Top-Down and Bottom-Up Design. Design Strategies: Function Oriented Design, Object Oriented Design

UNIT IV

(11 Sessions)

Software Testing: Testing Objectives, Unit Testing, Integration Testing, System Testing, Top-Down and Bottom-Up Testing Strategies, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Some Terminologies- Error, Mistake, Bug, Fault and Failure, Verification and Validation, Alpha and Beta Testing, Debugging

UNIT V

(07 Sessions)

Software Maintenance and Project Management: Size Estimation, Cost Estimation, The Constructive Cost Model (COCOMO), Software Maintenance, Categories of maintenance

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To understand the nature of software development and software life cycle process models.
CO2	Understanding of software requirements and the SRS documents.
CO3	Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.
CO4	To learn the basics of testing and understanding the concept of software quality assurance.
CO5	To learn and understand software maintenance and the role of project management including planning, scheduling, risk management, etc.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	2	3	2	1	2	2
CO2	2	1	2	1	2	3	2	1
CO3	2	1	2	3	2	1	2	1
CO4	1	2	3	1	2	2	1	2
CO5	3	2	1	2	3	3	2	1

Suggested Readings:

1. Roger S.Pressman, Software engineering-A practitioner's Approach, McGraw-Hill International Edition, 5th edition, 2001.
2. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers
3. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
4. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.

Website Sources:

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- en.wikipedia.org
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- books.google.co.in
- www.tutorialspoint.com

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DPCS 504: INTRODUCTION TO MANAGEMENT INFORMATION SYSTEM

Objective: This course is designed to help the students learn how to use and manage information technologies to revitalize business processes, improve business decision-making and gain competitive advantage and to understand the features of the latest technologies and their applications. It also enables students to communicate effectively in the context of MIS.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I

(08 Sessions)

Foundation Concepts: Information Systems, Information System, Framework, Role of Information System in Business, Types of Information System, System, Feedback and Control, Component of Information System, Information System Resources

UNIT II

(09 Sessions)

Information Technologies & Data Resource Management: Foundation Data Concepts, Types of Database, Database Management Approach, Database Structure Telecommunication and Computer Network Business value of Telecommunication Networks, The Internet Revolution, Role of Intranets, Extranets, Types of Telecommunication network, Telecommunication Software

UNIT III

(09 Sessions)

Business Applications: Electronic Business Systems, ERP, Supply Chain Management Systems, Customer Relationship Management Systems, IT in Business, Scope of Electronic Commerce, EPS

UNIT IV

(10 Sessions)

Development Process: System Approach, Systems Development Cycle, Development Process, System Analysis, Other Implementation Activities

UNIT V

(06 Sessions)

Management Challenges: Introduction, Ethical and Social Issues Related to Business/IT, Computer Crime, Computer Viruses and Worms, Other Challenges-Employment Challenges, Computer Monitoring, Ergonomics

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To learn the basic concepts and technologies used in the field of MIS.
CO2	To learn and understand the role information technologies and data resource management.
CO3	Understanding of the various business applications.
CO4	To learn and understand the different development process.
CO5	To learn and understand the role of the ethical, social, and security issues of information systems.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	3	2	1	2
CO2	1	2	2	1	2	3	2	1
CO3	2	1	2	3	2	1	2	3
CO4	3	2	2	1	2	3	2	1
CO5	1	2	3	2	1	2	3	2

Suggested Readings:

1. James A. O'Brien, Introduction to Information System, TMH.
2. Banerjee, U. K., & Sachdeva, R. K. Management information system: A new frame work. New Delhi: Vikas Publishing House.
3. Ahituv, N., Neumann, S., & Riley, H. N. Principles of information systems for management (4th ed.). Dubuque, IA: Wm. C. Brown Communications.

Website Sources:

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- en.wikipedia.org
- books.google.co.in
- www.smartsheet.com
- www.guru99.com/mis-definition.html

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DPCS 505: E-COMMERCE

Objective: This course is designed to help the students to gain an understanding of electronic commerce and its application as well as associated tools and techniques also obtain a good understanding of privacy and security measures for e-commerce system.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total	TS/PS	TE/PE	Total	
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

Unit-I **(09 Sessions)**

Introduction to E-Commerce: E-commerce: The revolution is just beginning, the visions and forces behind E-commerce, Understanding E-commerce. Architectural framework of Electronic Commerce, Web based E Commerce Architecture.

Unit-II **(07 Sessions)**

E-commerce business models and concepts: E-commerce Business Models, Major Business to Consumer (B2C) business models, Major Business to Business (B2B) business models, Business models in emerging E-commerce areas, How the Internet and the web change business: strategy, structure and process,

Unit-III **(12 Sessions)**

Electronic Data Interchange: Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security. Electronic Payment Systems, Need of Electronic Payment System: Study and examine the use of Electronic Payment system and the protocols used, Study Electronic Fund Transfer and secure electronic transaction protocol for credit card payment.

Unit-IV **(06 Sessions)**

Security in E Commerce: Threats in Computer Systems: Virus, Cyber Crime Network Security: Encryption, Protecting Web server with a Firewall, Firewall and the Security Policy, Network Firewalls and Application Firewalls, Proxy Server.

Unit-V **(08 Sessions)**

E-Learning and Online Education:- Define electronic learning, Discuss the benefits and drawbacks of e-Learning, The e-Learning Industry, Discuss e-Content development and tools, Describe the major technologies used in e-Learning, Discuss the different approaches for e-Learning delivery, How e-Learning can be evaluated.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Describe about Architectural framework of Electronic Commerce.
CO2	To learn and Understand E-commerce business models and concepts
CO3	To learn about Electronic Data Interchange and Need of Electronic Payment System.
CO4	Discuss about various security in E Commerce.
CO5	To learn about E-Learning and Online Education and discuss e-Content development and tools.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	3	3	2	1
CO2	1	2	2	1	2	1	2	2
CO3	2	1	2	3	2	2	1	2
CO4	3	2	2	1	2	3	2	2
CO5	3	2	1	2	3	1	2	3

Suggested Readings:

1. R. Kalakota & A.B. Whilston-' Frontiers of Electronic Commerce, Pearson Education
2. S. J. Joseph, E-Commerce: an Indian perspective, PHI
3. Electronic Commerce: A Managerial Perspective, Turban, E. et al., Prentice Hall
4. Frontiers of e-commerce, Ravi Kalakota, Pearson

Website Sources:

- https://www.tutorialspoint.com/e_commerce/index.htm
- <https://www.javatpoint.com/advantages-and-disadvantages-of-e-commerce>
- <https://www.geeksforgeeks.org/e-commerce/>

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - III Year (V Semester)
(w.e.f. session 2022 – 2023)

DOEC 051: INDUSTRIAL MANAGEMENT & ENTREPRENEURSHIP DEVELOPMENT

Objective: The objective of this course to familiar with the organizational structure, Industrial Management, importance of human resources and develop their analytical skills.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(08 Sessions)**

Introduction: Management Function: Principles of Management. Concept, Development, application and scope of Industrial Management, Production and productivity, Present day concept of Industrial Engineering.

UNIT II **(08 Sessions)**

Management Tools: Time and Motion study, work simplification: process charts and flow diagrams, Production Planning and control.

Communication: Importance, Types and Barriers in Communication, Theories of Leadership. **Motivation Theory:** Maslow's Need Hierarchy theory, Herzberg two factor theory.

UNIT III **(08 Sessions)**

Inventory control: Inventory, Inventory management techniques, cost, Deterministic models, Introduction to supply chain management.

Quality control: Basic concepts, Statistical quality control (SQC), control charts, sampling Plan, Introduction to total quality control (TQC).

UNIT IV **(08 Sessions)**

Project Planning & control: Project planning and project control. **Business planning:** Project identification & Selection, Project Report Preparation. **Intellectual Property Rights:** Introduction to IPR (Patents, Copy Right, Trade Mark), Concept and History of Patents.

UNIT V **(08 Sessions)**

Entrepreneurship Development: Definition, Requirements to be an entrepreneur, Entrepreneur and Manager Entrepreneurial Motivation: Motivating Factors, Entrepreneurship Development. **Human resource management:** Recruitment, Selection, Training.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To Understand about Management Functions.
CO2	Understand the human factors affecting the management in the industrial environment.
CO3	To Learn about inventory control and quality control models based upon given data.
CO4	Understand how the production planning and control is carried out in the industries.
CO5	Understand faster values positive attitude and interpersonal relations.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	3	2	1	2	3
CO2	1	2	2	1	2	2	1	2
CO3	2	1	2	2	1	2	3	2
CO4	3	2	2	3	2	1	2	3
CO5	1	2	3	1	2	2	1	2

Reference Books:

1. L.M. Prasad, “Principles and Practice of Management, Sultan Chand & Sons.
2. N.G.Nair, “Production and Operations Management”.
3. Hisrich Peters, “Entrepreneurship Development”-TMH.
4. R K Singhal and Sruti Singhal, “Entrepreneurship Development”-Katson Publication.

Website resources:

- <https://nptel.ac.in/courses>
- <https://en.wikipedia.org>
- <https://www.unleashedsoftware.com>
- <https://www.bigcommerce.com/>
- <https://entrepreneurhandbook.co.uk/entrepreneurship/>

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DOCE-051: DISASTER MANAGEMENT

Course Objectives:

- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I

(10 Sessions)

Introduction to Disasters: Concepts, and definitions (Disaster, Hazard, Vulnerability, Resilience, Risks), Disasters: Classification, Causes, Impacts (including social, economic, political, environmental, health, psychosocial, etc.). Differential impacts- in terms of caste, class, gender, age, location, disability Global trends in disasters urban disasters, pandemics, complex emergencies, Climate change

UNIT II

(08 Sessions)

Approaches to Disaster Risk reduction: Disaster cycle - its analysis, Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- non-structural ensures, roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), states, Centre, and other stake-holders.

UNIT III

(08 Sessions)

Disasters: hazard, global and Indian scenario, general perspective, importance of study in human life, Direct and indirect effects of disasters, long term effects of disasters. Introduction to global warming and climate change.

UNIT IV

(06 Sessions)

Natural Disasters - Natures and extent of disasters, natural calamities such as earthquake, floods, drought, coasts hazards, cloud burst, Avalanches, Cyclone, landslides etc.

UNIT V

(08 Sessions)

Manmade Disasters Chemical and industrial hazards, nuclear hazards, fire hazards, etc., Role of growing population and subsequent industrialization, urbanization and changing lifestyle of human beings in frequent occurrences of manmade disasters.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understand the fundamentals of disasters and its impacts.
CO2	To discuss about approaches to Disaster Risk reduction
CO3	To understand about direct and indirect effects of disasters, long term effects of disasters
CO4	Understand the cyclones, local storms and floods.
CO5	Know the procedures to prevent, mitigate and prepare community-based disaster risk reduction

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	3	2	1	3	2	1
CO2	1	2	1	2	2	1	2	2
CO3	2	1	2	1	2	3	2	1
CO4	3	2	3	2	2	1	2	2
CO5	1	2	1	2	3	2	1	2

Suggested Reading:

1. Sharma, V. K. (1999), "Disaster Management", National Centre for Disaster Management, IPE, Delhi
2. Anil, K. Gupta and Sreeja, S. Nair (2011), "Environmental Knowledge for Disaster Risk Management", NIDM, New Delhi
3. Nick (1991), "Disaster Management: A Disaster Manager's Handbook", Asian Development Bank, Manila Philippines
4. Kapur, et al. (2005), "Disasters in India: Studies of Grim Reality", Rawat Publishers, Jaipur

Website Sources:

- <http://cwc.gov.in>
- <http://ekdrm.net>
- <http://www.emdat.be>
- <http://www.nws.noaa.gov>

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 (w.e.f. session 2022 – 2023)
DPCS 551: SYSTEM ADMINISTRATION LAB

Objective: To study about how to install Client Operating System, Server Operating System, to perform user account management and implement security groups, perform network services installation and management.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. Installing a Client Operating System (Windows XP).
2. Installing Server Operating System (Windows Server 2008 version).
3. Creating an Active Directory.
4. Creating Various Client accounts and setting up Permissions
5. Creating a File Server, applying permissions for various users.
6. Installing LINUX/UBUNTU (Client).
7. Setting up an IIS server, hosting a website on IIS.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To install operating system such as Windows10, Windows Server 2008 etc.
CO2	Understanding the installation of Server operating system
CO3	To create client account and how permission is given for that account.
CO4	Install LINUX/UBUNTU in the system.
CO5	Setup IIS server and hosting a website on it.

Suggested Readings:

1. M. Morris Mano and M. D. Ciletti, “Digital Design”, 4th Edition, Pearson Education.
2. Kai Hwang, *Advanced Computer Architecture: Parallelism, Scalability, Programmability*, McGraw-Hill, 1993. ISBN 0-07-113342-9.
3. Gaonkar, Ramesh S, “Microprocessor Architecture, Programming and Applications with 8085”, Penram International Publishing.
4. Aditya P Mathur, “Introduction to Microprocessor”, TMH
5. Patterson, Computer Organization and Design, Elsevier Pub. 2009

Website Sources:

- https://www.tutorialspoint.com/fundamentals_of_unix_and_linux_system_administration/index.asp
- <https://www.geeksforgeeks.org/computer-organization-basic-computer-instructions/>
- https://en.wikipedia.org/wiki/Computer_architecture

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 (w.e.f. session 2022 – 2023)
DPCS 552: COMPUTER GRAPHICS LAB

Objective: The objective of this laboratory is to introduce to the students the concepts of computer graphics. It starts with an overview of interactive computer graphics, two-dimensional system and mapping, then practice drawing algorithms, two-dimensional transformation, clipping and filling.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. Write a program in C to draw a circle on screen using graphics.h header file.
2. Write a program in C to draw a rectangle and a bar on screen using graphics.h header file.
3. Write a program in C to draw an Eclipse Shape on screen using graphics.h header file.
4. Write a program in C to draw sine wave using graphics.h header file.
5. Write a program in C to draw bar chart on screen using graphics.h header file.
6. Write a program in C to draw pie chart using graphics.h header file.
7. Write a program in C to draw stars in night sky using graphics.h header file.
8. Write a program in C language to draw a line using DDA algorithm.
9. Write a program in C language to draw a line using Bresenham's algorithm.
10. Write a program in C language to draw a circle using Mid-point algorithm.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understand the basic concepts of computer graphics.
CO2	To implement various algorithms to scan, convert the basic geometric primitives,
CO3	To be able to use of computer graphics concepts in the development of computer games, information visualization, and business applications.
CO4	Apply clipping techniques for modifying an object.
CO5	Apply filling techniques for modifying an object.

Suggested Readings:

1. Hearn, Baker – “Computer Graphics (C version 2nd Ed.)” – Pearson Education
2. Z. Xiang, R. Plastock – “Schaum's outlines Computer Graphics (2nd Ed.)” – TMH
3. D. F. Rogers, J. A. Adams – “Mathematical Elements for Computer Graphics (2nd Ed.)” – TMH

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- www.javatpoint.com
- www.coursera.org
- www.tutorialandexample.com
- www.ncertbooks.guru

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 (w.e.f. session 2022 – 2023)
DPCS 601: .NET PROGRAMMING

Objective: This course is designed to help the students to get familiarize with Microsoft.Net technologies. This course also helps to understand the different concepts and features of .NET coding, debugging and developing of window and web based applications.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(08 Sessions)**
Introduction to .Net technology: Components of .Net, Framework, various types of applications developed using .Net

UNIT II **(06 Sessions)**
Introduction to .Net IDE (Integrated Development Environment): Creating a project, Handling Controls, Executing an Application

UNIT III **(08 Sessions)**
Basic language & Features of C#: Various data types in C#, Statements, Decision making, looping & Control Statements, Arrays, Procedure & Functions.

UNIT IV **(12 Sessions)**
OOPs Concept & their Implementation: OOPs Concepts, Classes, Objects, Inheritance, Polymorphism, Encapsulation, Namespaces & Interfaces, Exception Handling, Input & output Streams.

UNIT V **(08 Sessions)**
Introduction to ADO.NET (ActiveX Data Object): Connected & Disconnected ADO.NET, Creating a connection, Command, Adapter, Dataset Objects, Connection to MS Access and Servers like MS SQL.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To learn and understand .Net Framework.
CO2	An ability to develop simple and complex applications using the .Net framework.
CO3	Ability to create and manipulate basic language & features of C#.
CO4	To learn and understand the basic OOPs concepts and their implementation.
CO5	To develop database applications using ADO.Net.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	3	2	1	2
CO2	3	3	2	1	2	3	2	1
CO3	1	1	2	2	1	1	2	2
CO4	2	2	1	2	3	2	1	2
CO5	3	3	2	1	2	3	2	2

Suggested Readings:

1. Jeff Ferguson, Brain Patterson, Jason Beres, Pierre Boutqin and Meetagupta, " C# Bible", Wiley Publicaion, Inc.
2. John Sharp, "Microsoft Visual c# 2005 step by step" Microsoft
3. Complete Reference, Visual Basic .Net, 2010.

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- books.google.co.in
- www.tutorialspoint.com
- dotnet.microsoft.com
- www.w3schools.com

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(w.e.f. session 2022 – 2023)
DPCS 602: WEB DESIGNING

Objective: To study about the client server architecture and can develop web applications using Java technology. Students gain the skills and project-based experience required to enter a career in web applications and development. Students will learn the web language, responsive web design techniques including HTML and CSS media queries.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(09 Sessions)**
Introduction and web development strategies: History of Web, Protocols governing Web, Creating Websites for individual and Corporate World, Cyber Laws Web Applications, Writing Web Projects, Identification of Objects, Target Users, Web Team, Planning and Process Development.

UNIT II **(08 Sessions)**
Introduction to HTML, CSS: The development process, basic HTML, HTML tags, element, attributes, formatting and fonts, commenting code, colour, hyperlink, lists, tables, images, simple HTML forms, frames, links, Introduction to CSS.

UNIT III **(08 Sessions)**
Web Server: Introduction to Web Server, Introduction of Tomcat web Server, Accessing Web server- Tomcat and IIS

UNIT IV **(09 Sessions)**
Server side Programming: Introduction to JSP, JSP processing, JSP Application Design, Tomcat Server, Implicit JSP objects, Conditional Processing, Declaring variables and methods, Error Handling and Debugging, Sharing data between JSP pages.

UNIT V **(08 Sessions)**
Database Connectivity: Database Programming using JDBC, Studying Javax.sql.*package, accessing a database from a JSP page, Application-specific Database Action.

COURSE OUTCOMES (CO):
On the completion of this course students will be able to understand:

	DESCRIPTION
CO1	Defining the principles of web page design, basics of web design.
CO2	Recognize HTML elements; introduce the basic concepts of CSS.
CO3	To learn and understand about different type of web server
CO4	Write a server side Java application called JSP to catch form data sent from the client and store it on database.
CO5	To learn and understand about Database Connectivity

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	3	2	1	2
CO2	1	2	2	1	1	2	2	1
CO3	2	1	2	3	3	2	1	2
CO4	3	2	1	2	1	2	2	1
CO5	1	2	2	1	2	1	2	3

Suggested Readings:

1. Burdman, "Collaborative Web Development" Addison Wesley.
2. Chris Bates, "Web Programming Building Internet Applications", 2nd Edition, WILEY, Dreamtech
3. Joel Sklar, "Principals of web Design" Vikash and Thomas Learning
4. Horstmann, "CoreJava", Addison Wesley.
5. Herbert Schildt, "The Complete Reference:Java", TMH.
6. Pankaj Sharma "Introduction to Web Technology".

Website Sources:

- https://www.tutorialspoint.com/internet_technologies/website_designing.htm
- https://www.cs.uct.ac.za/mit_notes/web_programming.html
- <https://www.w3schools.com/>

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(w.e.f. session 2022 – 2023)
DPCS 603: COMPUTER HARDWARE MAINTENANCE

Objective: To study about computer maintenance, upgrades, and repairs. This course covers most areas of system improvement, including motherboard, processor, memory, and power improvements. In addition, this course explains the proper management of systems and components, and explains to students how to find and identify failed components. Students learn about powerful diagnostic hardware and software that helps the system determine the cause of problems and how to recover.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(08 Sessions)**
Basic Computer System & Peripherals: Input & Output Devices, their types and specifications, CPU, Memory devices- types primary and secondary.

UNIT II **(09 Sessions)**
Mother Board: Study of Motherboard RAM, ROM, CMOS, POST, BUS, (Address, Data, and System) Connections of various devices such as Display Adapter, Ports (Serial, Parallel, USB) and Modem on the Mother Board. Importance of CPU cooling, Motherboard troubleshooting

UNIT III **(08 Sessions)**
Serial Devices: Key Board: Switches, Keyboard organization, Key board type, Wireless Keyboard Trouble shooting. Mouse: Mouse type- Scroll & Optical Mouse, Function Connecting Mouse, Trouble shooting Mouse. Ports, Modems

UNIT IV **(09 Sessions)**
Storage Devices: HDD: HDD types, integrated, SCSI, Magnetic recording, Formatting (Track, Sector) Cluster, Defragmentation, Bad Sector, Jumper Setting, Common Problem and its trouble Shooting, External Drive (HDD), Optical Drives. CD and DVD drives: ROM and Writer, COMBO drives, Mass Storage Devices. USB Devices: Pen Drives

UNIT V **(08 Sessions)**
Parallel Devices: Printers: Working of DMP, Ink Jet, Laser Printer, and line printer, MFP (Multi Functional Printer and its Trouble shooting. Scanners- Working method and its trouble shooting Plotters, System Software, Application Software driver Software Installation, Windows and other software & Anti Virus , Setting of CMOS, Operating characteristics, Types and maintenance. BIOS/ CMOS setting

COURSE OUTCOMES (CO):
 On the completion of this course students will be able to understand:

	DESCRIPTION
CO1	Understand the basic Computer System & Peripherals.
CO2	Understand the structure of motherboard and troubleshooting of motherboard.
CO3	Understand the basic serial device.
CO4	Understand the basic storage devices.
CO5	Understand the basic parallel devices.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	2	1	1	2	2	2	2
CO2	1	2	3	3	2	1	1	2
CO3	2	1	2	1	2	2	2	1
CO4	2	2	1	2	1	2	2	2
CO5	2	2	1	1	2	2	2	2

Suggested Readings:

1. Subhadeep Choudhary, The A-Z of PC Hardware & Maintenance part I and II.
2. Govindrajalu, IBM PC and Clones.
3. Balasubramanyam, Computer Installation and Servicing.
4. William A. Lloyd, "A Guidebook in PC Hardware, Maintenance and Repair",

Website Sources:

- <https://nptel.ac.in/courses/106/105/106105194/>
- <https://www.javatpoint.com/hardware>
- https://www.tutorialspoint.com/computer_fundamentals/computer_hardware.htm

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DPCS 604: Python Programming

Objective: The subject is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(08 Sessions)**

Introduction:

Brief History of Python, Installing Python, and Features, Setting up path, working with Python, Basic Syntax, Variable and Data Types, Operator

UNIT II **(10 Sessions)**

Language Components:

Conditional Statements: If, If- else, Nested if-else

Looping: For, While, Nested loops

Control Statements: Break, Continue, Pass

String Manipulation: Accessing Strings, Basic Operations, String slices, Function and Methods

UNIT III **(10 Sessions)**

Collections:

Lists: Introduction, Accessing list, Operations, Working with lists

Tuple: Introduction, Accessing tuples, Operations

Dictionaries: Introduction, Accessing values in dictionaries, Operations

UNIT IV **(08 Sessions)**

Functions:

Defining a function, calling a function, Types of functions, Function Arguments, Return in Function, Global and local variables

UNIT V **(08 Sessions)**

Input and Output:

Input-Output, Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files

Exception Handling:

Introduction, Errors, Types of Exceptions, Try, Except and Finally Clause, Raise Exception

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	To understand why Python is a useful scripting language for developers.
CO2	To learn and understand Language Components
CO3	To learn how to use lists, tuples, and dictionaries in Python programs.
CO4	To learn how to write functions and pass arguments in Python.
CO5	To learn how to use indexing and slicing to access data and Exception Handling in Python programs.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	1	2	2	1	1	2
CO2	2	3	3	2	2	3	3	2
CO3	1	2	1	2	2	1	1	2
CO4	2	1	1	2	2	3	3	2
CO5	2	3	3	2	1	2	1	2

Suggested Readings:

1. Learning Python by Mark Lutz; Pratham Books, Bangalore
2. Foundations of Python Network Programming by John Goerzen and BrandeuRhodes;
3. Apress-eBook distributed by Springer Science and Business Media, New York
4. Dive Into Python by Mark Pilgrim; Pratham Books, Bangalore
5. Think Python by Allen B. Downey; O'Reily Media
6. Python Programming For Beginners: A Must Read Introduction to Python
7. Programming by Robert Richards; Pratham Books, Bangalore
8. e-books/e-tools/relevant software to be used as recommended by AICTE/NITTTR, Chandigarh.

Website Sources:

- onlinecourses.nptel.ac.in
- en.wikipedia.org
- <http://swayam.gov.in>
- <http://spoken-tutorial.org>
- www.studytonight.com
- www.geeksforgeeks.org

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DPCS 605: CLOUD COMPUTING

Objective: The objective of this course is to provide the basic to understand the concept of cloud computing, various issues in cloud computing, with the lead players in cloud and the emergence of cloud as the next generation computing paradigm.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT-I: (8 Sessions)

Introduction: Introduction to Cloud Computing – Definition of Cloud – Evolution of Cloud Computing – Underlying Principles of Parallel and Distributed Computing – Cloud Characteristics – Elasticity in Cloud – On-demand Provisioning.

UNIT-II: (9 Sessions)

Cloud Enabling Technologies: Service Oriented Architecture – REST and Systems of Systems – Web Services – Publish-Subscribe Model – Basics of Virtualization – Types of Virtualization – Implementation Levels of Virtualization – Virtualization Structures – Tools and Mechanisms – Virtualization of CPU – Memory – I/O Devices – Virtualization Support and Disaster Recovery.

UNIT-III: (9 Sessions)

Collaborating Using Cloud Services: Email Communication over the Cloud - CRM Management - Project Management-Event Management - Task Management – Calendar - Schedules - Word Processing – Presentation – Spreadsheet - Databases – Desktop - Social Networks and Groupware.

UNIT-IV: (8 Sessions)

Virtualization for Cloud: Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization – System Vm, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - supervisors – Xen, KVM, VMware, Virtual Box, Hyper-V.

UNIT-V: (8 Sessions)

Security, Standards and Applications: Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
CO2	Understand about the key and enabling technologies that help in the development of cloud.
CO3	Identify problems, and explain, analyze, and evaluate various cloud computing services
CO4	Provide the appropriate cloud computing solutions and recommendations according to the applications used.
CO5	Explain the core issues of cloud computing such as resource management and security.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	1	2	2	2	1	2
CO2	2	3	3	2	2	2	3	2
CO3	1	2	1	2	1	1	2	1
CO4	2	1	2	1	2	2	1	2
CO5	2	1	1	2	2	2	1	2

Suggested Readings:

1. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers
2. David E.Y. Sarna Implementing and Developing Cloud Application, CRC press 2011.
3. Rittinghouse, John W., and James F. Ransome, —Cloud Computing: Implementation, Management and Security, CRC Press, 2017.
4. James E Smith, Ravi Nair, Virtual Machines, Morgan Kaufmann Publishers, 2006

Website Sources:

- https://www.tutorialspoint.com/cloud_computing/index.htm
- <https://www.javatpoint.com/cloud-computing-tutorial>
- <https://www.geeksforgeeks.org/cloud-computing/>

IFTM UNIVERSITY, MORADABAD
Diploma (Computer Science & Engineering) Programme
Diploma (CSE) - III Year (VI Semester)
(w.e.f. session 2022 – 2023)
DOME 061: TOTAL QUALITY MANAGEMENT

Objective: The main objective of this course is to improve the quality of an organization's outputs, including goods and services, through the continual improvement of internal practices. Total quality management aims to hold all parties involved in the production process accountable for the overall quality of the final product or service.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total	TS/PS	TE/PE	Total	
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(08 Sessions)**

Quality Concepts:

Evolution of Quality control, concept change, TQM Modern concept, Quality concept in design.

Manufacturing Quality: Methods and Techniques for manufacture, Inspection and control of product, Quality in sales and services, Guarantee, analysis of claims.

UNIT II **(08 Sessions)**

Quality Management:

Organization structure and design, Quality function, decentralization, Designing and fitting organization for different types products and company,

TQM Principles: Leadership, strategic quality planning; Quality councils- employee involvement, motivation; Empowerment; Team and Teamwork; Quality circles, recognition and reward, performance appraisal; Continuous process improvement.

UNIT III **(08 Sessions)**

Tools and Techniques: Seven QC tools (Histogram, Check sheet, Ishikawa diagram, Control chart, flow chart).

Control Charts: Theory of control charts, measurement range, construction and analysis of R charts, process capability study, use of control charts, P-charts and C-charts.

UNIT IV **(08 Sessions)**

Defects Diagnosis and Prevention: Defect study, identification and analysis of defects, corrective measure, factors affecting reliability, Building reliability in the product, evaluation of reliability, interpretation of test results, reliability control, maintainability, zero defects, quality circle.

UNIT V **(08 Sessions)**

ISO and its concept of Quality Management: Quality systems, need for ISO 9000, ISO 9001-9008; Quality system- elements, documentation, requirements and benefits TQM implementation in manufacturing and service sectors, Auditing, Taguchi method, JIT in some details.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understand the fundamental principles of Total Quality Management
CO2	Choose appropriate statistical techniques for improving processes.
CO3	Develop research skills that will allow them to keep abreast of changes in the field of Total Quality Management.
CO4	Explain the various types of Techniques are used to measure Quality.
CO5	Apply various Quality Systems and Auditing on implementation of TQM.

PO-CO Mapping (Please write 3, 2, 1 wherever required)**(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	1	2	2	1	1	2
CO2	2	3	3	2	2	3	3	2
CO3	1	2	1	2	2	1	1	2
CO4	2	1	2	1	2	3	3	2
CO5	2	1	1	2	1	2	1	2

Suggested Readings:

1. Total Quality Management, by Dale H. Besterfield, Pearson India.
2. Beyond Total Quality Management, Greg Bounds, McGraw Hill.
3. Besterfield D.H. et al., Total qualityManagement, 3rd ed., Pearson Education Asia, 2006.
4. Evans J.R. and Lindsay W.M., The management and Control of Q.

Website Sources:

1. <https://qcmr-1.itrcweb.org/2-quality-concepts/>
2. <https://www.lucidchart.com/blog/8-total-quality-management-principles>
3. <https://blog.kainexus.com/improvement-disciplines/lean/control-charts/an-introduction-to-process-control-charts>
4. https://ndiastorage.blob.core.usgovcloudapi.net/ndia/2004/cmmit5Tue/Root_CauseAnalysis.pdf
5. <https://www.iso.org/iso-9001-quality-management.html>

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DOEE 061: NON-CONVENTIONAL ENERGY RESOURCES

Objective: The electrical diploma holder must be made aware about saving and conserving Electrical Energy and tackle the problems of environmental pollution as they will have to face this challenge in future life.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	3	1	0	-	4	Theory	30	70	100
Hours	3	1	0	-	4	Practical	-	-	-

UNIT I **(08 Sessions)**

Introduction: Different forms of energy, Energy chain, Classification of energy resources: Primary and secondary sources, Commercial and non-commercial sources, Conventional and non-conventional sources, Classification of non-conventional energy resources

UNIT II **(08 Sessions)**

Solar Energy: Basics of photovoltaic energy conversion, Types of solar photovoltaic cells, Solar photovoltaic module, V-I and P-V characteristics of PV module, Efficiency of PV module, Applications of Solar photovoltaic systems, Solar Thermal Power Plant, Efficiency of solar thermal power plant, Solar water heater

Wind Energy: Wind energy conversion, Types of wind power plants, merits and demerits of wind power generation

UNIT III **(08 Sessions)**

Geothermal Energy: Introduction to geothermal energy, Resources of geothermal energy, geothermal power plants, Merits and demerits of geothermal power generation, applications of geothermal energy

Magneto-Hydro-Dynamic (MHD) Power Generation: Introduction to MHD power generation, Open cycle MHD system, closed cycle MHD system, working principle of MHD power generation, Advantages of MHD power generation

UNIT IV **(08 Sessions)**

Fuel Cells: Working principle and operation of fuel cells, Types of fuel cells, Performance analysis of fuel cell, advantages of fuel cells, limitations of fuel cells, applications of fuel cells

Bio Energy-Biomass and Biogas: Biomass conversion process, biogas generation, factors affecting generation of biogas, types of biogas plants, selection of site for biogas plant

UNIT V **(08 Sessions)**

Ocean Thermal Energy Conversion (OTEC): Working principle of OTEC, availability, types of OTEC systems, advantages of OTEC, limitations of OTEC power plant, applications of OTEC power plant

Ocean Wave energy and Tidal Energy: Wave energy, Tidal energy, Tidal Power plants, Classification of tidal power plant, Advantages and Limitations of tidal power

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Understand the importance of non-conventional energy sources for the present energy scenario.
CO2	Understand various alternate sources of energy like solar and wind energy.
CO3	Understand basic conversion technologies of geo-thermal & magneto hydrodynamics
CO4	Understand various fuel cells and its applications.
CO5	Understand Ocean Thermal Energy & Tidal energy for power plants and other applications.

PO-CO Mapping (Please write 3, 2, 1 wherever required)

(Note: 3 for highly mapped, 2 for medium mapped and 1 for low mapped)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	1	2	1	1	2	2	2
CO2	2	3	2	3	3	2	1	1
CO3	1	2	2	1	1	2	2	2
CO4	2	1	2	3	3	2	1	1
CO5	2	1	1	2	1	2	2	2

Suggested Readings:

1. S. Hasan Saeed, "Non-Conventional Energy Resources", S. K. Kataria & Sons, New Delhi
2. Non-Conventional Energy Resources by RK Singal; S. K. Kataria & Sons, New Delhi
3. Solar Energy Utilization; GD Rai; Khanna Publishers, New Delhi

Website Sources:

- Renewable energy - Wikipedia
- Non Conventional Energy Resources - Ashish Chandra - Google Books
- Non-Conventional Energy Resources - Bansal N.K. - Google Books

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DPCS 651: .NET PROGRAMMING LAB

Objective: This course will help the students to use C# programming to build Windows applications using object-based programming techniques. Students will also cover all the concepts of .net technology.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. Print “Hello C#” in C#.
2. Implement break statement in C#.
3. Implement loop statement in C#.
4. Write a Program in C# to find the roots of Quadratic Equation.
5. Write a Program in C# to check whether a number is even or not.
6. Write a Program in C# to read and print elements of an array.
7. Write a Program in C# to implement polymorphism.
8. Write a Program in C# to implement single inheritance.
9. Write a Program in C# to input marks in 5 subjects and calculate aggregate & percentage.
10. Write a program using function overloading to swap two integer numbers and swap two float numbers.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Ability to practice program with console application in C#.
CO2	To learn and understand the basic OOPs concepts and their implementation.
CO3	To develop database applications using ADO.Net.
CO4	To perform database operations for Windows Form and web applications.
CO5	To develop windows applications using C#

Suggested Readings:

1. Jeff Ferguson, Brain Patterson, Jason Beres, Pierre Boutqin and Meetagupta, " C# Bible", Wiley Publicaion, Inc.
2. John Sharp, “Microsoft Visual c# 2005 step by step" Microsoft
3. Complete Reference, Visual Basic .Net, 2010.

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- en.wikipedia.org
- books.google.co.in
- www.tutorialspoint.com
- dotnet.microsoft.com
- www.w3schools.com

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DPCS 652: WEB DESIGNING LAB

Objective: To study about the basic understanding of the basic elements in HTML and how to use tables, frames and forms in HTML.

Teaching Scheme					Examination Scheme (Marks)				
Per week	Lecture		Practical (Lab)		Total		TS/PS	TE/PE	Total
	L	T	P	TW					
Credit	0	0	2	-	2	Theory	-	-	-
Hours	0	0	2	-	2	Practical	30	70	100

List of Experiments

1. To understand basic elements in HTML.
2. To understand use of table in HTML.
3. To understand use of frame in HTML.
4. To understand use of form in HTML.
5. To understand validation in HTML through JAVASCRIPT.
6. To understand the use of XML.
7. To understand the installation and working of TOMCAT Server.
8. To understand the use of Cookies in Servlet.
9. To understand the JSP.
10. To understand the connectivity of JDBC.

COURSE OUTCOMES (CO):

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

	DESCRIPTION
CO1	Demonstrate knowledge and skills using various HTML tags for designing static web pages.
CO2	Design a screen-based user interface using graphic text components.
CO3	To understand the connectivity of JDBC.
CO4	To understand the installation and working of TOMCAT Server.
CO5	To understand the JSP.

Suggested Readings:

1. Burdman, “Collaborative Web Development” Addison Wesley.
2. Chris Bates, “Web Programming Building Internet Applications”, 2nd Edition, WILEY, Dreamtech

Website Sources:

- <https://www.tutorialspoint.com/html/index.htm>
- https://www.w3schools.com/html/html_exercises.asp