RADHA GOVIND UNIVERSITY
RAMGARH, JHARKHAND

Department of Computer Science & Engineering

Under Faculty of Engineering and Technology

Choice Based Credit System Curriculum for Diploma in Computer Science & Engineering

(Effective from Academic Session 2025-26)

Scheme of Teaching and Examination for

1st Semester of 3 Years Diploma in Engineering (All Branches except Non Tech

Duration : 14 Weeks

Contact Hours : 36 Hrs

Total Marks : 800

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Communication Skill – I	101	Theory	3	-	-	3	100	80	20	26	40
2.	Engineering Math – I	102	Theory	3	1	-	3	100	80	20	26	40
3.	Engineering Physics - I	103	Theory	3	-	-	3	100	80	20	26	40
4.	Engineering Chemistry – I	104	Theory	3	-	-	3	100	80	20	26	40
5.	Engineering Graphics – I Th	105	Theory	2	-	-	4	50	40	10	13	20
6.	Fundamental of Computer	106	Theory	2	-	-	3	50	40	10	13	20
7.	Engineering Physics Lab – I	107	Practical	-	-	2	4	50	40	10	13	20
8.	Engineering Chemistry Lab- I	108	Practical	-	-	2	4	50	40	10	13	20
9	Engineering Graphics – I SS	109	Sessional	-	-	4	-	50	30	20	-	25
10	Communication Skill I	110	Sessional	-	-	2	-	50	30	20	-	25
11.	Fundamental of Computer – I	111	Sessional	-	-	2	-	50	30	20	-	25
12.	Workshop – I	112	Sessional	-	-	4	-	50	30	20	-	25
Total Hours of Teaching per week :				16	1	16						

Scheme of Teaching and Examination for

2nd Semester of 3 Years Diploma in Engineering (All Branches except Non Tech)

Duration of Semester : 14 Weeks
Student Contact Hours : 36 Hrs Total
Marks : 800

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Communication Skill – II	201	Theory	3	-	-	3	100	80	20	26	40
2.	Engineering Math – II	202	Theory	3	1	-	3	100	80	20	26	40
3.	Engineering Physics - II	203	Theory	3	-	-	3	100	80	20	26	40
4.	Engineering Chemistry - II	204	Theory	3	-	-	3	100	80	20	26	40
5.	Programming in C	205	Theory	3	-	-	3	100	80	20	26	40
6.	Engineering Physics II	206	Practical	-	-	2	3	50	40	10	13	20
7.	Engineering Chemistry II	207	Practical	-	-	2	3	50	40	10	13	20
8.	Programming in C	208	Sessional	-	-	4	3	50	30	20	-	25
9.	Workshop Practices	209	Sessional	-	-	4	4	100	60	40	-	50
10.	Professional Practice I	210	Sessional	-	-	4	-	50	30	20	-	25
	Total Hours of Teaching per week :			**15**	**1**	**16**						

Scheme of Teaching and Examination for
3rd Semester of 3 Years Diploma in Computer Science &Engineering

Duration of Semester : 14 Weeks

Student Contact Hours : 36 Hrs

Total Marks : 800

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Math III	301	Theory	4		-	3	100	80	20	26	40
2.	Electronic Devices and circuits	ECE303	Theory	3	-	-	3	100	80	20	26	40
3.	Electrical Technology	ECE304	Theory	3	-	-	3	100	80	20	26	40
4.	Object Oriented Programming	CSE303	Theory	3	-	-	3	100	80	20	26	40
5.	Web Technology	CSE 304	Theory	3	-	-	3	100	80	20	26	40
6.	Electronic Devices and Circuits Lab	ECE307	Practical	-	-	4	4	100	80	20		40
7.	Electrical Technology Lab	ECE308	Practical	-	-	2	4	50	40	10		20
8.	Object Oriented Programming Lab	CSE305	Practical			2	4	50	40	10		20
9.	Web Technology Lab	CSE306	Sessional			2		50	30	20	-	25
10.	Development of Life Skills I	302	Sessional	-	-	4		50	30	20	-	25
	Total Hours of Teaching per week :			16		14						

RADHA GOVIND UNIVERSITY

Scheme of Teaching and Examination for

4th Semester of 3 Years Diploma in Computer Science & Engineering

Duration of Semester : 14 Weeks

Student Contact Hours : 36 Hrs

Total Marks : 800

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam /committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Data Structure & Algorithm	CSE 402	Theory	3		-	3	100	80	20	26	40
2.	Computer Hardware & Peripheral	ECE403	Theory	3	-	-	3	100	80	20	26	40
3.	Operating System	CSE403	Theory	3	-	-	3	100	80	20	26	40
4.	Data Communication andComputer Networking	ECE405	Theory	3	-	-	3	100	80	20	26	40
5.	Data Base Management System	CSE404	Theory	3	-	-	3	100	80	20	26	40
6.	Operating System Lab	CSE405	Practical	-	-	2	4	50	40	10	-	20
7.	Data Base Management SystemLab	CSE406	Practical	-	-	2	4	50	40	10	-	40
8.	Data Structure Lab	CSE407	Practical	-		2	-	50	40	10	-	20
9.	Computer Networking Lab	ECE410	Sessional	-		2	-	50	30	20	-	25
10.	Computer Workshop	CSE408	Sessional	-	-	4	-	50	30	20	-	25
11.	Professional Practice II	401	Sessional	-	-	4	-	50	30	20	-	25
	Total Hours of Teaching per week :			15		16						

Scheme of Teaching and Examination for
5 th Semester of 3 Years Diploma in Computer Science & Engineering

Duration of Semester   :   14 Weeks

Student Contact Hours   :   36 Hrs

Total Marks   :   800

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Microprocessors & Microcontrollers	CSE 503	Theory	3	-	-	3	100	80	20	26	40
2.	Java Programming	CSE 504	Theory	3	-	-	3	100	80	20	26	40
3.	Computer Graphics	CSE505	Theory	3	-	-	3	100	80	20	26	40
4.	Elective I	CSE 506/507/508	Theory	3	-	-	3	100	80	20	26	40
5.	Elective II	CSE 509/510/511	Theory	3	-	-	3	100	80	20	26	40
6.	Java Programming Lab	CSE512	Practical	-	-	2	4	50	40	10	-	20
7.	Computer Graphics Lab	CSE513	Practical	-	-	2	4	50	40	10	-	20
8.	Elective I lab	CSE 514/515/516	Sessional	-	-	2	-	50	30	20	-	25
9.	Elective II Labs	CSE 517/518/519	Sessional	-	-	2	-	50	30	20	-	25
10	In Plant Training	502	sessional	-	-	-	-	50	30	20	-	25
11	DLS	501	Sessional	-	-	4		50	30	20	-	25
Total Hours of Teaching per week				15		14						

Scheme of Teaching and Examination for

6th Semester of 3 Years Diploma in Computer Science & Engineering

Duration of Semester : 14 Weeks

Student Contact Hours : 36 Hrs

Total Marks : 800

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Industrial Engineering & Management	601	Theory	3	-	-	3	100	80	20	26	40
2.	Network Security	CSE 604	Theory	3	-	-	3	100	80	20	26	40
3.	Software Engineering & Tools	CSE 605	Theory	3	-	-	3	100	80	20	26	40
4.	Elective III	CSE 606/607/608	Theory	3	-	-	3	100	80	20	26	40
5.	Elective IV	CSE 609/610/611	Theory	3	-	-	3	100	80	20	26	40
6.	Network Security Lab	CSE 612	Sessional	-	-	2	-	50	30	20	-	25
7.	Software Engineering & Tools Lab	CSE613	Sessional	-	-	2	-	50	30	20	-	25
8.	Elective III Lab	CSE 614/615/616	Sessional	-		2	-	50	30	20	-	25
9.	Elective IV Lab	CSE 617/618/619	Sessional	-		2	-	50	30	20	-	25
10	Project Work	603	Sessional	-	-	4	-	50	30	20	-	25
11	Professional Practices	602	Sessional	-	-	4	-	50	30	20	-	25
	Total Hours of Teaching per week:			15		16						

Elective III (Image Processing- CSE-606/ Cloud Computing-CSE 607/UML -CSE 608) Elective IV (Animation & Multimedia- CSE609/Script Programming- CSE 610/IoT-CSE-611)

Scheme of Teaching and Examination for

1st Semester of 3 Years Diploma in Engineering (All Branches except Non Tech

Duration   : 14 Weeks

Contact Hours   : 36 Hrs

Total Marks   : 800

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Communication Skill – I	101	Theory	3	-	-	3	100	80	20	26	40
2.	Engineering Math – I	102	Theory	3	1	-	3	100	80	20	26	40
3.	Engineering Physics - I	103	Theory	3	-	-	3	100	80	20	26	40
4.	Engineering Chemistry – I	104	Theory	3	-	-	3	100	80	20	26	40
5.	Engineering Graphics – I Th	105	Theory	2	-	-	4	50	40	10	13	20
6.	Fundamental of Computer	106	Theory	2	-	-	3	50	40	10	13	20
7.	Engineering Physics Lab – I	107	Practical	-	-	2	4	50	40	10	13	20
8.	Engineering Chemistry Lab- I	108	Practical	-	-	2	4	50	40	10	13	20
9	Engineering Graphics – I SS	109	Sessional	-	-	4	-	50	30	20	-	25
10	Communication Skill I	110	Sessional	-	-	2	-	50	30	20	-	25
11.	Fundamental of Computer – I	111	Sessional	-	-	2	-	50	30	20	-	25
12.	Workshop – I	112	Sessional	-	-	4	-	50	30	20	-	25
Total Hours of Teaching per week :				16	1	16						

Total Marks : Theory : Practical : Sessional :

L : Lecture, T : Tutorial P : Practical

Note: 1. Period of Class hours should be of 1 hrs duration as per AICTE norms.

2. Remaining Hrs every week has been marked for students Library and Student Centered Activities.

3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.

4. Board will depute examiner for Practical examination.

5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

Course Name : 03 Years Diploma in Engineering

Semester   : 1ˢᵗ

Subject Title: Communication skills-

I Subject Code : 101

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
L TH	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03	1		100	80	20	26	40	3 Hrs

NOTE:

Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

RATIONALE:

The comprehensive knowledge of communication and communication skill is essential for role of technicians in industry. Diploma pass outs are key persons between workforce and management and they need to be most effective in communication skills. The communication often includes grammar of the language in practice which is these days English. The in house practice before the faculty as part of scheme will develop the abilities in students a practical aspect of effective communication. Further exercises have been included for improving oral communication. Practical exposure gives a comprehensive communication skill effectiveness.

OBJECTIVES:

1. Comprehend the given passage

2. Answer correctly the questions on seen and unseen passages

3. Increase the vocabulary

4. Apply rules of grammar for correct writing

Name of the Topic	Hours	Total Marks
PART-II : Application of Grammar	10	18

- Verbs
- Tense
- Do as directed (active/passive, Direct/Indirect, affirmative/negative/assertive/interrogat ive, question tag, remove too, use of article, preposition, conjunction, punctuation)
- Correct the errors from the sentences.

	Hours	Total Marks
PART-III : Paragraph Writing	04	8

- Types of Paragraph (Narrative, Descriptive, Technical)
- Unseen passage for Comprehension.

	Hours	Total Marks
PART-IV : Vocabulary Building.	06	12

- Synonyms
- Antonyms
- Homophones
- Use of Contextual word in a given Paragraph

	Hours	Total Marks
PART-V : Soft Skill Development	08	16

- Speaking Skill
- Introduction to Group Discussion
- Process of Group Discussion
- Leadership skill
- Instant public speaking

	Hours	Total Marks
PART-VI Etiquettes &Body Language	4	8

- Telephone etiquettes listening/speaking
- Problems of telephonic Conversation
- Verbal/ oral etiquettes
- Physical appearance
- Eye Contact/Body Language
- Group Discussion

	Hours	Total Marks
Total	42	80

CONTENTS: Theory

Name of Topic	Hours	Marks
PART : 1 TEXT • Comprehension-Responding to Questions from text (Spectrum) • Vocabulary-Understanding meaning of new word from text. • Identifying part of Speech from text.	10	18

List of Assignment :

1. **Building of Vocabulary**
   25 words from the glossary given at the end of each chapter, to be used to make sentences.

2. **Applied Grammar**
   Identify the various parts of speech and insert correct parts of speech in the sentences given by the teachers.

3. **Punctuation**
   Punctuation 20 sentences given by the teachers.

4. **Tenses**
   List 12 tenses and give two examples for each tense.

5. **Dialogue Writing**
   Write at least two dialogues on different situations. (Conversation between two friends, conversation between two politicians etc.)

6. **Identifying the Error**
   Identify the error in the sentences given by the teachers. (20 Sentences)

7. **Idioms and Phrases**
   Use of Idioms and Phrases in sentences. (20 Examples)

8. **Biography**
   Write a short biography on your favorite role model approximately. (250- 300 words with pictures)

ACTIVITIES TO BE CONDUCTED DURING PRACTICALS

01. Student should perform role-plays on the situations given by the teachers. (04 Hours)
   02.(e.g. V. Sasikumar & Dhamija 2nd edition (04 Hrs) or Linuga Phon L-21 Multimedia (Desirable)

Reference

- Web Sites for Reference :

Serial No.	Website Address
01	www. edufind.com
02	www.english_the _the_easy_eay.com
03	www.englishclub.com
04	www.english_grammar_lessons.com
05	www.wikipedia.org/wiki/english_grammar

Course Name: 03 Years Diploma in Engineering

Semester   : First

Subject Title : Engineering Chemistry-I

Subject Code : 104 / 108

Teaching and Examination Scheme:

Teaching Scheme			Examination					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03			100	80	20	26	40	3 Hrs
Practical		2	50	40	10	13	20	4 Hrs

NOTE:
Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

RATIONALE:

Chemistry is a basic science subject which is essential to all engineering courses. It gives knowledge of engineering materials, their properties, related applications & selection of materials for engineering applications.

Due to technological progress there are hazardous effects on environment & human life. The core knowledge of environmental effects will bring awareness in students about the precautions & preventions to be taken to reduce the ill effects.

This subject will generate curiosity of carrying out further development in engineering fields.

OBJECTIVES: The student will be able to:

1. Draw the orbital configuration of different elements.

2. Represent the formation of molecules schematically.

3. Describe the mechanism of electrolysis.

4. Identify the properties of metals & alloys related to engineering applications.

5. Identify the properties of non metallic materials, related to engineering applications.

6. Compare the effects of pollutants on environments & to suggest preventive measures & safety.

Content: Theory

Chapter No.	Name of the Topic	Hours	Marks
01	**Atomic Structure** Definition of Atom, Fundamental Particles of Atom – their Mass, Charge, Location, Definition of Atomic no, Atomic Mass no., Isotopes & Isobars, & their distinction with suitable examples, Bohr's Theory, Definition, Shape of the orbitals & distinction between Orbits & Orbitals, Hund's Rule, Aufbau's Principle (till Atomic no. 30), Definition & types of valency (Electrovalency & Covalency), Octet Rule, Duplet Rule, Formation of Electrovalent & Covalent Compounds e.g. Nacl, $CaCl_2$, MgO, $AlCl_3$, CO_2, H_2O, Cl_2, NH_3, C_2H_4, N_2, C_2H_2. Distinction between electrovalent & covalent compounds.	06	12
02	**Electrochemistry** Electrolytic dissociation, Arrhenius Theory of Ionisation, Degree of Ionisation & factors affecting degree of ionization. Significance of the terms involved in Electrolysis- Such as Conductors, Insulators Dielectrics, Electrolyte, Non Electrolyte, Electrolysis, Electrolytic Cell, Electrodes. Mechanism of Electrolysis. Concept of electrode potential such as reduction potential & oxidation potential. Electrochemical Series, Electrolysis of $CuSO_4$ Solution by using Cu Electrode & Platinum Electrode, Electrolysis of NaCl solution & fused NaCl by using carbon electrode, Faraday's first & second law of Electrolysis & Numericals, Electrochemical Cells & Batteries, Definition, types such as Primary & Secondary Cells & their examples. Construction, Working & Applications of Dry Cell & Lead – Acid Storage Cell, Applications of Electrolysis such as Electroplating & Electro refining, Electrometallurgy & Electrotyping	08	16

03	**Metals & Alloys** **3.1 Metals (Marks:10)** Occurrence of Metals, Definition of Metallurgy, Mineral, Ore, Gangue, Flux & Slag, Mechanical Properties of metals such as Hardness, Toughness, Ductility, Malleability, Tensile strength, Machinability, Weldability, Forging, Soldering, Castability. Stages of Extraction of Metals from its Ores in detail i.e. Crushing, Concentration, Reduction, Refining. Physical Properties & Applications of some commonly used metals such as Fe, Cu, Al, Cr, Ni, Sn, Pb, Zn, Co, Ag, W. **3.2 Alloys (Marks: 08)** Definition of Alloy, Purposes of Making alloy. Preparation Methods, Classification of Alloys such as Ferrous & Non Ferrous & their examples. Composition, Properties & Applications of Alnico, Duralumin, Dutch Metal, German Silver / Nickel Silver, Gun Metal, Monel metal, Wood's Metal, Babbit metal.	10	18
04	**Non Metallic Materials** **4.1 Plastics (Marks: 04)** Definition of Plastic, Formation of Plastic by Addition & Condensation Polymerisation by giving e.g. of Polyethylene & Backelite plastic Respectively, Types of Plastic, Thermosoftening & Thermosetting Plastic, with Definition, Distinction & Compounding of Plastics – Resins, Fillers, Plasticizers, Acceleraters, Pigments & their examples, Engineering Applications of Plastic based on their properties. **4.2 Rubber (Marks: 04)** Natural Rubber: Its Processing, Drawbacks of Natural Rubber, Vulcanisation of Rubber with Chemical Reaction. Synthetic Rubber: Definition, Distinction Between natural & synthetic rubber. Properties of rubber such as elasticity, abrasion resistant, stress & strain and related engg. application. **4.3 Thermal Insulating Materials (Marks: 04)** Definition ,& types. Characteristics of insulators. Thermal insulators. Properties & Applications o f glasswool, Asbestos, Cork.	06	12

05	**Environmental Effects (Awareness Level)** **5.1 Pollution & Air pollution (Marks 10)** Definition of pollution & pollutant, Causes of Pollution, Types of Pollution - Air & Water Pollution. **Air Pollution** Definition, Types of Air pollutants their Sources & Effects, Such as Gases, Particulates, , Radio Active Gases, Control of Air Pollution, Air Pollution due to Internal Combustion Engine & Its Control Methods, Deforestation their effects & control measures. Causes , Effects & control measures of Ozone Depletion & Green House Effects**.** **5.2 Water Pollution & Wastes (Marks 12)** Definition, Causes & Methods of Preventing Water Pollution, Types of Waste such as Domestic Waste, Industrial Waste, their Physical & Biological Characteristics, Concept & significance of BOD, COD, Biomedical Waste & E – Waste, their Origin, Effects & Control Measures. Preventive Environmental Management (PEM) Activities.	12	22
	Total	**42**	**80**

Practical:

Intellectual Skills: 1. Analyse given solution
2. Interpret the results

Motor Skills   :   1. Observe Chemical Reactions
2. Measure the quantities Accurately
3. Handle the apparatus carefully

List of Experiments:

01 – 07   Qualitative Analysis of **four salts ,** Containing One Basic & One
Acidic Radical Listed below

Basic Radicals:

Pb^{+2}, Cu^{+2}, Al^{+3}, Fe^{+2}, Fe^{+3}, Cr^{+3}, Zn^{+2}, Ni^{+2}, Ca^{+2}, Ba^{+2}, Mg^{+2}, K^{+}, NH^{+}.

Acidic Radicals:

Cl^{-}, Br^{-}, I^{-}, CO_3^{-2}, SO_4^{-2}, NO_3^{-}.

05   To Determine E.C.E. of Cu by Using $CuSO_4$ Solution & Copper Electrode

06   To standardize $KMnO_4$ using Sodium oxalate.

07   To determine percentage of Fe in the given mohr's salt.

08   To Prepare a chart to showing application of metals like Fe, Cu, Al, Cr, Ni, Sn, Pb, Co.

09   To determine Carbon Monooxide, CO_2 content emission from petrol vehicle
10   To Determine Dissolved Oxygen in a Water Sample.

Reference Books:

Sr. No.	Author	Name of the book	Publisher
01	Jain & Jain	Engineering Chemistry	Dhanpat Rai and Sons
02	S. S. Dara	Engineering Chemistry	S. Chand Publication
03	B. K. Sharma	Industrial Chemistry	Goel Publication
04	S. S. Dara	Environmental Chemistry & Pollution Control	S. Chand Publication
05	Vedprakash Mehta	Polytechnic Chemistry	Jain brothers
06	Uppal	Engineering Chemistry	

Course Name : 03 Years Diploma in Engineering

Semester   : First
Subject Title : Engineering Graphics-I

Subject Code : 105

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
02	0	4	50+50	40+30	10+20	13 TH	20+25	4 Hrs (TH)

NOTE:

Internal marks for theory will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

RATIONALE:

Normally Graphical representation are used for expressing intents and contents. Engineering Graphics is the language of engineers. The concepts of Engineering Graphics are used to develop, express the ideas, and conveying the instructions which are used to carry out jobs in the field Engineering. The course illustrates the techniques of graphics in actual practice. This preliminary course aims at building a foundation for the further course in drawing and other allied subjects.

OBJECTIVES:

The student should be able to:-

1) Draw different engineering curves and know their applications.

2) Draw orthographic projections of different objects.

3) Visualize three dimensional objects and draw Isometric Projections.

4) Use the techniques and able to interpret the drawing in Engineering field.

5) Use computer aided drafting packages.

Chapter		Name of Topic	No. of Sheet	No. of Hr.	
				Theory	Practical
01.	1.1	Drawing Instruments and sheet layout	02	01	04
	1.2	Letters and Numbers as per BIS: SP46-2003			
	1.3	Scale (Plane and diagonal scale)			
02	2.1	Curves and Conic Section To draw ellipse by directrix and arc of circle method	01	02	04
	2.2	To draw parabola by directrix and rectangle method			
	2.3	To draw hyperbola by rectangle and directrix method.			
03	3.1	Introduction to orthographic projection. Projection of point on principal, auxiliary and profile planes.	01	01	04
	3.2	Idea of shortest distance.			
04		Projection of straight line on principal plane in the following cases.	01	02	04
	4.1	Parallel to both H.P and V.P			
	4.2	Inclined to one plane and parallel to other plane.			
	4.3	Inclined to both plane.			
05	5.1	Projection of different simple shapes eg. Circle, Triangle, Rectangle, Pentagon, & Hexagon on principal plane (Inclined to one plane and to both planes)	01	02	04
06	6.1	Projection of simple solid. Projection of Prism, Pyramid, Cone, Cylinder, and Cube with their axis inclined to one reference plane and parallel to other.	01	02	04
07	7.1	Section of simple solids with true shape of sectioned portion.	01	02	04
	7.2	Development of solid surfaces eg. Prism, Cylinder, Cone, Pyramid and Cubes.			

08	8.1	Isometric Scale and their use in drawing isometric views of single and compound solids. (Simple case only)	01	02	04

09	9.1	Intersection of solids. Curves of intersection of the surfaces of the solids in the following case;
		  a. Prism with Prism
		  b. Cylinder with cylinder
		  c. Prism with cylinder
		  d. Cylinder with cone
		     with different axis.
			01	02	04

10	10.1	Prospective Projection	01	02	04
11	11.1	AutoCAD Basics, Layers, multi-layer images, graphic interfaces, different views to be drawn.	03	10	16
		Total-	**14**	**28**	**56**

References:

Sl. No.	Author	Title	Publication
1.	N.D.Bhatt	Engineering Drawing	Charotkar Publishing House
2.	R.K.Dhawan	Engineering Drawing	S.Chand Co.
3.	K.R.Mohan	Engineering Graphics	Dhanpat Rai & Publication Co.
4.	P.J.Shah	Engineering Drawing	----
5.	P.S.Gill	Engineering Drawing	----

Course Name : 03 Years Diploma in Engineering

Semester   : First

Subject Title : Engineering Mathematics-1

Subject Code : 102

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
L TH	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03	01		100	80	20	26	40	3 Hrs

NOTE:

Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

RATIONALE:

Mathematics provides foundation for all engineering subjects. Deep thought is given while selecting topics of this subject known as "Engineering Mathematics" which intends to teach students basic facts, concepts and principles of mathematics as a tool to analyze engineering problems. It lays down the foundation for understanding core engineering and technology subjects.

OBJECTIVE:

This subject helps the students to develop logical thinking, which is useful in comprehending the principles of all other subjects. Analytical and systematic approach towards any problem is developed through learning of this subject. Mathematics being a versatile subject can be used as a tool at every stage of human life.

Sub Objective:

This subject is divided into four units 1) Algebra, 2) Trigonometry, 3) Coordinate Geometry and

4) Vector. Upon completion of these Units the student shall be able to:

1.1 Use Logarithms in engineering calculations
1.2 Resolve Rational Fraction into sum of Partial Fractions in engineering problems
1.3 Use Matrices for solving engineering problems
1.4 Understand the concept of Binomial Expansion and use of Permutation & Combination

2.1 Solve simple problems on Compound Angles
2.2 Solve problems using the formulae for Multiple and Sub- multiple Angles
2.3 Apply Transformations for solving the problems in Trigonometry
2.4 Use Inverse Trigonometric Functions for solving engineering problems
2.5 Understand Properties of triangles

3.1 Appreciate the concept of position of any point in a plane or in space
3.2 Distance between two points and its application in solving engineering problems
3.3 Solve the problems on straight line
3.4 Solve the problems on Circles

4.1 Appreciate the concept of a new type of physical quantity called Vector
4.2 Algebra of Vectors
4.3 Solve engineering problems like work done, moment of force about a point as well as about a line.

Chapter No.	NAME OF TOPICS	Hours	Marks
	ALGEBRA		
1	**1.1 Prerequisites Revision of** ▪ Arithmetic, Geometric and Harmonic Progressions, ▪ Formula of nth term and sum to n-terms of A.P. and G.P. ▪ Expression of $\sum n$, $\sum n^2$ and $\sum n^3$. ▪ Quadratic equations with real coefficients and relation between their roots & coefficient	01	01
	1.2 Logarithms: ▪ Definition of logarithm (Natural and Common logarithm.) ▪ Laws of logarithm ▪ Examples based on 1.2.1 to 1.2.2	03	04
	1.3 PARTIAL FRACTION ▪ Definition of Polynomial Fraction Proper & Improper Fractions and definition of Partial fractions. ▪ To Resolve proper fraction into partial fraction with denominator containing non repeated linear factors, repeated linear factors and irreducible non repeated quadratic factors. ▪ To resolve improper fraction into partial fraction.	03	06

		1.4 DETERMINANT AND MATRICES. **Determinant** **4 Marks** ▪ Definition and expansion of determinants of order 2 and 3. ▪ Cramer's rule to solve simultaneous equations for 2 and 3 unknowns. **Matrices** **12Marks** ▪ Definition of a matrix of order m X n and types of Matrices with examples. ▪ Algebra of matrices such as equality, addition, subtraction, scalar multiplication and multiplication of two matrices. ▪ Transpose of a matrix. ▪ Minor, Cofactor of an element of a matrix, adjoint of matrix and Inverse of matrix by Adjoint method. ▪ Solution of simultaneous equations containing 2 and 3 unknowns by matrix inversion method. ▪ Idea of Rank of Matrix and their calculation	08	16
		1.5 BINOMIAL THEOREM ▪ Definition of factorial notation, definition of permutation and combinations with formula (without proof). ▪ Derivation of simple identities and solution based on it ▪ Binomial theorem for positive index. ▪ General term, Middle term, independent term and coefficient of x^n ▪ Binomial theorem for negative index (only idea). ▪ Approximate value (only formula)	02	04
2		TRIGONOMETRY		
		2.1 REVISION ▪ Measurement of an angle (degree and radian). Relation between degree and radian. ▪ Trigonometrical ratios of 0^0, 30^0, 45^0, 60^0, 90^0, $90^0\pm\theta$, $180^0\pm\theta$ and $360^0\pm\theta$ ▪ Fundamental identities.	01	01
		2.2 TRIGONOMETRIC RATIOS OF ALLIED, COMPOUND, MULTIPLE & SUBMULTIPLE ANGLES Questions based on numerical computations.	03	06
		2.3 **Transformation** formula of Product into sums or difference and vice versa, simple problems based on it	03	06
		2.4 **INVERSE TRIGONOMETRIC RATIOS** ▪ Definition of inverse trigonometric, ratios, Principal values of	02	04

	inverse trigonometric ratios. ▪ Relation between inverse trigonometric ratios.		
	2.5 PROPERTIES OF TRIANGLE Sine, Cosine, Projection and tangent rules (without proof). Simple problems.	02	04
03	COORDINATE DISTANCES		
	3.1 POINT AND DISTANCES ▪ Distance formula, Section formula, midpoint, centroid of triangle. ▪ Area of triangle and condition of collinearity.	**2**	**04**
	3.2 STRAIGHT LINE ▪ Slope and intercept of straight line. ▪ Equation of straight line in slope point form, slope-intercept form, two-point form, two-intercept form, normal form. General equation of line ▪ Angle between two straight lines condition of parallel and perpendicular lines. ▪ Intersection of two lines. ▪ Length of perpendicular from a point on the line and perpendicular distance between parallel lines.	**05**	**10**
	3.3 CIRCLE ▪ Equation of circle in standard form, centre – radius formula and diameter formula. ▪ General equation of circle, its centre and radius, simple problem	**02**	**04**
	VECTOR ALGEBRA		
	4 VECTORS ▪ Definition of vector, position vector, Algebra of vectors (Equality, addition, subtraction and scalar multiplication) ▪ Dot (Scalar) product with properties. ▪ Vector (Cross) product with properties.	03	06
	4.4 Applications 4.4.1 Work done and moment of force/s about a point & line	**02**	04
	TOTAL:	42	80

LEARNING RESOURCES:

Sr. No.	Title	Authors	Publications
1	Mathematics for Class XI Volume I and II	R. D. Sharma	Dhanpat Rai Publication, New Delhi.
2	Mathematics for Class XII Volume and II	R. D. Sharma	Dhanpat Rai Publication, New Delhi.
3	Co ordinate Geometry	S. L. Loney	S. Chand Publication
4	Trigonometry	S. L. Loney	S. Chand Publication
5	Higher Algebra	H. S. Hall & S. R. Knight	Metric edition, Book Palace, New Delhi
6	Higher Sr. Secondary School Mathematics for XI & XII	R.S. Agrawal	Bharti Bhawan, Patna
7	Vector Algebra	L Prasad	Bharti Bhawan, Patna

Note:

In board examination, question setter may be advised to select 20% questions of objective, 30% of short type and remaining 50% of long type based on basic concepts, formula and calculations respectively.

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Course Name : 03 Years Diploma in Engineering

Semester   :   **First**

Subject Title : Engineering Physics-I

Subject Code : 103/ 107

Teaching and Examination Scheme:

Teaching Scheme			Examination					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03	1		100	80	20	26	40	3 Hrs
Practical		2	50	40	10	13	20	4 Hrs

NOTE:

Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

RATIONALE:

Basic science forms the foundation of Engineering. In particular Physics provides fundamental facts, principles, l aws, and proper sequence of events to streamline Engineering knowledge.

OBJECTIVES:

Student will be able to:

- Measure given dimensions by using appropriate instruments accurately.
- Select proper measuring instrument on the basis of range, least count & precision required for measurement.
- Differentiate kinetic and kinematics and solve the problems on kinematics and kinetics.
- Use principles of illumination for enhancing work efficiency.
- Analyze variation of sound intensity with respect to distance.
- Identify different factors affecting acoustical planning of buildings.
- Select proper material for intended purpose by studying properties of materials.
- Identify good & bad conductors of heat.
- Identify, analyze, discriminate and interpret logical sequence of field problems with the study of physics.

CONTENTS: Theory

CHAPTER	CONTENT	HOURS	MARKS
1.	**UNITS AND MEASUREMENTS** **1.1** Need of measurement and unit in engineering and science, definition of unit , requirements of standard unit, systems of units-CGS,MKS and SI, fundamental and derived quantities and their units **1.2** Definition of dimensions with examples, principle of homogeneity of dimensions, limitations of dimensions. **1.3** Definition of accuracy, precision and error, estimation of errors – absolute error, relative error and percentage error, rules and identification of significant figures. **(Numericals on percentage error and significant figures)**	**04**	**06**
2	**MECHANICS** **2.1 Motion along a straight line and Force** Concept of scalar and vector quantities, Equations of motion with constant acceleration (derivation not required), Equations of motion of falling body under gravity, Newton's laws of motion, Force, inertia, Action and reaction, tension, , momentum, impulse and impulsive force with practical examples (basic Idea), Conservation of linear momentum, **(Simple problems on linear motion)**	**04**	**10**
	2.2Angular Motion Definition of angular displacement, angular velocity and angular acceleration, relation between linear velocity and angular velocity, definition of simple harmonic motion (SHM), SHM as a projection of uniform circular motion on any diameter, equation of SHM, derivation of displacement, velocity and acceleration of a body executing SHM.	**05**	**08**
3	**GRAVITATION** Newton's laws of gravitation,Newton's gravitational constant (G) and its SI unit, Acceleration due to gravity (g) and its relation with "G",Variation of g with altitude and latitude(deduction not required) **(Simple problems)**	**03**	**06**
4.	**WORK , ENERGY & POWER** Definition of work, energy and power, equations for P.E. & K.E., Work-Energy principle, Representation of work by using graph, work done by a torque (no derivation) **(Numericals on work, potential and kinetic energy)**	**02**	**06**

			HOURS	MARKS
5.		**GENERAL PROPERTIES OF MATTER** **5.1 Elasticity** Deforming force, restoring force, elastic and plastic body, stress and strain with their types. elastic limit, Hooke's law, Young's modulus, bulk modulus, modulus of rigidity and relation between them (no derivation). **(Numerical on stress, strain and Young's modulus)**	04	08
		5.2 Surface Tension. Molecular force, cohesive and adhesive force, Molecular range , sphere of influence, Laplace's molecular theory, Definition of surface tension and its S.I. unit, angle of contact, capillary action with examples, shape of meniscus for water and mercury, relation between surface tension , capillary rise and radius of capillary (no derivation),effect of impurity and temperature on surface tension **(Numerical on relation between surface tension, capillary rise and radius)**	04	08
		5.3 Viscosity Definition of viscosity, viscous force, velocity gradient, Newton's law of viscosity, coefficient of viscosity and its S.I. unit, streamline and turbulent flow with examples, critical velocity, Reynolds's number and its significance, derivation of viscous force for free fall of spherical body through viscous medium, upthrust, terminal velocity, Stoke's law (statement and formula). **(Numerical on coefficient of viscosity, Reynolds number and Stoke's formula)**	04	08
CHAPTER		**CONTENT**	**HOURS**	**MARKS**
6		**HEAT** **Transmission of heat and expansion of solids:** Three modes of transmission of heat -conduction, convection and radiation, good and bad conductor of heat with examples, law of thermal conductivity, coefficient of thermal conductivity and its S.I. unit, Definition of linear, aerial and cubical expansion and relation between them. (no derivation) (Numericals on law of thermal conductivity, and coefficients of expansions)	04	08
7		**ACOUSTICS** **7.1 Sound** Definition of wave motion, amplitude, period, frequency, and wavelength, relation between velocity, frequency and wavelength , longitudinal and transverse wave, definition of stationary wave , node and antinode, forced and free vibrations, definition of resonance with examples, derivation of formula for velocity of sound with end correction. **(Numericals on relation** $v = n\lambda$ **and resonance)**	04	06

7.2 Acoustics of Building Acoustics-concept and definition, Intensity and loudness of sound, echo, Reverberation standard reverberation time, Sabine's formula, Conditions for good acoustics, Factors affecting Acoustical planning of auditorium. **(Numericals on Sabine's formula)**	**04**	**06**
	TOTAL	**42**	**80**

Practical:

Skills to be developed

1) **Intellectual skills-**
      Proper selection of measuring instruments on the basis of range, least count, precision and accuracy required for measurement.
      Analyze properties of matter & their use for the selection of material.
      To verify the principles, laws, using given instruments under different conditions.
      To read and interpret the graph.
      To interpret the results from observations and calculations.
      To use these results for parallel problems.

2) *Motor skills-*
      Proper handling of instruments.
      Measuring physical quantities accurately.
      To observe the phenomenon and to list the observations in proper tabular form.
      To adopt proper procedure while performing the experiment.
      To plot the graphs.

*L*ist of Experiments:

1. To know your Physics Laboratory.
2. To use Vernier Callipers for the measurement of dimensions of given object.
3. To use Micrometer Screw Gauge for the measurement of dimensions (Length, Thickness, Diameter) of given object.
4. To use spherometer for the measurement of thickness of a given glass piece.
5. To calculate Young's modulus of elasticity of steel wire by Vernier method
6. To study capillary phenomenon and to verify that the height of liquid in capillary is inversely proportional to the radius of capillary
7. To determine coefficient of viscosity of given liquid using Stoke's Method
8. To calculate the Linear Thermal coefficient of expansion for copper by using Pullinger's apparatus.
9. To determine refractive index of a glass using glass slab by pin method. (sin i/sin r=μ).
10. To determine the velocity of sound by using resonance tube.

Reference Books:

Sr. No.	Name of book	Author	Publisher & Address
1.	Physics-I	V. Rajendran	Tata McGraw- Hill raw- Hill publication, New Delhi
2.	Applied physics	Arthur Beiser	Tata McGraw- Hill raw- Hill Publication, New Delhi
3.	Engineering Physics	by R.K.Gaur and S.L.Gupta	Dhanpat Rai Publication, New Delhi.
4.	Fundamentals of Physics	Resnick ,Halliday & Walker	Wiley India Pvt. Ltd.
5.	Core Physics-I	A. Kumar	Bharti Bhavan
6.	Pradeep's Fundamental Physics-XI	K.L. Gomber & K.L Gogia	Pradeep Publication
7.	S. Chand's Principles of Physics-XI	V.K Mehta & Rohit Mehta	S. Chand Publication
8.	Dinesh New Millennium Physics-XI	S. K Sharma	Dinesh Publication

Course Name:- All Branches of Diploma in Engineering

Semester: First

Subject Title: Fundamental of

Computer Subject Code; 106/111

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
02	0		50	40	10	13	20	3 Hrs
Sessional		2	50	30	20		25	

NOTE:

Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

RATIONALE:

In Engineering Education role of computers and its knowledge is day by day increasing and every documentation and analysis requires basic fundamentals of computers. The accessibility to internet and presentation techniques are essential elements these days which is fully dependent on knowhow of computers irrespective of branches or discipline.

OBJECTIVES:

Student will be able to:

1. Understand a computer system that has hardware and software components, which controls and makes them useful.
2. Understand the operating system as the interface to the computer system.
3. Use the basic function of an operating system.
4. Set the parameter required for effective use of hardware combined with and Application software's.
5. Compare major OS like Linux and MS- Windows.
6. Use file managers, word processors, spreadsheets, presentation software's and Internet.
7. Have hands on experience on operating system and different application software.
8. Use the Internet to send mail and surf the World Wide Web.

CONTENTS : Theory

Chapter	Name of Topic	Hr	Marks
1.	**Fundamentals of Computer** 1.1 Introduction 1.2 Type of Computer 1.3 Components of PC 1.4 Inputs & Output Devices 1.5 Computer Languages 1.6 Memory of Computer	4	6
2.	**Introduction to MS Office** 3.1 MS- Word : Introduction, Starting MS-Word Screen and its Components, Elementary Working with MS-Word 3.2 MS- Excel: Introduction, Starting MS-Excel, Basics of Spreadsheet, MS- Excel Screen and its Components, Elementary Working with MS-Excel. 3.3 MS –Power Point: Introduction, Starting MS-PowerPoint, Basics of PowerPoint, MS-PowerPoint Screen and Its Components, Elementary Working with MS-PowerPoint.	8	12
3.	**Introduction to Internet** 4.1 What is Internet? 4.2 Computer Communication and Internet. 4.3 WWW and Web Browsers. 4.4 Creating own Email Account. 4.5 Networking and types.	4	6
4.	**Introduction to HTML and Software** 5.1 Introduction to HTML. Working of HTML 5.2 Creating and loading HTML pages, tags. 5.3 Structure of on HTML, Document, Stand Alone Tags. 5.4 Formatting text, Adding Images, Creating hyper Links, Tables. 5.6 Cyber security. 5.7 Computer virus.	8	10
5.	**Information Technology** 6.1 Current IT Tools. 6.2 Social networking, mobile computing, cloud computing. 6.3 Introduction of IOT and IOE 6.4 Computer Application in various fields like Data analysis, database management, artificial intelligence.	6	6
	Total	30	40

List of Practical Exp- 1

Identification of different part of computer system and peripherals

Exp – 2: Operations on operating system

1. Create a new folder and do the following:
    a. Make a new folder in it.
    b. Rename the initial folder.
    c. Opening a new file.
    d. Creating document in note pad.
    e. Move the initial folder.
    f. Copy the initial folder.
    g. Delete the initial folder
2. Implement the various well known features of Windows operating system such as Notepad, WordPad, Calculator, System tools etc. enclosed in Start→Programs→Accessories.
3. Implement various display properties by right clicking on the Windows Desktop.
4. Explore the taskbar of Windows.
5. Set the wall paper and screen saver.
6. Set the date /time.

Exp.3 Basic operations on MS Word

1. Create a document and
    a. Put Bullets and Numbers
    b. Apply various Font parameters.
    c. Apply Left, Right, and Centre alignments
    d. Apply Hyperlinks
    e. Insert pictures
    f. Insert ClipArt
    g. Show the use of Word Art
    h. Add Borders and shading
    i. Show the use of Find and Replace.
    j. Apply header/footers

Exp- 4 Advance operations on MS Word

2. Create any document and show the use of File→Versions.
3. Create any document and show the difference between paste and paste special.
4. Create any document and show the use of Washout/Watermark.
5. Implement the concept of mail merge.
6. Implement the concept of macros.
7. Implement the concept of importing a file/document.
8. Implement the concept of merging the documents.
9. Create a student table and do the following :
a. Insert new row and fill data
b. Delete any existing row.
c. Resize rows and columns.
d. Apply merging/ splitting of cells
e. Apply sort.
f. Apply various arithmetic and logical formulas.
g. Apply various arithmetic and logical formulas.
10. Create your resume using General Templates.

Exp- 5 Basic operation on electronic spreadsheet/excel

1. Computer the division of each and every student of a class.
2. Generation of Electricity Bill
3. Generation of Telephone Bill
4. Generation of Salary statement of an employee
5. Generation of Mark Sheet of a student.
6. To compute mean / median / mode.
7. Generation graph to show the production of goods in a company during the last five years.
8. Compare the cost, overheads and sales figure of a company for last three years through appropriate chart.

Exp – 6 Advance operations on electronic spreadsheet

1. Generation the following worksheet

Roll No.	Marks
2050	67
2051	49
2052	40
2053	74
2054	61
2055	57
2056	45

and do the following:

   a.   Create chart of the marks.
   b.   Compute sum of marks using auto sum, auto calculate and sum function.
   c.   Compute average of marks.
   d.   Show pass or fail if marks are above 50 or less than 50
   e.   Put header and footer in the spread sheet.

Importing and exporting data from other files.

Program development in excel using simple commands.

Exp – 7 Power Point Presentation preparation

   1.   Make a presentation of College Education System using
         a.   Blank Presentation
         b.   From Design Template
         c.   From Auto Content Wizard

Exp – 8 Animation and various effect in Power Point Presentation, exporting and importing contents from word/excel

1. Make a presentation on "Wild Life " and apply the following:
         a.   Add audio and video effects
         b.   Apply various Color Schemes
         c.   Apply various animation schemes.
         d.   Apply slide show

Exp – 9 Simple program in HTML

1. Create any webpage using following HTML tags:
         a.   Background Colour
         b.   Font (Colour, Size, Face)
         c.   Bold / Italic / Underline
         d.   Big / Small
         e.   H 1, H 2, etc.
         f.   Marquee
         g.   Ordered / Unordered List
         h.   Data list
2.   Create Employee Table and apply various operations on it using HTML. Also put Border around the table.
3.   Create Internal and External Hyperlinks in a Webpage.
4.   Implement the concept of Frames in a Webpage.
5.   Insert an image in a Webpage.
6.   Design Home page of your Institute
7.   Design Web page for tourism spots in your area
8.   Prepare your CV and link on the web page
9.   Use animation of image in a web page
10. Insert a table and perform table handling in web page

Exp – 10 Basics of Internet, surfing, email account opening and transactions through email account

1. Connect the Internet; open any website of your choice and save the Web Pages.
2. Search any topic related to your syllabus using any search engine and download the relevant material.
3. Create your E-Mail ID on any free E-Mail Server.
4. Login your E-Mail ID and do the following:
a. Read your mail
b. Compose a new Mail
c. Send the Mail to one person
d. Send the same Mail to various persons
e. Forward the Mail
f. Delete the Mail
g. Send file as attachment
5. Surf Internet using Google to find information about yours state college.
6. Surf Internet using Google to find Tourism information about your state.
7. Surf Internet using Yahoo to find Hotel around your state

Text Books:

i) C.S. French "Data processing and Information Technology ", BPB Publications.
ii) P.K Sinha Computer Fundamentals , BPB Publications
iii) Guy Hart-Davis "The ABCs of Microsoft Office Professional Edition", BPB Publication.
iv) Karl Schwartz, "Microsoft Windows 98 Training Guide"

Course Name : 03 Years Diploma in Engineering

Semester : First

Subject Title : Workshop-I

Subject Code : 112

Teaching and Examination Scheme:

Teaching Scheme			Examination					
L T H	T	P	Full Marks .	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
01		4	50	30	20	--	25	---

Rationale:

Engineering diploma technician is expected to know basic workshop practice. like Wood working, Sheet metal. The students are required to identify, operate, control various machines, select and use various tools and equipments related to Wood working and sheet metal processes together with exposure to fabrication soldering and joint making of various types.

Objectives:

The student will able to

- Know basic workshop processes.
- Read and interpret job drawing.
- Identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.
- Operate, control different machines and equipments.
- Inspect the job for specified dimensions
- Produce jobs as per specified dimensions.
- Adopt safety practices while working on various machines.

CONTENTS:

Sr.No.	Details Of Theory Contents	Jobs	Theory (hr)	Practice(hr)

01	**CARPENTRY SHOP**
	1. Introduction.
	2. Various types of woods.
	3. Different types of tools, machines and accessories.
	4. Practice Job
	  a. Preparation of cross lap joints.
	  b. T Lap joints
	  c. Dovetail Joints
	  d. Wood turning
		04	04	**14**

02	**FITTING SHOP**: 1. Introduction 2. Various marking, measuring, cutting, holding and striking tools. 3. Different fitting operation like chipping, filing, right angle, marking, drilling, tapping etc. 4. Working Principle of Drilling machine, Tapping dies its use. 5. Safety precautions and safety equipments. 6. Practice 3 Jobs (V groove, Square notch, Fitting of two parts)	03	03	12
03	**SHEET METAL SHOP.** 1. Introduction 2. Various types of tools, equipments and accessories. 3. Different types of operations in sheet metal shop. 4. Soldering and riveting. 5. Safety precautions 6. Practice Jobs (Making funnel, tray, cylinder)	03	03	14
04	**TURNING SHOP** 1. Introduction 2. Various marking, measuring, cutting, holding and striking tools. 3. Working Principle of Drilling machine, Tapping dies its use. 4. Drilling and Tapping 5. Turning: Plain, taper 6. Threading and Knurling 7. Safety precautions and safety equipments.	**03**	**04**	**16**
	Total	13	14	56

Skill to be developed:

Intellectual Skills:
1. Ability to read job drawing
2. Ability to identify and select proper material, tools, equipments and machine.
3. Ability to select proper parameters (like cutting speed, feed, depth cut use of lubricants)

Motor Skills:

1. Ability to set tools, work piece, and machines for desired operations.
2. Ability to complete job as per job drawing in allotted time.
3. Ability to use safety equipment and follow safety procedures during operations.

4. Ability to inspect the job for confirming desired dimensions and shape.
5. Ability to acquire hands-on experience.

Notes: 1] The Faculty/ Instructor shall give demonstration to the students by preparing a specimen job as per the job drawing.
  2] The workshop diary shall be maintained by each student duly signed by Faculty/Instructor of respective shop

Books:

- S.K. Hajara Chaudhary- Workshop Technology-Media Promotors and Publishers, New Delhi

- B.S. Raghuwanshi- Workshop Technology- Dhanpat Rai and sons, New Delhi

- R K Jain- Production Technology- Khanna Publishers, New Delhi

- H.S.Bawa- Workshop Technology- Tata McGraw Hill Publishers,New Delhi

- Kent's Mechanical Engineering Hand book- John Wiley and Sons, New York

- Electronics Trade & technology Development Corporation.(A

  Govt. of India undertaking) Akbar Hotel Annex, Chanakyapuri,

  New Delhi- 110 021

  Learning Materials Transparencies, CBT Packages developed by N.I.T.T.E.R. Bhopal

Scheme of Teaching and Examination for

2nd Semester of 3 Years Diploma in Engineering (All Branches except Non Tech)

Duration of Semester   **:** **14 Weeks**
Student Contact Hours   **:** **36 Hrs** Total
Marks   **:** **800**

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Communication Skill – II	201	Theory	3	-	-	3	100	80	20	26	40
2.	Engineering Math – II	202	Theory	3	1	-	3	100	80	20	26	40
3.	Engineering Physics - II	203	Theory	3	-	-	3	100	80	20	26	40
4.	Engineering Chemistry - II	204	Theory	3	-	-	3	100	80	20	26	40
5.	Programming in C	205	Theory	3	-	-	3	100	80	20	26	40
6.	Engineering Physics II	206	Practical	-	-	2	3	50	40	10	13	20
7.	Engineering Chemistry II	207	Practical	-	-	2	3	50	40	10	13	20
8.	Programming in C	208	Sessional	-	-	4	3	50	30	20	-	25
9.	Workshop Practices	209	Sessional	-	-	4	4	100	60	40	-	50
10.	Professional Practice I	210	Sessional	-	-	4	-	50	30	20	-	25
	Total Hours of Teaching per week :			**15**	**1**	**16**						

Total Marks :   Theory   :   Practical   :   Sessional   :
                     L   :   Lecture,   T   :   Tutorial   P   :   Practical

Note: 1. Period of Class hours should be of 1 hrs duration as per AICTE norms.

2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.

3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.

4. Board will depute examiner for Practical examination.

5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

Course Name : All Branches of Diploma Engineering

Semester   : Second

Subject Title : Communication

Skills Subject Code : 201

Teaching and Examination Scheme:

Teaching Scheme			Examination					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03	1		100	80	20	26	40	3 Hrs

NOTE:
Internal marks will be allotted on the basis of two snap tests and 2 assignment of
equal marks to be conducted by the faculty teaching the subject.

Rationale:

The Students have been already been exposed to the Language Skills pertaining
to English, leading to a better understanding of English & use of grammar,
developing a base for the language. Now with a view to achieve some mastery
over the language & to develop Communication Skills, which is the main
objective of this subject, the basic concepts of communication, Non-verbal and
written skills have been Introduced.

Objectives:
The Students will be able to:

1) Understand and use the basic concepts of communication and
   principles of effective communication in an organized set up
   and social context.

2) Give a positive feedback in various situations, to use appropriate
   body language & to avoid barriers for effective communication.

3) Write the various types of letters, reports and office drafting with
   the appropriate format.

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Introduction to communication:** 1.1 Definition, communication cycle., 1.2 The elements of Communication: sender- message – channel- Receiver –Feedback. 1.3 Concept of Communication Process. 1.4 Stages in the process: defining the context, knowing the audience, designing the message, encoding, selecting proper channels, transmitting, receiving, decoding and giving feedback. (Case lets.)	04	08
02	**Types of communication** 2.1 Formal Communication. 2.2 Formal: Types – a) Vertical Communication. b) Horizontal Communication. 2.3 Informal: Types – a) Diagonal Communication. 2.4 Verbal Vs Non-Verbal Communication. 2.5 Verbal: Types-a) Oral Communication. b) Written Communication. 2.6 Non-Verbal: Types- a) Body Language. b) Graphic Language.	06	10
03	**Principles of Effective Communication :** 3.1 Principles of Effective Communication. (One example each.) 3.2 Communication barriers & how to overcome them. 3.3 Developing effective messages: Thinking about purpose, knowing the audience, structuring the message, selecting proper channels, minimizing barriers & facilitating feedback. (Examples: Writing articles for newspapers, magazines.)	04	08
04	**Non verbal- graphic communication**: 4.1 Non- verbal codes: A- Kinesecs , B- Proxemics , C – Haptics D-Vocalics , E- Physical appearance. F -Chronemics , G –Artifacts. (One example each.) 4.2 Aspects of Body Language. Types of Body Language. (One example each.) 4.3 Interpreting visuals & illustrating with visuals like tables, charts & graphs.	06	12

			10	20
05	**Formal written skills :** 5.1 Office Drafting: Circular, Notice, and Memo. 5.2 Job Application with resume. 5.3 Business correspondence: Enquiry, Order letter, Complaint letter, and Adjustment letter. 5.4 Report writing: Accident report, Fall in production, Progress Report,, Investigation Report. 5.5 Defining, Describing Objects &Giving Instructions. 5.5.1 Defining Objects- Appearance, It's Use. 5.5.2 Describing Objects- Purpose, Components, Functions, Applications. 5.5.3 Giving Instructions- Precise, Directive, Imagistic Statements of a futuristic stance.			

			12	22
06	**Oral Skills :** 6.1 Phonetics and Phonology - Introduction - Phonetics symbols - Consonants/vowels/Dipthongs - Stress and Intonation 6.2 Discussion Skills - Importance of group discussion - Leadership skills - Team management 6.3 Presentation Skills - Importance of presentation - Planning of presentation - Handling stage fright 6.4 Mock Interview - The Interview process - Pre-Interview preparation - Answering strategies			
		Total	**42**	**80**

Assignments:

1. Communication Cycle (With the Help of Diagram) + Any two communication situations to be represented with the help of Communication Cycle. (Use Pictures)

2. Communication Situations (List of 5 Communication situations stating the type of communication viz; Vertical, Horizontal, Diagonal.

3. Barriers That Hinder a Particular Communication Situation. (State the type of barrier, and how to overcome them). (04 Caselets)

4. Writing articles (two) in keeping with the parameters of developing effective messages. (Collect samples from newspapers, articles, Internet and pate them in the assignment.)

5. Business Letters: a) Job Application with

                       Resume. b) Enquiry Letter.

                       c) Order Letter.

                       d) Complaint Letter.

6. Non-Verbal Communication:

  a) Body Language: Five Illustrations of appropriate use of Body

  Language used on the part of student in formal and Informal setups.

  (Example- formal setup- classroom

  b) Graphic Language: Five Illustrations of the use of Signs, Symbols,

  Colours, Maps, Graphs, Charts in day to day life.

7. Presentation Skills: Select topic (current issues) and ask students to give

    a class presentation as per the principles of effective communication and

    paste these topics as an

Non-Verbal Codes: Kinesics, Physical Appearance, Haptics. (Collect five pictures per group of five students on the above mentioned non-verbal codes, analyse and discuss them in the class. Ask the students to paste these pictures along with explanation in their individual files.

GUIDELINES: Teachers can make use of group discussions, class presentations, role plays, simulations, caselets, listen and repeat drills with the help of cassettes etc to give a hand on experience for students.

Students should maintain the Institute Files to write all the eight assignments with aprper Index and get it duly certified.

Books:

Sr. No.	Author	Title	Publisher
01	SBTE, Mumbai.	Text book of Communication Skills.	SBTE, Mumbai.
02	M.Ashraf Rizvi	Effective Technical Communication	Tata McGraw Hill Companies.
03	Krushna Mohan, Meera Banerji	Developing Communication Skills	Macmillan
04	Joyeeta Bhattacharya	Communication Skills.	Reliable Series
05	Jayakaran	Every ones guide to effective writing.	Apple Publishing.
06	Website: www.mindtools.com/page8.html-99k		
07	Website: www.khake.com/page66htm/-72k		
08	Website: www.BM Consultant India.Com		
09	Website: www.letstak.co.in		
10	Website: www.inc.com/guides/growth/23032.html-45k		

Course Name : 03 Years Diploma Engineering

Semester : **Second**

Subject Title : Engineering

Chemistry-II Subject Code : 204 / 207

Teaching and Examination Scheme:

Teaching Scheme			Examination					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03			100	80	20	26	40	3 Hrs
Practical		2	50	40	10	13	20	4 Hrs

NOTE:

Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

RATIONALE:

This syllabus of chemistry of 2ND semester for all the branches of Diploma Engineering has been given the name "Engineering Chemistry". In this it is intended to make students learn about the Engineering Materials and their appropriate uses, Lubrication process and protection of machines in different working environments, quality of water and its treatment as per the requirement, corrosion and its control by various methods.

OBEJECTIVE:

The student will be able to:

1. Suggest the appropriate use of metals, alloys and non-metallic material in engineering.
2. Knowledge of corrosion of metal and control methods.
3. Knowledge of choosing suitable lubricants for smooth running machines.
4. Implementing the knowledge and utilization of water and water treatment to serve the requisites of a particular use.

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
1.	**Electrochemistry:** Conductivity of Electrolytes – Concept of Ohms Law, Specific Conductance, Specific Resistance, Equivalent Conductivity & Molar Conductance, Variation of Specific, Molar and Equivalent Conductance with dilution. Concept of: Cell Constant, PH, POH and Buffer solution. Numerical based on PH and POH. Application of PH and Buffer solution.	04	08
2.	<u>**Metals and Alloys**</u> **2.1 Metals:** Definition of Metallurgy, Brief introduction of the terms involved in metallurgy. <u>Metallurgy of Iron</u>: Resources of Fe, Important Ores of Iron, Extraction process, Smelting in Blast Furnace, Chemical Reactions in Blast Furnace. Composition of Pig Iron. Engineering applications of Pig Iron, Cast Iron, wrought Iron or Malleable Iron. <u>Metallurgy of Copper</u>: Important ores of Copper, Extraction of Copper from chief ore. Engineering properties of Copper and applications. <u>Metallurgy of Aluminium</u>: Important Ores of Aluminium, Extraction of Aluminium from Alumina by Electrolytic Reduction Process, Electrolytic Refining of Aluminium, Engineering Properties of Aluminium & Uses. **2.2 Alloys:** <u>**Ferrous Alloys**</u> Various methods of steel making, Composition, Properties &Applications of Plain Carbon Steel (Low Carbon, medium Carbon, High Carbon & Very Hard Steel) & Effect of Various Alloying Elements (Cr, W, V, Ni, Mn, Mo, Si) etc. on Steel. **Non-Ferrous Alloys:** <u>Copper Alloys</u>–Brass, Bronze, Nickel Silver or German Silver, their Composition, Properties & Applications. <u>Aluminium Alloys</u> – Duralumin, Magnalium, their Composition, Properties & Applications <u>Other Alloys</u>: Definition, Compositions, Properties &Applications of Soft Solder, Tinmann's Solder, Brazing Alloy, Plumber's Solder, Rose Metal.	12	24

3	**Non-Metallic Engineering Matrerial** **3.1 Ceramics:** Definition, Properties & Engineering Applications, Types – Structural Ceramics, Facing Material, Refractories, Fine Ceramics, Special Ceramics. **3.2 Refractories:**	06	12

	Definition, Properties, Applications & Uses of Fire Clay Bricks, Silica Bricks and Masonry Bricks. **3.3 Composite Materials:** Definition, Properties, Advantages, Applications & Examples. **3.4 Adhesives:(Marks 4)** Definition, Characteristics, Advantages of adhesives, examples such as phenol-formaldehyde resin, urea formaldehyde resin, epoxy resin- their properties and applications as an adhesives.		
4	**Water:** Characteristics, Sources, Impurities, Hard & Soft Water, Causes of Hardness, Types of Hardness, Degree of Hardness, Boiler and Steam Generation, Scale & Sludge Formation – Causes, Disadvantage, Softening Methods such as Boiling, Clark's, Soda Ash, Lime Soda, Zeolite & Ion Exchange Methods with Principle Chemical Reactions. Plumbo solvency & its Removal. Numerical Problems.	5	10
5	**Corrosion:** Definition of Corrosion, Types of Corrosion (Dry and Wet chemical Corrosion) and their mechanism. Protection of metal from corrosion (Corrosion Control). Application of Protective Coatings like metal coating such as Galvanising, Tinning, Metal Spraying, Sherardizing, Electroplating and Metal Cladding. **Paints & Varnishes:** **Paints** Definition, Characteristics of Good Paint, Constituents & their functions & Examples, Methods of Applications. Introduction to Chemical Resistant Paints, Heat Resistance Paint, Cellulose Paint, Luminous Paints, Emulsion Paints, Metal Paints, Cement Paints, Water Paint or Distempers. **Varnishes:** Definition, Characteristics, Constituents, Types, Composition, Properties & Application of Japans, Enamels, Lacquers.	09	16

6	**Lubricant and Lubrication:** Lubricant – Definition, Classification with examples. Functions of lubricant, Lubrication – Mechanism of Lubrication (Fluid Film, Boundary and Extreme Pressure). Physical Characteristics of Lubricants Such as Viscosity, Viscosity Index, Oiliness, Volatility, Flash & Fire Point, and Cloud& Pour Point, Chemical Characteristics such as Acid Value or Neutralization Number, Emulsification, Saponification Value, Selection of Lubricants, Characteristics of Transformer oil.	06	10
	Total	**42**	**80**

List of Practical:

1	To determine neutralization point of Fatty Acid and ammonium hydroxide. Calculate normality and strength of Fatty Acids.
2	To determine the equivalent conductivity of precipitation of $BaCl_2$ with H_2SO_4 by titrating method. Also find the normality and strength of $BaCl_2$ Solution.
3	To verify Faraday's second law of electrolysis.
4	To determine PH of given solution by universal indicator and PH meter.
5	To determine the strength of given hydrochloric acid solution by titrating it against sodium hydroxide solution by using PH meter.
6	To determine thinner content in Oil paint.
7	To determine the flash and fire point of a given sample of lubricating oil.
8	To prepare Phenol formaldehyde resin (Backelite)
9	To determine viscosity of given lubricating oil.
10	To determine the alkalinity of given sample of water to decide the suitability of water for use in industry, steam generation, etc.
11	To determine degree of hardness of water by EDTA method to find the suitability of water in industrial and domestic use.
12	Study of fire clay bricks and furnaces.

Learning Resources Books:

Sl. No	Authors	Nameofthebook	Publisher
1	Jain& Jain	Engineering Chemistry	Dhanpat Raiand Sons
2	S.S. Dara	Engineering Chemistry	S. Chand Publication
3	B. K.Sharma	Industrial Chemistry	Goel Publication
4	S.S.Dara	Environmental Chemistry &Pollution Control	S. Chand Publication
5	Vedprakash Mehta	Polytechnic chemistry	Jain Brothers

Course Name : 03 Years Diploma in Engineering

Semester   : Second

Subject Title : Engineering Mathematics-II

Subject Code : 202

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
L TH	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03	01		100	80	20	26	40	3 Hrs

NOTE:

Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

Rationale:

The subject is extension of Engineering Mathematics - 1 of First Semester and stepping into the prerequisites to learn Applied Mathematics applicable in engineering solutions. Engineering Mathematics lay down the foundation to understand and express principles and laws involved in other technological subjects. The study of Engineering Mathematics will help to develop the skills essential for new emerging avenues.

Objective:

The student will be able to acquire knowledge of mathematical terms, concepts and principles. They can acquire sufficient mathematical techniques and can develop the ability to apply mathematical methods to solve technical and day to day practical problems.

Sub Objective:

This course is divided into five units. After completion of this course one could become able to learn the following.

1.   Intuitive meaning of Function, Limit and Continuity for solving the problems

2.   Differentiation and its meaning in engineering situations

3.   Applications of the Differentiation

Contents: Theory

Chapter	Name of the Topic	Hour s	Marks

01	**1. Function, Limit and Continuity**
	
	1.1 Function
	  ▪ Definition of variable, constant, intervals and their type
	  ▪ Definition of Function, value of a function and types of functions, Simple Examples
	  ▪ Definition of sinh x, cosh x and tanh x and some hyperbolic identities
	
	1.2 Use the concepts of Limit for solving the problems
	
	  ▪ Explain the concept of limit and intuitive meaning of $\lim_{x \to a} f(x) = l$ and its properties.
	  ▪ Derive the Standard limits $\lim_{x \to a} \dfrac{x^n - a^n}{x - a}$, $\lim_{x \to 0} \dfrac{\sin x}{x}$, $\lim_{x \to 0} Cosx$, $\lim_{x \to 0} \dfrac{\tan x}{x}$, $\lim_{x \to 0} \dfrac{a^x - 1}{x}$, $\lim_{x \to 0} \dfrac{e^x - 1}{x}$, $\lim_{x \to 0} (1 + x)^{\frac{1}{x}}$, $\lim_{x \to \infty} \left(1 + \dfrac{1}{x}\right)^x$ with simple example.
	  ▪ Evaluate the limits of the type $\lim_{x \to \infty} \dfrac{f(x)}{g(x)}$.
	  ▪ Explain the Concept of continuity of a function at a point and in interval with some examples whether a given function is continuous or not.
		06	12

2. Differentiation and its meaning in engineering situations

- Concept of derivative of a function $y = f(x)$ from the first principle as
$$\lim_{h \to 0} \frac{f(x+h) - f(x)}{h} \text{ and}$$
Standard notations to denote the derivative of a function.

- Derivatives of elementary functions like x^n, a^x, e^x, log x, sin x, cos x, tanx, secx, cosecx, cot x and Invise Trigonometrical function using the first principles.

- Rules for differentiation of sum, difference, scalar multiplication, product and quotient of functions with illustrative and simple examples.

- Differentiation of a function of a function (Chain rule) with illustrative examples such as

(i) $\sqrt{t^2 + \dfrac{2}{t}}$ (ii) $x^2 \sin 2x$

(iii) $\dfrac{x}{\sqrt{x^2 + 1}}$ (iv) $\log(\sin(\cos x))$.etc

- Differentiation of a function with respect to another function and also differentiation of parametric functions with examples.

- Derivatives of some simple hyperbolic functions (without Proof).

- Differentiation of implicit function with examples.

- Logarithmic differentiation of some functions with examples like $[f(x)]^{g(x)}$.

- Concept of higher order derivatives (second and third order) with examples.
- Concept of functions of several variables, partial derivatives and difference between the ordinary and partial derivatives with simple examples.

12	24

	3. Applications of the Differentiation
	3.1 Geometrical Applications of Derivatives
	  ▪ State the Geometrical meaning of the derivative as the slope of the tangent to the curve $y=f(x)$ at any point on the curve.
	  ▪ Equation of tangent and normal to the curve $y=f(x)$ at any point on it.
	▪ The concept of angle between two curves and procedure for finding the Angle between two given curves with illustrative examples.
	3.2 Use of Derivatives to find extreme values of functions
	  ▪ The concept and condition of increasing and decreasing functions with illustrative examples.
	  ▪ Find the extreme values (maxima or minima) of a function of single variable - simple problems yielding maxima and minima.
	3.3 Concept of Derivatives as Rate Measure with illustraribe examples.
	3.4 Concept of Derivatives to find Radius of Curvature with illustraribe examples.
		14	**24**

	4. Statistics
	  ▪ Measures of Central tendency (mean, median, mode) for ungrouped and grouped frequency distribution.
	
	  ▪ Graphical representation (Histogram and Ogive Curves) to find mode and median
	
	  ▪ Measures of Dispersion such as range, mean deviation, Standard Deviation, Variance and coefficient of variation. Comparison of two sets of observations.
		04	**08**

	5. Complex Number.
	
	  ▪ Represent the complex number in various forms like modulus-amplitude, polar form, Exponential (Euler) form – illustrate with examples
	  ▪ Modulus, Conjugate and Argument of Complex Number and their properties.
	  ▪ Operations on complex numbers (Equality, Addition, Subtraction, Multiplication and Division) with examples.
	  ▪ Square root of complex number
	  ▪ Cube roots of units and their properties, simple problems based on them.
	  ▪ De-Moivre's theorem (without proof) and simple problems.
		6	**12**

	Total	**42**	**80**

Tutorial: Tutorials are to be used to get enough practice for solving problems. It is suggested that in each tutorial at least five problems should be solved.

Learning Resources:

Books:

Sr. No	Title	Authors	Publications
1	Mathematics: A Textbook for Class XI Part I & II	National Council of Educational Research and Training	
2	Mathematics: A Textbook for Class XII Part I & II	National Council of Educational Research and Training	
3	Mathematics for Class XI Volume I and II	R. D. Sharma	Dhanpat Rai Publication, New Delhi.
4	Mathematics for Class XII Volume I and II	R. D. Sharma	Dhanpat Rai Publication, New Delhi.
5	Higher Engineering Mathematics	B.S Grewal	Khanna Publication, New Delhi
6	Higher Sr. Secondary School Mathematics for XI & XII	R.S. Agrawal	Bharti Bhawan, Patna

Note:

In board examination, question setter may be advised to select 20% questions of objective, 30% of short type and remaining 50% of long type based on basic concepts, formula and calculations respectively.

Course Name : 03 Years Diploma Engineering

Semester : Second

Subject Title : Engineering Physics-II

Subject Code : 203/ 206

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03			100	80	20	26	40	3 Hrs
Practical		2	50	40	10	13	20	4 Hrs

NOTE:

Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

RATIONALE:

Basic science forms the foundation of Engineering. In particular Physics provides fundamental facts, principles, l aws, and proper sequence of events to streamline Engineering knowledge.

Objectives : The Student will be able to :

1. Analyze the basic properties of light.
2. Differentiate between field intensity and potential.
3. List the advantages of optical fibre.
4. Describe principal of working of optical fibre.
5. Differentiate between conductor, Insulator and semi conductor on the basis of band theory.
6. Know simple idea of Nano Technology.
7. Know simple idea of non conventional sources of energy.

Contents : Theory

Chapter	Name of the Topic	Hours	Marks
1.	**LIGHT** **Properties of light** Reflection, refraction, Snell's law, physical significance of refractive index, definition of dispersion of light along with ray diagram. **(Numericals on refractive index)**	**03**	**06**
2.	**Electric Field and Potential** **2.1 Electric field** Electric charge, Coulomb's inverse square law, Definition of unit charge, Electric field, Electric lines of force and their properties, Elect field intensity, Electric flux, Electric flux density. **(Numericals on Coulombs law, Electrical Intensity)**	05	08
	2.2 Electric Potential Concept of potential, Definition and unit, Potential due to point charge using integration method, Potential difference between two points, Definition of dielectric strength and breakdown potential. **(Numericals on electric potential)**	05	08
	2.3 Capacity & Condensers Electrostatics capacity & its S.I unit, Capacity of parallel plate condenser, Condensers in series & parallel (Formula only,no derivation), Uses of condensers. **(Simple problems)**	03	06
3	**CURRENT ELECTRICITY** Ohm's law, Resistance and its unit, Specific resistance, Factors affecting resistance, Kirchhoff's law and its application to Wheat stone bridge circuit.	03	08
4	**Fiber Optics** Introduction, Total internal reflection, critical angle, acceptance angle. Structure of optical fiber, Numerical Aperture, Fiber optic materials, Types of optical fibers, Applications in communication systems. **(Numerical on critical angle, numerical aperture)**	05	08
5	**Band Theory of Solids** Energy levels in solids, Valence & conduction bands, forbidden gap, Conductors, Semiconductors and Insulators,	05	08

	Intrinsic and Extrinsic Semiconductors, p-type and n-type semiconductors, P-N junction diode-forward and reversed biased characteristics.		
˅	**MODERN PHYSICS.** **7.1 Photo electricity** Concept of photon, Plank's hypothesis, properties of photon, photo electric effect, Laws of photoelectric effect, work function, Einstein's photoelectric equation(no derivation), Basic Concept of Solar Energy. **(Numericals on Energy of photon, work function, photoelectric equation)**	03	06
	7.2 LASER Properties of laser, Characteristics and applications of Laser	01	04
	7.3 X-rays Introduction to X-rays, production of X-rays using Coolidge tube, minimum wavelength of X-rays, properties and applications. of X-rays **(Numericals on minimum wavelength of x-rays)**	02	06
7	**Introduction to nanotechnology** Definition of nanoscale, nanometer & nanoparticle, applications of nanotechnology- electronics, automobiles, medical, textile, cosmetics, environmental, space and defence.	03	06
8	**Non- Conventional Sources of energy** Introduction- Non Renewable and renewable (Alternate) energy sources, Examples- Solar Energy, Wind Energy, Tidal Energy, Geo-Thermal Energy and Bio-Mass. Advantages and disadvantages of renewable energy.	04	06
	Total	**42**	**80**

Practical :

Skills to be Developed : Intellectual Skills :
- Proper selection of measuring instruments on the basis of range, least count, precision and accuracy required for measurement.
- To verify the principles, laws, using given instruments under different conditions.
- To read and interpret the graph.
- To interpret the results from observations and calculations.
- To use these results for parallel problems.

Motor Skill :

- Proper handling of instruments.
- Measuring physical quantities accurately.
- To observe the phenomenon and to list the observations in proper tabular form.
- To adopt proper procedure while performing the experiment.

List of Experiment :

1. To represent simple harmonic motion with the help of vertical oscillation of spring to determine spring constant (K) (Stiffness Constant).
2. To determine time period of oscillation of compound bar pendulum and calculate acceleration due to gravity (g).
3. To calculate refractive index of material of prism using spectrometer device.
4. To determine effective capacitance of series and parallel combination of capacitors by calculating its reactance.
5. Verification of Ohm's Law.
6. To convert galvanometer into ammeter of required range using appropriate value of shunt.
7. To verify Total Internal Reflection (TIR) phenomenon for given glass slab and to calculate critical angle of incidence.
8. Determination of Energy Gap (Forbidden Gap) of a semi-conductor.
9. To determine I-V characteristics of P-N junction Diode.
10. To verify inverse square law by using photoelectric cell.

Learning Resources:

Sr. No.	Author	Title	Publisher
01.	Arthur Beiser	Applied physics	Tata McGraw-Hill
02.	R.K.Gaur and S.L.Gupta	Engineering Physics	Dhanpatrai and Sons.
03.	Rensic and Halliday	Physics	Wiley publication
04.	Dr. S.K. Kulkarni	Nanotechnology-Principles and practices	Capital publishing company
05.	S.K.Gupta	ABC of Physics	Modern Publisher New Delhi
06.	A.S. Vasudeva	Senior Practical Physics	S.K.Kataria & Sons.
07.	Core Physics-II	A. Kumar	Bharti Bhavan
08.	Pradeep's Fundamental Physics-XII	K.L. Gomber & K.L Gogia	Pradeep Publication
09.	S. Chand's Principles of Physics-XII	V.K Mehta & Rohit Mehta	S. Chand Publication
10.	Dinesh New Millennium Physics-XII	S. K Sharma	Dinesh Publication

Course Name : 03 Years Diploma in Engineering

Semester : Second

Subject Title : Professional Practice-I

Subject Code : 210

Teaching and Examination Scheme:

Teaching Scheme			Examination					
L TH	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External
			50	30	20	---	25	---

Rationale:

Most of the diploma holders are employed in industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion. These are planned in the semester so that there will be increased participation of students in learning process.

Objectives:

Student will be able to:

1. Acquire information from different sources.
2. Prepare notes for given topic.
3. Present given topic in a seminar.
4. Interact with peers to share thoughts.
5. Prepare a report on industrial visit, expert lecture.

Sr. No.	Activity
1	**Industrial Visits:** Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form part of the term work. Visits to any two of the following : i) Construction site for residential / Public building. ii) Petrol Pump iii) Media Center iv) Small Scale industry. v) Domestic Appliances repair centre vi) Visit public utility place
2	**Lectures by Professional / Industrial Expert to be organized on any three topics of the following suggested areas or any other suitable topics:** i) Pollution control. ii) Fire hazards due to short circuits iii) Fire Fighting / Safety Precautions and First aids. iv) Vedic Mathematics and Abacus. v) Topics related to Social Awareness such as –Traffic Control System, Career opportunities , Communication in Industry, Yoga Meditation, Aids awareness and health awareness
3	**Group Discussion :** The students should discuss in group of six to eight students and write a brief report on the same as part of term work. The topic for group discussions may be selected by the faculty members. Some of the suggested topics are - i) Sports ii) Cultural iii) Discipline and House Keeping iv) Current topic related to Electrical Engineering field.

4	**Literature Survey** Student will be provided an emerging engineering topic for literature survey from Internet and other media. Based on inputs on the topics students will prepare a report and submit the sample for evaluation after due presentation before the faculty.
5	**Presentation preparation and demonstration on live sociao economics technical aspects.** Students in batch of maximum 5 numbers are expected to prepare a power point presentation on a topic with minimum of 20 slides. The topics can be from the following: **a.** Rural vs urban divide **b.** Make in India **c.** Gender equality **d.** Satellite launching programs of India **e.** Global Stake in Economics of India **f.** Super power in making: India **g.** Bottom of the pyramid **h.** Social Responsibility of Individual **i.** Swachh Bharat ABhiyan **j.** Namami Gange Project **k.** Digital India

Course Name : 03 Years Diploma in Engineering

Semester   : Second

Subject Title : Programming in C

Subject Code : 205/208

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
L	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03	0		100	80	20	26	40	3 Hrs
Sessional		2	50	30	20		25	3 Hrs

NOTE:

Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

Rationale :

These days computer knowledge is essential for engineers. Analysis and logical development of basic entities is any engineering field requires software development which in turn requires a programming tool. The best opted tool for program development paving way for software is C language these days. The advancement of C and subsequent program development utilising the concepts of strings arrays decision making in unconditional and conditional manner is required.

Objectives:

1. Development of flowcharts/algorithms for engineering problem solutions.
2. Structural modular program development for software implementation.
3. Working upon a statistical attributes on different aspects of engineering problem for arriving at best suited solutions.
4. Decision making in various atmosphere and conditions.
5. A tool for better learning and grasp of basics.

Chapter No.	Contents	Hours	Marks
01	**Basics of C** 1.1 Introduction to number system 1.2 Introduction to flowchart and algorithm 1.3 History of C, where C stands 1.4 C character set ,tokens ,constants ,variables, keywords 1.5 C operators (arithmetic, Logical, assignment, relational, increment and decrement, conditional, bit wise, special, operator precedence),C expressions data types. 1.6 Formatted input, formatted output.	06	12
02	**Decision making** 2.1 Decision making and branching if statement (if, if-else ,else-if ladder, nested if-else) Switch case statement ,break statement. **2.2** Decision making and looping while, do, do-while statements for loop, continue statement**.**	06	10
03	**Arrays and Strings** 3.1 Arrays Declaration and initialization of one dimensional, two dimensional and character arrays, accessing array elements. 3.2 Declaration and initialization of string variables, string handling functions from standard library (strlen(), strcpy(), strcat(), strcmp()).	08	16

04	**Functions, Structures** 4.1 Functions Need of functions, scope and life time of variables, defining functions, function call (call by value, call by reference), return values, storage classes. category of function (No argument No return value, No argument with return value, argument with return value), recursion 4.2 Structures Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure.	**08**	**16**
05	**Pointers** 5 Understanding pointers, declaring pointer variable, initialization of pointer variable, accessing address of a variable, pointer expressions, Pointers arithmetic, pointers and arrays, array of pointers	**08**	**16**
06	**File Handling** File System Basics, opening and closing of files, reading and writing in files, File opening modes, string I/O in files.	06	**10**
	Total	42	**80**

List of Experiments

Exp. -1: Introduction to C compiler

Exp. -2: Simple basic program in C language using unconditional

branching statements.

Exp. -3: Development of C program using conditional branching and

subroutines.

Exp.-4 : Development of program for functions.

Exp. – 5 : Development of program in c for operation of one dimensional arrays.

Exp. – 6 : Development of program in c for operation of Multi-dimensional arrays.

Exp.- 7: Development of program in C for display using in different

modes.

Exp.-8: Development of program in C for operation on structures.

Exp.-9 : Development of program in C for operation on pointers.

Exp.-10: Development of program in C for file handling.

Course Name : 03 Years Diploma in

Engineering Semester : Second

Subject Title : Workshop- II

Subject Code : 209

Teaching and Examination Scheme:

Teaching Scheme			Examination					
L TH	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
		4	50	30	20	--	25	---

Rationale:

Engineering diploma technicians are expected to know basic workshop practice with special reference to Gas and arc Welding, Gas cutting, Drilling, Tapping, Plumbing and Hot Working Processes. The students are required to select and use various tools and equipments for welding, fitting, tapping drilling, plumbing and forging operations.

Objectives:
The student will able to:
- Know basic workshop processes.
- Read and interpret job drawings.
- Identify, select and use various marking, measuring, and holding, striking and cutting tools & equipments wood working and sheet metal shops.
- Operate, control different machines and equipments.
- Select proper welding rods and fluxes.
- Inspect the job for specified dimensions
- Produce jobs as per specified dimensions.
- Adopt safety practices while working on various machines.

Notes: 1] The Faculty / Instructor shall give demonstration to the students by preparing a specimen job as per the job drawing.

2] The workshop diary shall be maintained by each student duly signed by Faculty / Instructor of respective shop.

CONTENTS: Subject practical content as shown in the table below: Skill to be develop.

Intellectual Skills:

1. Ability to read job drawings.
2. Ability to identify and select proper material, tools and equipments and machines.
3. Ability to select proper parameters (like cutting speed, feed, depth cut use of lubricants) in machine.

Motor Skills:

1. Ability to set tools, work piece, and machines for desired operations.
2. Ability to complete job as per job drawing in allotted time.
3. Ability to use safety equipment and follow safety procedures during operations.
4. Ability to inspect the job for confirming desired dimensions and shape.
5. Ability to acquire hands-on experience

Sr. No.	Details of Syllabus	Job	Theory	Practice
01	**HOUSE WIRIING AND ELECTRICAL FITTING** 1. Introduction 2. Various types of electrical wiring 3. Safety precautions 4. Preparation of different type of joints 5. Wiring of two way switching system 6. Wiring of two bulb, one fan one power point with a fuse connection. 7. Introduction to commonly used equipments, earth resistance measurement 8. Fault finding and repairing of common household appliances	03	02	10
02	**Electronics** 1. Introduction to different types of components 2. Soldering practice 3. Soldering of a pyramid 4. Soldering of a battery eliminator circuit/charger 5. Soldering on PCB 6. Introduction to desoldering and practice 7. Introduction to CRO and other electronic measuring instrument	03	02	10
03	**WELDING SHOP** 1. Introduction to equipments and accessories used in welding 2. Gas, Arc, Spot, welding practice 3. Lap welding practice 4. Butt welding practice 5. Spot welding practice	03	04	12
04	**PLUMBING SHOP** 1. Introduction. 2. Various marking, measuring, cutting, holding and striking tools. 3. Different types of G.I. & PVC pipes, flexible pipes used in practice. 4. Piping layout. 5. G.I. & PVC pipes fittings and accessories, Adhesive solvents- chemical action,	03	03	12

| 05 | **Black Smithy Shop** | 03 | 03 |

05   **Black Smithy Shop**   03   03
1. Introduction to tools and techniques
2. Preparation of commonly used instruments such as flat chisel, ring, screw driver.

                              Total 15   14   56

Skill to be developed:

Intellectual Skills:
1. Ability to read job drawing
2. Ability to identify and select proper material, tools, equipments and machine.
3. Ability to select proper parameters (like cutting speed, feed, depth cut use of lubricants) in machine.

Motor Skills:
1. Ability to set tools, work piece, and machines for desired operations.
2. Ability to complete job as per job drawing in allotted time.
3. Ability to use safety equipment and follow safety procedures during operations.
4. Ability to inspect the job for confirming desired dimensions and shape.
5. Ability to acquire hands-on experience.

01	**TURNING SHOP** Note:1] One job related to Plane and Taper turning, threading and knurling 2] One job related to Drilling and tapping 3] Batch size should be selected depending on volume of work. 4]Job allotted should comprise of 6-8 hours of actual working 5] Student shall calculate the cost of material and labor cost for their job from the drawing.
02	**WELDING SHOP** **Note:**1] One job of standard size (Saleable/marketable article shall be preferred) 2] Batch size should be selected depending on volume of work . 3] Job allotted should comprise of 6-8 hours of actual working operations. 4] Student shall calculate the cost of material and labor required for their job from the drawing.
03	**PLUMBING SHOP** • Demonstration of PVC pipe joint with various fittings. • Exercise for students on preparing actual pipeline layout for PVC pipe. Preparing actual drawing and bill of material.

(Note: Utility item are not to be assessed

Books:

Sr. No.	Author	Title	Publisher
01	S.K. Hajara Chaudhary	Workshop Technology	Media Promotors and Publishers, New Delhi
02	B.S. Raghuwanshi	Workshop Technology	Dhanpat Rai and Sons, New Delhi
03	R K Jain	Production Technology	Khanna Publishers, New Delhi
04	H.S.Bawa	Workshop Technology	Tata McGraw Hill Publishers,New Delhi
05	--	Kent's Mechanical Engineering Hand book	John Wiley and Sons, New York

Video Cassettes / CDS

- Learning Materials Transparencies, CBT Packages developed by NITTER Bhopal.

Scheme of Teaching and Examination for
3rd Semester of 3 Years Diploma in Computer Science &Engineering

Duration of Semester   **:**   **14 Weeks**
Student Contact Hours   **:**   **36 Hrs**
Total Marks   **:**   **800**

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Math III	301	Theory	4		-	3	100	80	20	26	40
2.	Electronic Devices and circuits	ECE303	Theory	3	-	-	3	100	80	20	26	40
3.	Electrical Technology	ECE304	Theory	3	-	-	3	100	80	20	26	40
4.	Object Oriented Programming	CSE303	Theory	3	-	-	3	100	80	20	26	40
5.	Web Technology	CSE 304	Theory	3	-	-	3	100	80	20	26	40
6.	Electronic Devices and Circuits Lab	ECE307	Practical	-	-	4	4	100	80	20		40
7.	Electrical Technology Lab	ECE308	Practical	-	-	2	4	50	40	10		20
8.	Object Oriented Programming Lab	CSE305	Practical			2	4	50	40	10		20
9.	Web Technology Lab	CSE306	Sessional			2		50	30	20	-	25
10.	Development of Life Skills I	302	Sessional	-	-	4		50	30	20	-	25
Total Hours of Teaching per week :				**16**		**14**						

Total Marks :   Theory   :   Practical   :   Sessional   :

L   :   Lecture,   T   :   Tutorial   P   :   Practical

Note: 1. Period of Class hours should be of 1 hrs duration as per AICTE norms.

2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.

3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.

4. Board will depute examiner for Practical examination.

5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

Diploma in Engineering (All branch except Mining, Arch & Non Tech)

Semester   : 3rd

Subject Title : Engineering Mathematics-III

Subject Code: 301

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
L T H	T	P	Full Marks.	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
03	01		100	80	20	26	40	3 Hrs

NOTE : Internal marks will be allotted on the basis of two snap tests and 2 assignment of equal marks to be conducted by the faculty teaching the subject.

Rationale:

The subject is extension of Engineering Mathematics – 1 & 2 of First year and stepping into the prerequisites to learn Applied Mathematics applicable in engineering solutions. Engineering Mathematics lay down the foundation to understand and express principles and laws involved in other technological subjects. The study of Engineering Mathematics will help to develop the skills essential for new emerging avenues.

Objective:

The student will be able to acquire knowledge of mathematical terms, concepts and principles. They can acquire sufficient mathematical techniques and can develop the ability to apply mathematical methods to solve technical and day to day practicalproblems and to execute management plans with precision.

Sub Objective

This course is divided into five units. After completion of this course one could become able to learn the following.

- Intuitive meaning and Methods of finding integration definite integration andits properties.
- Application of Integration in finding Area, volume of irregular shapes.
- Methods of solving differential equation of first order and first degree.
- Methods for finding approximate roots by using bisection, Regula-falsi, Newton-Raphson method, Gauss elimination, Jacobi and Gauss- Seidal methods.
- Use of Binomial, Normal and Poisson distributions for solving different examples.

- Use of Laplace transform for solving problems of Differential Equations.
- Use of Fourier series for expansion of function at the given interval

Contents: Theory

Chapter	Name of the Topic	Hour	Marks

01	**Integration:**
	1.1 Definition of integration as anti-derivative. Integration of standard function.
	1.2 Rules of integration (Integrals of sum, difference, scalar multiplication).
	1.3 Methods of Integration.
	   1.3.1 Integration by trigonometrical transformation.
	   1.3.2 Integration by substitution
	   1.3.3 Integration by parts.
	   1.3.4 Integration of rational and irrational functions.
	   1.3.5 Integration by Partial fractions.
		7	16

	1.4 Definite Integration.
	   1.4.1 Concept of definite integrations with examples.
	   1.4.2 Properties of definite integral with simple problems.
		3	

	1.5 Applications of definite integrals. 1.5.1 Area under the curve. 1.5.2 Area bounded by two curves.	3	
2	**Differential Equation** 2.1 Definition of differential equation, order and degree of differential equation. Formation of differential equation. 2.2 Solution of differential equations of first order and first Degree such as variable separable form, reducible to Variable separable, Homogeneous and Linear Differential Equation.	6	16
	2.3 Applications of Differential equations. 2.3.1 Rectilinear motion (motion under constant and variable acceleration) 2.3.2 Newton's Law of Cooling	3	
3	**Numerical Methods** **3.1 Solution of algebraic equations** Bisection method, Regula falsi method and Newton–Raphson method.	3	16
	3.2 Solution of simultaneous equations containing 3 unknowns		

	3.2.1 Gauss elimination method. 3.2.2 Jacobi's Iterative method. 3.3.3 Gauss Seidal method.	3	
	3.3 Interpolation 3.3.1 Concept of interpolation and extrapolation. 3.3.2 Different operators (Δ, ∇ &),relation between them, some problems based on operators , formation of Difference Table. 3.3.3 Newton's Forward and Backward difference interpolation formulae. 3.3.4 Lagrange's interpolation formula. 3.3.5 Problems based on above.	6	
	3.4 Numerical Differentiation &Integration. 3.4.1 Newton's forward and backward difference formulae for first and second order differentiation at any point. 3.4.2 Numerical integration Trapezoidal rule and Simpson's $1/3^{rd}$ rule.	3	
4	**4.1 Probability:** 4.1.1 Definition of random experiment, sample space, event occurrence of event and types of events (impossible, mutually exclusive, exhaustive, equally likely) 4.1.2 Definition of probability, addition and multiplication theorems of probability.	05	16
	4.2 Probability Distribution 4.2.1 Binomial distribution. 4.2.2 Poisson's distribution. 4.2.3 Normal distribution 4.2.4 Simple examples based on above .	05	
5	**Laplace Transform** **5.1** Definition of Laplace transforms Laplace transform of standard functions**.** **5.2** Properties of Laplace transform such as Linearity, first shifting, second shifting, multiplication by t^n, division by t. **5.3** Inverse Laplace transforms. Properties-linearly first shifting, second shifting. Method of partial fractions,	3	16
6	**Fourier Series** 6.1 Definition of Fourier series (Euler's formula). 6.2 Series expansion of continuous functions in the intervals $(0,2l),(-l,l),(0,2\pi),(-\pi,\pi)$	3	

7	**Linear Programming** **7.1 Introduction** **7.2 Solution of Linear Programming problem (LPP) by Graphical Method.**	3	
	TOTAL:	56	80

Tutorial: Tutorials are to be used to get enough practice for solving problems. It is suggested that in each tutorial at least five problems should be solved.

Text Book:

Sr. No	Title	Authors	Publications
1	Higher Engg. Mathematics	B. S. Grewal	Dhanpat Rai

Ref. Books:

Sr. No	Title	Authors	Publications
1	Engineering Mathematics	H.K.Das	S.Chand & Company LTD, New Delhi
2	Higher Engineering Mathematics	B.V,Ramana	Mcgraw Hill Education (India) Private limited , New Delhi
3	Practical Mathematics	I.B. Prasad	Khanna
4	Introductory Method of Numerical Analysis	S.S.Shastri	P.H.I
5	Linear Programming	G. Hadley	
6	A text book for class 12, Part- I & II	NCERT	NCERT, Delhi

Subject : Electronic Devices and Circuits

Subject Code : ECE303

L   T   P   **Full Marks- 100 (80+20)**
3   2

1. **SEMICONDUCTOR & PN Junction Diodes :**   **10 hrs**
2. Difference between Conductor, Insulator and Semiconductor, Mobility and conductivity, Charge densities in a semiconductor, Fermi Dirac distribution,   Carrier concentrations and Fermi levels in semiconductor, Generation and recombination of charges, Diffusion and continuity equation,   P and N Type semiconductor, Formation of homogenous and hetrojuntion diodes and their energy band diagrams, PN Junction, V-I characteristics, Small signal models of diode, Diode as a circuit element, Diode parameters and load line concept, Applications of diodes in rectifier, Clipping, Clamping circuits and voltage multipliers, Breakdown diodes, Schottky diodes, and Zener diode as voltage regulator

3. **TRANSISTORS :**   **06 hrs**
Characteristics, Current components, Current gains: alpha and beta. Variation of transistor parameter with temperature and current level, Operating point, Hybrid model, DC model of transistor, h-parameter equivalent circuits. CE, CB and CC configuration. DC and AC an analysis of single stage CE, CC (Emitter follower) and CB amplifiers AC & DC load line, Ebers-Moll model. Biasing & stabilization techniques. Thermal runaway, Thermal stability.

4. **JFET & MOSFET :**   **06 hrs**
Construction and operation, Noise performances of FET, Parasitic of MOSFET, Small signal models of JFET & MOSFET, Biasing of JFET's & MOSFET's, Low frequency single stage CS and CD (source follower) JFET amplifiers, FET as voltage variable resistor and FET as active load, CMOS.

5. **SMALL SIGNAL AMPLIFIERS :**   **06 hrs**
Analysis of   BJT and FET multistage amplifier, DC and RC coupled amplifiers. Frequency response of single and multistage amplifier, mid-band gain, gains at low and high frequency. Analysis of DC and differential amplifiers,   Cascade and cascade configuration of multistage amplifiers (CE-CE, CE-CB, CS-CS and CS-CD), Darlington pair

6. **FEEDBACK AMPLIFIERS & Oscillators :**   **06 hrs**
Classification, Feedback concept, Feedback Topologies, Transfer gain with feedback, General characteristics of negative feedback amplifiers. Analysis of voltage-series, voltage-shunt, current-series and current-shunt feedback amplifier. Stability criterion. OSCILLATORS- Classification. Criterion for oscillation. Tuned collector, Hartley, Colpitts, RC Phase shift, Wien bridge and crystal oscillators, pulse generator.

7.   TUNED AMPLIFIER :   **06 hrs**
Band Pass Amplifier, Parallel resonant Circuits, Band Width of Parallel resonant circuit.
Analysis of Single Tuned Amplifier, Primary & Secondary Tuned Amplifier with BJT &
FET, Double Tuned Transformer Coupled Amplifier. Stagger Tuned Amplifier. Pulse
Response of such Amplifier, class C tuned amplifiers, Shunt Peaked Circuits for Increased
Bandwidth.(Discussion and use as RF and IF stages)

8.   POWER AMPLIFIERS –   **06 hrs**
Classification, Power transistors & power MOSFET (DMOS, VMOS). Output power,
power dissipation and efficiency analysis of Class A, class B, class AB, class C, class D
and class E amplifiers as output stages. Push pull amplifiers with and without transformers,
Complementary symmetry & quasi complimentary symmetry amplifiers

Subject : Electronic Devices and Circuits
Subject Code : ECE307

List of experiments

1. Study the following devices: (a) Analog & digital multimeters (b) Function/ Signal generators (c) Regulated d. c. power supplies (constant voltage and constant current operations) (d) Study of analog CRO, measurement of time period, amplitude, frequency & phase angle using Lissajous figures.
2. Plot V-I characteristic of P-N junction diode & calculate cut-in voltage, reverse Saturation current and static & dynamic resistances.
3. Plot V-I characteristic of zener diode and study of zener diode as voltage regulator. Observe the effect of load changes and determine load limits of the voltage regulator.
4. Plot frequency response curve for single stage amplifier and to determine gain bandwidth product
5. Plot drain current - drain voltage and drain current – gate bias characteristics of field effect transistor and measure of Idss & Vp
6. Application of Diode as clipper & clamper
7. Plot gain- frequency characteristic of two stage RC coupled amplifier & calculate its bandwidth and compare it with theoretical value.
8. Plot gain- frequency characteristic of emitter follower & find out its input and output resistances.
9. Plot input and output characteristics of BJT in CB, CC and CE configurations. Find their h-parameters
10. Study half wave rectifier and effect of filters on wave. Also calculate theoretical & practical ripple factor.
11. Study bridge rectifier and measure the effect of filter network on D.C. voltage output & ripple factor.

Subject : Electrical Technology
Subject Code : ECE304

L	**T**	**P**	**Full Marks 100 (80+20)**
3		**2**	**Hours - 42**

Objectives:
This is a foundation course to understand the basic principles and behavior of electrical circuits, electrical power apparatus and utilization of electrical energy.

1. **Electrical Engg Fundamentals**   **5 hrs**

   Introduction to electrical circuits: Electric field, electric current, potential and potential difference, electric power, basic circuit components, ohm's law.
   Sources and its types, Ideal and practical sources, Source Conversion, independent and dependent sources, Energy Stored in Inductor and Capacitor, series, parallel and series and parallel circuit.

2. **DC Networks & Theorems:**   **05 hr**
   Laws and Theorems applicable to DC networks (KCL & KVL, Node voltage & Mesh current analysis, Star-Delta and Delta-Star conversion, Superposition principle, Thevenin & Norton theorem),Transients in R-L and R-C circuits withDC excitation, Simple problems.

3. **AC Fundamentals**   **6 hrs**
   Single-Phase AC Circuits: Single-phase EMF Generation, Average and Effective value of periodic ac signals, Peak factor & Form factor, Phasor and Complex representation of sinusoids, Power factor, complex power.
   Three-Phase AC Circuits: Comparison between single-phase and three-phase systems, three phase EMF Generation, Line and Phase quantities in star and delta networks,

4. **Magnetic circuits & Transformers**   **10 hrs**
   Introduction to Magnetic Circuits: Introduction to Electromagnetism, B-H curve, Permeability, Reluctance, Solution of magnetic circuits, Hysteresis and Eddy current loss.
   Single-Phase Transformers: Construction and principle of operation, EMF Equation, Transformation ratio, Practical and Ideal transformers, Transformer losses, Brief idea on Transformer Phasor diagram and transformer rating, Auto transformer. Introduction to 3 phase transformer

5. **D C Machines**   **8 hrs**
   D.C. Machines: Principle of operation, construction, classification of DCmachines,
   EMF equation of DC generator, Speed Equation of DC Motor.Series , shunt and compound dc moters.

6. **AC Machines**   **4 hrs**

   Induction Motors: Introduction to Single-phase and Three-phase InductionMotors, Concept of Slip. Synchronous motors and special types of ac motors.

7. **Power Systems**:   **04 hrs**

   Introduction to generation, transmission and distribution of AC Power, basicidea on grounding, and safety, illumination

Text/reference books:

1. Rizzoni,Principles and Applications of Electrical Engineering., McGrawHill
2. Hughes, "Electrical & Electronic Technology", Ninth Edition Pearson Education.
3. V.D.Toro, "Basic Electrical Engineering", Prentice-Hall of India.
4. B.L.Theraja, A.K.Theraja, "A textbook of Electrical Technology" S.Chand. Ltd.
5. Rajendra Prasad, "Fundamentals of Electrical Engineering", PHI,
6. 6.D P khothari and I J Nagratha "Basic electrical engineering" 2nd ed, TMH.
7. N.N.ParkerSmith,"Problems in Electrical Engineering", CBS Publisher

Semester:- 3rd Semester

Subject Name : Object Oriented Programming

Subject Code : CSE303

L	T	P	
3	2		

Total Hours 42 Th

FM Marks : 100 (80+20)

1. Concept of Object Oriented Programming   4 hrs

Basic concepts, Benefits of OOPs, Procedure Oriented Programming versus Object Oriented Programming, Structure of C++ Programs.

2. Objects & Classes   6 hrs

Specifying a Object & Class, Access Specifiers, Defining member functions, Inline function, Arrays within a class, Static data& member functions, Arrays of Objects, Objects as Function Arguments, Friend function.

3. Constructors & Destructors   5 hrs

Concept of Constructor, Types of Constructors (Parameterized, Copy, Default),Overloaded Constructors (Multiple constructor), Constructor with default arguments, Destructors.

4. Inheritance   7 hrs

Concepts of Inheritance, Types of Inheritance(Single, Multilevel, Multiple, Hierarchical, Hybrid), Virtual Base Class, Abstract Class, Constructor in DerivedClass, Member Classes, Concepts of Overriding.

5. Polymorphism   6 hrs

Concepts of Polymorphism, Types of Polymorphism, Function overloading, Operator Overloading(Unary & Binary Operator), Rules for overloading operators,Virtual Functions, Rules for Virtual Functions, Pure Virtual Function.

6. I/O Operations and File Processing   8 hrs

C++ Stream Classes, Formatted & Unformatted I/O Operations, Managing output with Manipulators, Classes for file stream operations, Opening and Closing a file, Reading and Writing character from a file(get(), put(), getline(), write(),eof()), FilePointers and their manipulations, Command-Line Arguments.

7. Exception Handling   6 hrs

Basics of Exception Handling, Exception Handling Mechanism, Throwing Mechanism, Catching Mechanism, Rethrowing an Exception Specifying Exceptions.

Reference Books:-

1. Object Oriented Programming with C++   - E.Balagurusamy (Tata McGraw Hill)
2. Object Oriented Programming in Turbo C++   - Lafore Robert (Galgotia)
3. C++ The Complete Reference   - Schilt(Tata McGraw Hill)

Subject :-OOPS Lab Subject

Code :-CSE305

List of Practicals:

1. WAP to input integer ,float, char and string using c in and display using c outstatement.

2.WAP to create objects of class.

3.WAP to access static member variables and static member functions.

4.WAP to print all even numbers in between two values entered by user using loopstatement.

5.WAP to print list of prime numbers between any two entered values.6.WAP to

print factorial of a given number.

7.WAP to display whether a number is Palindrome or not. 8.WAP to

display whether a number is Armstrong or not. 9.WAP to display

Fibonacci series up to n times entered by user.10.WAP to demonstrate

execution of constructor and destructor.11.WAP to implement inline and

friend function.

12.WAP to declare a pointer to array and display the elements.13.WAP

to implement this pointer.

14.WAP to overload unary and binary operator.

15.WAP to show hierarchical inheritance.

16.WAP to access private member variables of base class using pointers.17.WAP to

overload member function in base and derived class.

18.WAP to implement virtual function. 19.WAP to

format output using manipulators.

20. WAP to read and write contents of file. Use of () function.

SUBJECT : WEB TECHNOLOGY

Subject Code : CSE304

L T P	Full marks 100 th + 50 Pr
3 2	Hours 42 Th + 28 Pr

Web Essentials: **6 Hrs**

Clients,   Servers,   and   Communication.   The   Internet-Basic   Internet Protocols -
The World Wide Web-HTTP request message-response message-WebClients Web Servers-
Case Study. Mark up Languages: XHTML. Basics of HTML, XHTML Syntax and Semantics,
URLs-Lists-tables-Frames-Forms-XML Creating HTMLDocuments, Case Study.

1. Style Sheets: **10Hrs**
CSS- Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and
HTML Style Rle Cascading and Inheritance-Text Properties-Box Model Normal Flow Box
Layout-Beyond the Normal Flow-Other Properties-Case Study. Client- Side Programming:
The JavaScript Language-History and Versions IntroductionJavaScript in Perspective-
Syntax-Variables and Data Types-Statements-Operators- Literals-Functions-Objects-Arrays-
Built-in Objects-JavaScript Debuggers.

2. Host Objects :   **10Hrs**
Browsers and the DOM-Introduction to the Document Object Model DOMHistory and
Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event
Handling-Accommodating Noncompliant Browsers Properties of window-Case Study. Server-
Side Programming: Java Serve lets- Architecture -Overview-A Serve let-Generating Dynamic
Content-Life Cycle-Parameter Data-Sessions-Cookies- URL Rewriting-Other Capabilities-
Data Storage Serve lets and Concurrency-Case Study- Related Technologies.

3. Representing Web Data: **8Hrs**
XML-Documents   and   Vocabularies-Versions   and   Declaration   - Namespaces
JavaScript and XML: Ajax-DOM based XML processing Event-oriented Parsing: SAX-
Transforming XML Documents-Selecting XML Data: XPATH- Template based
Transformations: XSLT- Displaying XML Documents in Browsers-Case Study- Related
Technologies.

4. JSP Technology   **8Hrs**
Introduction-JSP and Servelets- Running JSP Applications Basic JSP- JavaBeansClasses and
JSP-Tag Libraries and Files- Support for the Model- View- Controller Paradigm-Case Study-
Related Technologies.

TEXT BOOK

1. Jeffrey C. Jackson, "Web Technologies--A Computer Science Perspective", PearsonEducation, 2006.

REFERENCES BOOK

1. Robert. W. Sebesta, "Programming the World Wide Web", Fourth Edition, Pearson Education, 2007.
2. Deitel, Deitel, Goldberg, "Internet & World Wide Web How To Program", Third Edition, Pearson Education, 2006.
3. Marty Hall and Larry Brown," Core Web Programming" Second Edition, Volume Iand II, Pearson Education, 2001.
4. Bates, "Developing Web Applications", Wiley, 2006.

Subject: Web Technology Lab

Subject Code : CSE306

LIST OF PRACTICAL:

1. Design web pages for your college containing a description of the courses, departments, faculties, library etc, use href, list tags.
2. Write html code to develop a webpage having two frames that divide the webpage into two equal rows and then divide the row into equal columns fill each frame with a different background color.
3. Create your resume using HTML tags also experiment with colors, text , link ,size and also other tags you studied.
4. Design a web page of your home town with an attractive background color, text color, an Image, font etc. (use internal CSS).
5. Use Inline CSS to format your resume that you created.
6. Develop a JavaScript to display today's date.
7. Create HTML Page with JavaScript which takes Integer number as input and tells whether the number is ODD or EVEN.
8. Create HTML Page that contains form with fields Name, Email, Mobile No , Gender , Favorite Color and a button now write a JavaScript code to combine and display the information in textbox when the button is clicked.
9. Create XML file to store student information like Enrollment Number, Name , Mobile Number , Email Id.
10. Create a web page with the following.
    i. Cascading style sheets.

    ii. Embedded style sheets.

    iii. Inline style sheets. Use your college information for the web pages.

Subject Title : Development of Life Skills- I Subject Code :302

Rationale:

In today's competitive world, the nature of organizations is changing at very rapid speed. In this situation the responsibility of diploma holder is not unique. He will be a part of ateam in the organization. As such the individual skills are not sufficient to work at his best.

This subject will develop the student as an effective member of the team. It will develop the abilities and skills to perform at highest degree of quality as an individual as well as amember of core group or team. Such skills will enhance his capabilities in the field of searching,assimilating information, managing the given task, handling people effectively, solvingchallenging problems.

THE SUBJECT IS CLASSIFIED UNDER HUMAN SCIENCE.

Objectives:

The students will be able to:

1. Develop team spirit i.e. concept of working in teams
2. Apply problem solving skills for a given situation
3. Use effective presentation techniques
4. Apply techniques of effective time management
5. Apply task management techniques for given projects
6. Enhance leadership traits
7. Resolve conflict by appropriate method
8. Survive self in today's competitive world
9. Face interview without fear
10. Follow moral and ethics
11. Convince people to avoid frustration

CONTENTS: Interaction by faculty / professional

Chapter No.	Name of theTopic	Suggested hours
1	**SOCIAL SKILLS** Society, Social Structure, Develop Sympathy And Empathy.	01
2	Swot Analysis – Concept, How to make use of SWOT.	01
3	**Inter personal Relation** Sources of conflict, Resolution of conflict Ways to enhance interpersonal relations.	02
4	**Problem Solving** I)**STEPS IN PROBLEM SOLVING,** 1)Identify and clarify the problem, 2)Information gathering related to problem,3)Evaluate the evidence, 4)Consider alternative solutions and their implications,5)Choose and implement the best alternative, 6)Review II)**Problem solving technique**.(any one technique may be considered) 1) Trial and error, 2) Brain storming, 3) Lateral thinking	02
5	**Presentation Skills** Body language -- Dress like the audience Posture, Gestures, Eye contact and facialexpression. STAGE FRIGHT, Voice and language – Volume, Pitch, Inflection, Speed, PausePronunciation, Articulation, Language, Practice of speech. Use of aids –OHP,LCD projector, white board	03

6	**Group discussion and Interview technique** – Introduction to group discussion,Ways to carry out group discussion, Parameters— Contact, body language, analytical and logicalthinking, decision making **INTERVIEW TECHNIQUE** Necessity, Tips for handling common questions.	**03**
7	**Working in Teams** Understand and work within the dynamics of a groups.Tips to work effectively in teams, Establish good rapport, interest with others and work effectivelywith them to meet common objectives, Tips to provide and accept feedback in a constructive andconsiderate way , Leadership in teams, Handling frustrations in group.	**02**
8	**Task Management** Introduction, Task identification, Task planning, organizing andexecution, Closing the task	**02**
	TOTAL	**16**

CONTENTS: PRACTICAL -

List of Assignment: (Any Eight Assignment)

1. SWOT analysis:-Analyse yourself with respect to your strength and weaknesses,opportunities and threats. Following points will be useful for doing SWOT.
    a) Your past experiences,
    b) Achievements,
    c) Failures,
    d) Feedback from others etc.

2. Undergo a test on reading skill/memory skill administered by your teacher.

3. Solve the true life problem.

4. Form a group of 5-10 students and do a work for social cause e.g. tree plantation, blood donation, environment protection, camps on awareness like importance of cleanliness in slump area, social activities like giving cloths to poor etc.(One activity per group)

5. Deliver a seminar for 10-12 minutes using presentation aids on the topic given by your teacher.

6. Watch/listen an informative session on social activities. Make a report on topic of your interest using audio/visual aids. Make a report on the programme. ####

7. Conduct an interview of a personality and write a report on it.

8. Discuss a topic in a group and prepare minutes of discussion. Write thorough description of the topic discussed

9. Arrange an exhibition, displaying flow-charts, posters, paper cutting, photographs etc on the topic given by your teacher.

Note: - Please note that these are the suggested assignments on given contents/topic. These assignments are the guide lines to the subject teachers. However the subject teachers are freeto design any assignment relevant to the topic. The **term work** will consist of any eight assignments.

Mini Project on Task Management: Decide any task to be completed in a stipulated time with the help of teacher. Write a report considering various steps in task management.

REFERENCE BOOKS:

Chapter No.	Title of the book	Author	Publisher
1	Adams Time management	Marshall Cooks	Viva Books
2	Basic Managerial Skills for All	E.H. Mc Grath , S.J.	Pretice Hall of India
3	Body Language	Allen Pease	Sudha Publications Pvt. Ltd.
4	Creativity and problem solving	Lowe and Phil	Kogan Page (I) P Ltd
5	Decision making & Problem Solving	by Adair, J	Orient Longman
6	Develop Your Assertiveness	Bishop , Sue	Kogan Page India
7	Make Every Minute Count	Marion E Haynes	Kogan page India
8	Organizational Behavior	Steven L McShane and Mary Ann Glinow	Tata McGraw Hill
9	Organizational Behavior	Stephen P. Robbins	Pretice Hall of India, Pvt Ltd
10	Presentation Skills	Michael Hatton(Canada – India Project)	ISTE New Delhi
11	Stress Management Through Yoga and Meditation	--	Sterling Publisher Pvt Ltd
12	Target setting and Goal Achievement	Richard Hale ,Peter Whilom	Kogan page India
13	Time management	Chakravarty, Ajanta	Rupa and Company
14	Working in Teams	Harding ham .A	Orient Longman

INTERNET ASSISTANCE

1. http://www.mindtools.com
2. http://www.stress.org
3. http://www.ethics.com
4. http://www.coopcomm.org/workbook.htm
5. http://www.mapfornonprofits.org/
6. http://www.learningmeditition.com http://bbc.co.uk/learning/courses/
7. http://eqi.org/
8. http://www.abacon.com/commstudies/interpersonal/indisclosure.html
9. http://www.mapnp.org/library/ethics/ethxgde.htm
10. http://www.mapnp.org/library/grp_cnfl/grp_cnfl.htm
11. http://members.aol.com/nonverbal2/diction1.htm
12. http://www.thomasarmstron.com/multiple_intelligences.htm
13. http://snow.utoronto.ca/Learn2/modules.html
14. http://www.quickmba.com/strategy/swot/

RADHA GOVIND UNIVERSITY

Scheme of Teaching and Examination for

4th Semester of 3 Years Diploma in Computer Science & Engineering

Duration of Semester : **14 Weeks**
Student Contact Hours : **36 Hrs**
Total Marks : **800**

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hoursof Exam	Full Marks of Subject	Final Exam /committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Data Structure & Algorithm	CSE 402	Theory	3		-	3	100	80	20	26	40
2.	Computer Hardware & Peripheral	ECE403	Theory	3	-	-	3	100	80	20	26	40
3.	Operating System	CSE403	Theory	3	-	-	3	100	80	20	26	40
4.	Data Communication andComputer Networking	ECE405	Theory	3	-	-	3	100	80	20	26	40
5.	Data Base Management System	CSE404	Theory	3	-	-	3	100	80	20	26	40
6.	Operating System Lab	CSE405	Practical	-	-	2	4	50	40	10	-	20
7.	Data Base Management SystemLab	CSE406	Practical	-	-	2	4	50	40	10	-	40
8.	Data Structure Lab	CSE407	Practical	-		2	-	50	40	10	-	20
9.	Computer Networking Lab	ECE410	Sessional	-		2	-	50	30	20	-	25
10.	Computer Workshop	CSE408	Sessional	-	-	4	-	50	30	20	-	25
11.	Professional Practice II	401	Sessional	-	-	4	-	50	30	20	-	25
	Total Hours of Teaching per week :			**15**		**16**						

Total Marks : Theory : Practical : Sessional :
L : Lecture, T : Tutorial P : Practical

Note: 1. Period of Class hours should be of 1 hrs duration as per AICTE norms.

2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.

3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.

4. Board will depute examiner for Practical examination.

5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

DATA STRUCTURE & ALGORITHMS

L T P   **Full marks -100 Th + 50 Pr**

3   2   **Hours 42 Th + 28 Pr**

Subject Code: CSE402

1. BASIC CONCEPTS -   06 hrs

Problem solving techniques, divide and conquer techniques, top down and bottom up design, Introduction to data structure (Linear, Non Linear) Data types (Primitive, Non Primitive), Space and time Complexity, Concept of arrays, Operation on arrays with algorithms (Searching, traversing, inserting, deleting).

2. LINKED LISTS   08 hrs

Introduction to linked list and double linked list, Representation Of linked lists in memory, comparison between linked list and Array, Traversing a link list, Searching a link list, Insertion And deletion into linked list (At first node, Specified Position, Last node), Application of link list, Doubly linked lists, Traversing a doubly link lists, Insertion and deletion into doubly Link list.

3. STACKS AND QUEUES   08 hrs

Introduction to stacks, representation of stacks with array and link List, Implementation of stacks, Application of stacks (Polish Notations, converting infix to post fix notation, evaluation of Post fix notation, tower of Hanoi), Recursion : concept and Comparison between recursion and iteration, Introduction to queues, Implementation of queues, Circular queues, De-queues.

4. SORTING ALGORITHMS   06 hrs

Introduction, Search Algorithm (Linear and Binary), Concept of sorting. Insertion sorts, Bubble sort, Quick sort, Merge sort, Heap sort

5. TREES & GRAPHS   10 hrs

Concept of Binary Trees (Complete, Extended Binary Tree), Concept and representation of Binary Tree, Concept of balance Binary Tree, Traversing Binary Tree(Pre order, Post order and In Order),Searching, Inserting and deleting in binary search tree, Minimum spanning tree, Depths-first-search and Breath First Search, applicationsof graph.

6. TABLES   04 hrs

Searching Sequential tables, Hash tables and Symbol tables, heaps

Data Structure & Algorithm Lab

Subject Code: CSE 407List

of Experiments:

1. Make a program to insert 10 elements in an array by taking user input.
2. Make a program that demonstrates deletion of elements from beginning, middle, last position from an array.
3. Make a program for merging of elements of two arrays.
4. Make a program that demonstrates PUSH operation of stack.
5. Make a program that demonstrates POP operation of stack.
6. Make a program to insert elements in a linear queue.
7. Make a program to insert elements in a circular queue.
8. Make a program that demonstrates the working of simple list for inserting elements at beginning position, middle position and at the end of list.
9. Make a program that demonstrates the working of circular list for inserting elements at beginning position, middle position and at the end of list.
10. Write a program for insertion sorting.
11. Write a program for bubble sorting.
12. Write a program for quick sort.
13. Write a program for merge sort.
14. Write a program for heap sort.
15. Make a program for binary search.
16. Make a program for linear search.
17. WAP to Create a Tree.
18. WAP to check whether a Tree is a Binary Search Tree.
19. WAP program to construct a B Tree.
20. WAP for Depth First Binary Tree Search.

TEXT BOOKS:-

1) Salaria RS, Data Structures and Algorithm Using C, Khanna Book Publishing Co. (P) Ltd. New Delhi
2) Patel R.B., Expert data structures with C– Khanna Publishers, New Delhi.
3) Schaum's Outline Series – Data structures–McGraw Hill, Delhi.
4) Tanenbaum, Data Structures, Prentice Hall of India, New Delhi.
5) Srivastava SK, Srivastava Deepali, Data Structure through C in depth, BPB Publications Delhi.
   Data Structure by Trimly & Sorenson

Computer Hardware and Peripherals

Subject Code : ECE403

Total Contact Hours : 42

Full Marks : 100 (80+20)

L   T   P

3   0   0

1. **Introduction :**   **04 hrs**
   Digital computer concepts, concept of Hardware & Software, structure & functions of a computer system, Role of operating system , Introduction to finite state machine.

2. **Memory Unit :**   **08 hrs**
   Memory classification , characteristics, Organization of RAM , address decoding ROM/PROM/EEPROM ; Magnetic memories , recording formats & methods , Disk & tape units, Concept of memory map , memory hierarchy , Associative memory organization ; Cache introduction , techniques to reduce cache misses , concept of virtual memory & paging.

3. **CPU Design:**   **10 hrs**
   The ALU – ALU Organization , Integer representation , 1s and 2s complement arithmetic ; Serial & Parallel Address; implementation of high speed Address Carry Look Ahead & carry Save Address; Multiplication of signed binary numbers-Booth's algorithm ; Divide algorithms- Restoring & Non-Restoring ; Floating point number arithmetic; Overflow detection , status flags.

4. **Instruction Set Architecture-**   **06 hrs**
   Choice of instruction set ; Instruction word formats, Addressing modes.

5. **Control Design –**   **10 hrs**
   Timing diagrams; T-States, Controlling arithmetic & logic instruction , control structures; Hardwired & Micro programmed, CISC & RISC characteristics.
   Pipelining-general concept , speed up , instruction & arithmetic pipeline; Examples of some pipeline in modern processors , pipeline hazards; Flynn's classification –SISD ,SIMD , MISD , MIMD architectures-Vector and Array processors & their comparison , Concept of Multiprocessor; Centralized & distributed architectures.

6. **Input/output Organization :**   **04 hrs**
   Introduction to Bus architecture, effect of bus widths, Programmed & Interrupt I/O, DMA.

Reference Books :

1.   Hayes-- Computer Architecture & Organization,3/e ,MH
2.   Carter—Computer Architecture (Schaum Series), TMH
3.   Mano M.M—"Computer System Architecture"
4.   Chaudhury P. Pal—" Computer Organization & Design" , PHI

Operating System

Subject Code : CSE403 Full
Marks: 100 (80+20)Total
Contact Hours: 42

1.   INTRODUCTION TO OS   **6 hrs**
   1.1   Definition of O.S.
   1.2   History of O.S. and different types of operating System, Multiprocessor Systems
           Distributed Systems, Clustered Systems, Real Time Systems, Recent Operating System
           Characteristic
           –XP,WIN 7/8/10
   1.3   Operating system services.
   1.4   System calls – Uses, process control, file management, Device management, Information
           maintenance, communication.
   1.5   Operating system structure: Simple structure, layered, monolithic, microkernel.
   1.6   Booting

2.   PROCESSES   **6 hrs**
   2.1   Definition of process & thread
   2.2   Inter process communication
   2.3   Classical I.P.C. problems
   2.4   Process Scheduling

3.   PROCESS SCHEDULING ALGORITHM   **6 hrs**
   3.1   Resident Monitor (Single user)
   3.2   Multi user system
   3.3   Time sharing system
   3.4   FIFS
   3.5   Round Robin Fashion/Time quantum Concept.
   3.6   Multiple queues
   3.7   Priority queues
   3.8   Shortest job first

4.   MEMORY MANAGEMENT   **6 hrs**
   4.1   Resident Monitor
   4.2   Multiple Partition
   4.3   Garbage collection and compaction
   4.4   Paged memory management
   4.5   Page Replacement Algorithms
   4.6   Swapping
   4.7   Segmentation
   4.8   Segmented paged memory management
   4.9   Demand paged memory management
   4.10   Virtual Memory

5.   FILE SYSTEMS   **6 hrs**
   5.1   Concept of Files & Directories
   5.2   File System Implementation
   5.3   Security Issues in Files

    5.4   Protection Mechanisms
    5.5   Case studies of UNIX file system

6.   INPUT/OUTPUT   4 hrs

    6.1   Principles of I/O Hardware
    6.2   Principles of I/O Software
    6.3   Disk

7.   Device Management   6hrs

    7.1   Techniques for Device Management-Dedicated, shared, virtual
    7.2   Device allocation consideration I/O traffic control & I/O Schedule, I/O Device handlers
    7.3   Spooling

8.   CASE STUDIES   2hrs

    8.1   UNIX O.S
    8.2   LINEX
    8.3   MS_DOS
    8.4   WINDOWS –NT

Operating System

Subject Code : CSE405

LIST OF PRACTICALS:

1. Demonstrate giving brief history of Operating System, types of Operating Systems in use these days, how it is necessary for a computer functioning..
2. Prepare a report on different views of the Operating System, the journey of a command execution, Design and implementation of Operating System.
3. Prepare a report on memory management of Operating System.
4. Prepare a report on file management of Operating System.
5. Demonstrate the Security and Protection features of an Operating System.
6. Demonstrate the functions of Multi Processor Systems.
7. Demonstrate and produce report on computer network algorithms for distributed processing.
8. Prepare a brief history of Windows Operating System.
9. Demonstrate features, tools and accessories of Windows.
10. Demonstrate features of LINEX
11. Demonstrate features of UNIX
12. Demonstrate features of DOS
13. Cell and kernel programming examples
14. Prepare a brief report on features and benefits of Unix Operating System.

Books Recommended:

1. Operating Systems-Concept and Design, McGraw-Hill international Edition-Computer Science Series, 1992 - Milan Milenkovic
2. An introduction to Operating Systems, Addition-Wesley Publishing Company, 1984. - Harvey M. Deitel
3. Operating System Concepts, Addition-Wesley Publishing Company, 1989. - James L. Paterson, Abraham Silbers chatz
4. Modern Operating Systems, Prentice-Hall of India Private Ltd., 1995. - Andrew S. Tanenbaum
5. Modern Operating System Sriram K Vasudevan
6. Operating System Concepts Galvin

DATA COMUNICATION AND COMPUTER NETWORKING

Subject Code : ECE405 Full
Marks : 100 (80+20)Total
Contact Hours : 42LTP3

1. **Introduction to data communication:**   **08 hrs**
   Data Communication, Analog and Digital, Periodic and Aperiodic Signals, Analog Signals, Timeand Frequency Domains ,Composite Signals , Digital Signals. Digital to Digital Conversion, Analog to Digital Conversion, Digital to Analog conversion and Analog to Analog Conversion

2. **Multiplexing & Access Techniques:**   **08 hrs**
   Many to one/one to Many, Frequency division Multiplexing, Wave division Multiplexing, Time division Multiplexing, Multiplexing applications, different access techniques (FDMA, TDMA, CDMA, WCDMA,LTE) Demultiplexing concept and circuit , packet and message switching techniques.

3. **Computer Network :**   **06 hrs**
   Networks, Protocols and Standards, Standards Organizations. Line Configuration, Topology, Transmission Modes, Categories of Networks Internet works. Introduction to OSI and TCP/IP protocol suit.'

4. **Transmission & Network Devices :**   **08 hrs**
   Guided Media, Unguided Media, Transmission Impairments, Performance Wavelength , Shannon Capacity , Media Comparison, PSTN , Switching. Digital data transmission, DTE-DCE Interface, Modems, 56K Modems , Cable Modems, Network classes, Repeaters, Hub, Bridges , Switches, Routers, Gateways , Routing Algorithms, Distance Vector Routing , Link State Routing

5. **Computer Networking :**   **06 hrs**
   Concepts , Types , Common tools and devices used, protocols.

6. **Error Detection and Correction:**   **06 hrs**
    Types of Errors, Detection, Parity Check, Vertical Redundancy Check Longitudinal Redundancy Check, Cyclic Redundancy Check, Checksum, Error Correction

Books:
1. Data communication & Networking by Bahrouz Forouzan.
2. Computer Networks by Andrew S. Tanenbaum
3. Data and Computer Communications by William Stalling

Computer Communication & Networking

LabSubject   **Code : ECE410**

Full marks :

50

L   T   P

2   0   3

OBJECTIVES:

The student should be made to:

Learn to communicate between two desktop computers.

Learn to implement the different protocols

Be familiar with socket programming.

Be familiar with the various routing algorithms

Be familiar with simulation tools.

LIST OF EXPERIMENTS:

1. Study of Network Components.

2. Study of Analog and Digital Signals.

3. Study of Network Topologies.

4. To connect two pc's using peer to peer communication.

    5. Implementation of small network using hub and switch.

6. To study Error Detection methods.

7. To study Error Correction methods.

8. To study the different line coding schemes.

9. Basic study of Network classes.

10. Study of DTE- DCE.

11. Study of Networks.

12. Overview of Boson Simulator.

13. Implementation of Error Detection / Error Correction Techniques

14. Implementation of Stop and Wait Protocol and sliding window

Database Management System

Subject Code : CSE 404   **Total Hours 42 Hrs**

FM 100 Th   50 Pr

L   T   P

3   2

1.Introduction   **4 hrs**

File and Database concept, Database System versus File System, DBMS Architecture, Data Model, DatabaseAdministrator, Database User, Schema, Data independency.

2.Entity-Relationship Model   **4hrs**

Basic concept key, E-R diagram, Strong and Weak Entity Sets, Specialization, Generalization, Aggregation.Codd's 12 rules.

3. Relation Data Model   **8 hrs**

Basic concepts, Types of Keys, Key Constraints, Domain Constraints, Referential Integrity Constraints, Procedural & Non-procedural Relational Algebra, Algebra Operation, Relational Calculus, the Tuple RelationalCalculus, the Domain Relational Calculus.

4. SQL& PL-SQL   **12 hrs**

Basic structure, Data Definition Language, Data Manipulation Language, Data Control Language, Data Query Language, Transaction Control Language , set operations, aggregate functions, group by and having clause, null values, string functions, date and time functions, nested sub queries, Join concepts- Equi Join, Non-Equi Join, SelfJoin, Outer Joins, Views, SQL statement in PL-SQL, Cursors, Triggers, Functions.

5 Normalization, Transaction & Concurrency Control   **10 hrs**
1NF, 2NF, 3NF, BCNF, Multivalued Dependency, 4NF, 5NF,Transaction concept, States of Transaction, ACID properties, Conflict & View serializability, Lock base protocols, Two phase locking, Deadlock handling, Deadlock prevention, detection and recovery scheme.

6 Distributed Databases   **4 hrs**
Basic concepts, Data Fragmentation, Replication and Allocation techniques, Types of Distributed DatabaseSystems, Client-Server Architecture & its relationship to Distributed Databases.

Reference Books :-

1. Database System Concepts – By Korth (TMH)
2. An Introduction to Database System – By Bipin Desai (Galgotia Publication)

Database Management System Lab

Subject Code: CSE406

List of Practical's:

1. Executing DDL and DML commands

2. Study of various type of integrity Constraints.

3. Executing relational, logical and mathematical set operators using SQL.

4. Study of SELECT command with different clauses.

5. Study of GROUP functions

6. Executing DATE &Time functions.

7. Executing DCL in SQL.

8. Study of various type of SET OPERATORS.

9. Study of various JOINS.

10. Program using if then else in PL/SQL

Computer Workshop

Subject Code: CSE408

Learning Objective

Students get the knowledge to support and maintain computer systems, desktops, and peripherals.

This includes installing, diagnosing, repairing, maintaining, and upgrading all hardware and

equipment whileensuring optimal workstation performance.

Contents :

1. **Basic blocks of a digital computer.**   **4 Hrs**
   1.1   Introduction to computers, classification, generations, applications.
   1.2   Hand Tools Basics and Specifications.
   1.3   Types of cabinets, relation with mother board form factor. Precautions to be taken while openingand closing PC cabinet.
   1.4   Main devices, components, cards, boards inside a PC(to card or device level only).
   1.5   Types and specifications of the cables and connectors used for interconnecting the devices,boards, cards, components inside a PC.
   1.6   Precautions to be taken while removing and/or reconnecting cables inside a PC.

2 **Hardware Identification**   **4 Hrs**
   2.1   Identify the front and rear panel controls and ports on a PC Cases, Cooling, Cables & Connectors Power Supplies, Connections Motherboard, Connections Motherboard , Components CPU (Processor), RAM (Memory), Hard Drive , Connections Mechanical vs. Solid State Drives ROM Drives, Video Cards, Sound Cards , Use Of Debug Card Post Error & Code, SMPS Tester, PCI slot testing tool.
   2.2   Types of I/O devices and ports on a standard PC for connecting I/O devices.
   2.3   Function of keyboard, brief principle, types, interfaces, connectors, cable.
   2.4   Function of Mouse, brief principle, types, interfaces, connectors, cable.
   2.5   Function of monitor, brief principle, resolution, size, types, interfaces, connectors, cable.
   2.6   Function of Speakers and Mic, brief principle, types, interfaces, connectors, cable.
   2.7   Function of serial port, parallel port, brief principle of communication through these ports, typesof devices that can be connected, interface standards, connectors, cable.
   2.8   Precaution to be taken while connecting/removing connectors from PC ports. Method ofensuring firm connection

3. **Hardware Remove -Test Replace/ Install**   **8 Hrs**
   3.1   Removing & Installing RAM, Removing a ROM Drive & Installing a ROM Drive, Removing a Hard Drive & Installing a Hard Drive , Defects related to SMPS, its cable, connector and servicing procedure. Removing a Power Supply Installing a Power Supply , Removing a Video Card & Installing a Video Card, Install Expansion Cards Removing Fans & Installing Fans, Removing the Motherboard & Installing the Motherboard, Removing the Processor & Installing the Processor, Troubleshooting, Checking the Power Switch, Removing the CMOS Battery .
   3.2   Types of Processors and their specifications (Intel: Celeron, P4 family, Xeon, dual core, quadcore, core 2 duo, i3,i5,i7 and AMD).
   3.3   Memory devices, Semiconductor memories, RAM, ROM, PROM, EMPROM, EEPROM, Example of memory chips, and Concept of track, sector, and cylinder. FD Drive components- read write head, head actuator, spindle motor, sensors.
   3.4   Precaution and care to be taken while dismantling Drives. Drive bay, sizes, types of drives that can be fitted. Precautions to be taken while removing drive bay from PC, popular brands,

standards, interface, jumper setting. Drive components- hard disk platens, and recording media, ,air filter, read write head, head actuator, spindle motor, circuit board, sensor, features like head parking, head positioning, reliability, performances, shock mounting capacity. HDD interface IDE, SCSI-I/2/3 comparative study. Latest trends in interface technology in PC and server HDD interface.

Precautions to be taken while fitting drives into bays and bay inside PC cabinet.

3.5 CMOS setting (restrict to drive settings only)

3.6 Meaning and need for using Scan disk and defrag.

3.7 Basic blocks of SMPS, description of sample circuit

4. Operating System & Application Software Installation 10 Hrs

4.1 Partitioning hard disk (primary and extended partitions).

4.2 A walkthrough of installing Windows 7 / 8 /10 A walkthrough of installing Windows7/ 8/10, Imaging: create a Windows system image, How to Backup/Restore your Windows partition with the bootable image disk Duplicating a partition (creating a multiboot system) A multiboot system: the Windows boot manager vs. an alternative boot manager, Setting up a multiboot/dual boot system Dual Boot Ubuntu and Windows registry & tweaks.

4.3 My computer, network neighbourhood/ network places, Properties of connected devices. Applications under windows accessories. Windows Help. Finding files, folders, computers.Control panel, Installed devices and properties.

4.4 Data Backup 3 types of media to use when backing up your data, and when each method is appropriate How to create automated backups to ensure you always have a recent backup Learn how to manually backup data , How to make an exact copy (clone) of a hard drive.

4.5 Linux operating system - Installing UNIX / LINUX - Preparing functional system UNIX/LINUX - Adding new users, software, material components - Making back-up copies of the index and files - Dealing with the files and indexes.

4.6 **Installation of commonly used Application Softwares**

5. PC Cleaning & Hardware Troubleshooting 6 Hrs

5.1 The best cleaning supplies to use, How to increase airflow and increase your computer'slifespan, How to clean your computer.

5.2 The danger in not diagnosing problems first learn how to test your RAM, Check your hard drivefor errors.

5.3 Minor repairs and maintenance of CD ROM/DVD ROM drives.

5.4 Minor repairs and maintenance of DAT drive.

5.5 Hard Drive Failure, How to Troubleshoot a Noisy Hard Drive, How to Format a Hard Drive, How to Completely Erase a Hard Disk Drive Installation and configuration of storage devices. Integration of PATA and SATA drivers. Recover emails, files, and data from a crashed hard drive or computer.

5.6 Latest trends in backup devices/media.

6. System Utilities and Virus Removal 6 Hrs

6.1 Bad Sectors in Hard disk, Master Boot Record, in-place installation, Registry fixing, performance level check, Shortcut fixing, Fixing Startup process, log, etc. Users and user account. Privileges, scope, permissions etc. Concept of Virtual Machine.

6.2 How to check to see if your hard drive has bad sectors, Fix the master boot record How to run an in-place installation, Using Task Manager and event viewer. Using System Monitor and Performance Logs. Configure config.sys file.

6.3 Learn how to prevent your PC from getting malware, All the different types of malware and how they attack your PC The difference between Anti Virus and Anti-Spyware software, How torun a full system scan, How to fix your browser from redirecting to other websites (browser hijack), Using a modern anti-virus utility, When utilities don't fix everything, how to manually remove a virus specific things to disable when trying to get

7.   **User Account Customization**   **6 Hrs**

     7.1   How to create and configure user accounts in Windows XP,Vista,7/8/10, Make Changes to an Account, Changing the storage location of the personal folders, Changing the storage location of installed software's , Setting up Parental Controls in Windows XP,Vista,7, 8,10 How to Use Fast User Switching in Windows View Hidden Files and Folders, Lock Down Windows 7 / 8/10 With User Account Control How to Delete User Accounts in Windows.

8.   **Windows Update, Software Installation & Device Drivers**   **10 Hrs**

     8.1   How to find your system version in Windows, How to perform a Windows Update.

     8.2   Installing a software program in windows, How to run a file from MS-DOS Extracting or uncompressing a compressed file, How to compress or make files into one file Extracting files from the Windows cabinets Uninstalling Windows software Unable to remove a program from Windows Add/Remove programs.

     8.3   How to Update Drivers in Windows, How To Roll Back a Driver in Windows Familiarizationwith Device manager. Interfacing with cell-phone, tablet PC, synchronization of contacts.

     8.4   How to Repair Corrupted Files Problems, How to check for corrupted files Restore your machine back to normal, Hard disk is filling up, what should one do?

     8.5   Power on self test, Peripheral diagnostics, general purpose diagnostics, and Operating systemdiagnostics. Hardware boot process, Windows boot process.

     8.6   Configure outlook, Backup and Restore Outlook, How to restore the Outlook, default installation, toolbars and settings, Restore Deleted Items from an Outlook PST-file.

Reference Books :-

1. Inside PC   Norton
2. Computer Installation and servicing   BPB Publication
3. OS Programming   Peter Norton
4. Servicing PC and Computers   BPB Publication

Professional Practices-II

Subject Code : 401

Rationale:

Most of the diploma holders join industries. Due to globalization and competition in the industrial andservice sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicateand their attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence.

Objective:

1. Applied Knowledge: Use theory in real-world scenarios.
2. Critical Thinking: Analyze and solve complex problems.
3. Professional Standards: Understand ethics and best practices.
4. Communication Skills: Enhance written and oral communication.
5. Project Management: Learn to plan and manage projects.
6. Collaborative Work: Foster teamwork and collaboration.
7. Reflective Practice: Promote self-reflection for continuous improvement.

Sl. No.	Activity Heads	Activities	Suggested Hrs
1.	Acquire information from different sources	Topic related to the branch and current area of interest i.e. articles in internet on which research or review is undergoing may be decided for the students group. The group may berestricted to maximum 5 students. Literature survey from Internet , print media and nearby practices may be undertaken. Minimum of 10 to 15 papers may be suggested for reading to get an overview and idea of matters.	12
2.	Prepare notes for given topic	Making review or concept to be penned down in form of a article .(the article or review may be of 8 – 10 pages length in digital form of 12 font size in Times New Roman font)	4
3.	Present given topic in a seminar	A seminar or conference or work shop on branch related topic is to be decided and all students in group of 5-6 students may be asked to present their views.	4
4.	Interact with peers to share thoughts	A power point presentation of the article prepared in stage 2 may be presented before the classmates and faculty members.	4
5.	Prepare a report on industrial visit, expert lecture	A topic on best practices and product / software development may be assigned to the student group. The group may be asked to prepare a survey, come to opinion making and list out the activities to develop the activities with SWOT analysis.	12

Scheme of Teaching and Examination for
5 th Semester of 3 Years Diploma in Computer Science & Engineering

Duration of Semester   **:**   **14 Weeks**

Student Contact Hours   **:**   **36 Hrs**

Total Marks   **:**   **800**

Sl. No.	Name of Subject	SubjectCode	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Microprocessors & Microcontrollers	CSE 503	Theory	3		-	3	100	80	20	26	40
2.	Java Programming	CSE 504	Theory	3	-	-	3	100	80	20	26	40
3.	Computer Graphics	CSE505	Theory	3	-	-	3	100	80	20	26	40
4.	Elective I	CSE 506/507/508	Theory	3	-	-	3	100	80	20	26	40
5.	Elective II	CSE 509/510/511	Theory	3	-	-	3	100	80	20	26	40
6.	Java Programming Lab	CSE512	Practical	-	-	2	4	50	40	10	-	20
7.	Computer Graphics Lab	CSE513	Practical	-	-	2	4	50	40	10	-	20
8.	Elective I lab	CSE 514/515/516	Sessional	-	-	2	-	50	30	20	-	25
9.	Elective II Labs	CSE 517/518/519	Sessional	-	-	2	-	50	30	20	-	25
10.	In Plant Training	502	sessional	-	-	-	-	50	30	20	-	25
11.	DLS	501	Sessional	-	-	4		50	30	20	-	25
Total Hours of Teaching per week				**15**		**14**						

Elective I (Mobile Computing- CSE 506/ System Software & Administration-CSE 507/ Advance Web Technology-CSE 508) Elective II (Artificial Intelligence CSE509/Data Mining CSE 510/e- Commerce CSE 511)

Total Marks: Theory   :   Practical   :   Sessional   :
           L   :   Lecture,   T   :   Tutorial   P   :

PracticalNote: 1. Period of Class hours should be of 1 hrs duration as per AICTE norms.

2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.

3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.

4. Board will depute examiner for Practical examination.

5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

6. Inplant Training of 04 weeks duration to be undertaken after 4th semester Exam and before start of 5th semester classes.

Subject   : **Microprocessor & Microcontroller**
Subject Code   : **CSE503**
Total Hours   **42**
Full Marks   **: 80 + 20 = 100**

OBJECTIVES:

The student should be made to:

 Study the Architecture of 8085 and 8086 microprocessor.

☐   Learn the design aspects of I/O and Memory Interfacing circuits.

☐   Study about communication and bus

         interfacing.Study the Architecture of 8051

         microcontroller.

UNIT I   THE 8085 MICROPROCESSOR   4 Hrs

Introduction to 8085 – Microprocessor architecture , pin out diagram, – Addressing modes - Instruction set, Interrupts and interrupt service routines.

UNIT II   THE 8086 MICROPROCESSOR   8 Hrs

 Introduction to 8086 – Microprocessor architecture – Addressing modes - Instruction set and assembler directives – concept of pipelining, Assembly language programming – Modular Programming - Linking and Relocation - Stacks - Procedures – Macros – Interrupts and interrupt service routines – Byte and String Manipulation.

UNIT III 8086 SYSTEM BUS STRUCTURE   6 Hrs

8086 signals – Basic configurations – System bus timing –System design using 8086 – IO programming – Introduction to Multiprogramming – System Bus Structure - Multiprocessor configurations – Coprocessor, Closely coupled and loosely Coupled configurations.

UNIT IV I/O INTERFACING   6 Hrs

 Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – D/A and A/D Interface - Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications Case studies: Traffic Light control, LED display , LCD display, Keyboard display interface and Alarm Controller.

UNIT V   MICROCONTROLLER   6 Hrs

Architecture of 8051 – Special Function Registers(SFRs) - I/O Pins Ports and Circuits - Instruction set - Addressing modes - Assembly language programming.

UNIT VI   INTERFACING MICROCONTROLLER   **9 Hrs**

Programming 8051 Timers - Serial Port Programming - Interrupts Programming – LCD & Keyboard Interfacing - ADC, DAC & Sensor Interfacing - External Memory Interface- Stepper Motor and Waveform generation.

TEXT BOOKS:

1   Microprocessor Architechture, Programming and Applications with 8085   by Ramesh KGoankar, Galgotia Pub

2   Digital Computer System by Malvino (2nd Ed) TMH

3.   Yu-Cheng Liu, Glenn A.Gibson, "Microcomputer Systems: The 8086 / 8088 Family -Architecture, Programming and Design", Second Edition, Prentice Hall of India, 2007.

4.   Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, "The 8051 Microcontrollerand Embedded Systems: Using Assembly and C", Second Edition, Pearson education, 2011.

 REFERENCE: 1. Doughlas V.Hall, "Microprocessors and Interfacing, Programming and Hardware",TMH,2012

Subject	**: Java Programming**
Subject Code	**: CSE504**
Total Hours	**42**
Full Marks	**: 80 + 20 = 100**

MODULE-1

Introduction to Java: 12 hrs

Fundamentals of Object Oriented Programming , Object and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic Binding. Java Features:- Compiled and Interpreted, Platform independent and portable, Object oriented Distributed, Multithreaded and interactive, High performance. Constant, Variables and Data Types, Constant, Data Types, Scope of variable, Symbolic Constant, Type casting, Standard default values. Operator and Expression:- Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operator Increment and Decrement Operator, Conditional Operator, Bit wise Operator, Special Operator. Decision making and Branching:- Decision making with if statement, Simple if statement, The if else statement, The else if ladder, The switch statement, The? : Operator. Decision making and Looping:-The While statement, The do statement, The for statement, Jumps in Loops, Labeled Loops.

MODULE-2

Classes, Object and Methods: 10 hrs

Defining a class, Creating object, Accessing class members, Constructor, Methods Overloading, Static Member. Inheritance Extending a Class (Defining a subclass Constructor, Multilevel inheritance, Hierarchical inheritance, Overriding Methods, Final variable and Methods, Final Classes, Abstract method and Classes . Visibility Control:- Public access, friend access, Protected access, Private access, Private Protected access. Array, Strings and Vectors:- Arrays, One Dimensional array, Creating an array, Two Dimensional array, Strings, Vectors, Wrapper Classes. Interfaces and Packages:- Interface: Multiple Inheritance Defining interfaces, Extending interfaces, Implementinginterfaces, Accessing Interface variable. Packages: Putting Classes Together System Package, Using system Package, Naming Convention, Creating Package, Accessing a package, Using a package, adding a class to a package .

MODULE-3

Multithreaded Programming and Exception handling:-   12 hrs

Multi Threading: Creating Thread, Extending a thread class, Stopping and Blocking a thread, Life cycle of thread, Using thread method, Thread exceptions, Thread priority, Synchronization, ManagingErrors and Exceptions Types of errors, Exception. Java Applets and Graphics Programming:- Applet Programming Local and remote applets, How applet differ from application, Preparing to write applets, Building applet code, Applet life cycle, Creating an Executable Applet, Designing a Web page, Applet tag, Adding Applet to HTML file, Running the Applet

MODULE-4

Servlets   8 hrs

Introduction, Web application and architecture, Http protocol and Http method, Web server and web container, servlet interface.

BOOKS RECOMMENDED:-

1. Programming in JAVA by E. Balagursamy by TMH publications.
2. JAVA 2 Complete BPB publications.
3. Programming in JAVA 2 by QUE (Prentice Hall) publications.
4. MCSE networking guide by BPB publications.
5. Java Complete Reference TMH

Subject   : **Java Programming Lab**
Subject Code   : **CSE512**

List of Practical's

To write a Java application program which clarify the following points.

How to compile and run, How to set path and class path, Single and Multi-line comments, and,Command line arguments. Data Types, Variables Operators & Arrays

To write a Java program which defines and initialized different data types byte, short, int, long, float& double. Problems related to Character and Boolean data type.

Problems related to one and two dimensional array. Problems related to Arithmetic, bit wise andrelational operators.

Control Statements & Looping Structure Problems related to: IF-ELSE, IF-ELSE-IF, SWITCH statements.

Problems related to the following looping statements — WHILE, DO-WHILE & FOR.

Problems related to nested looping and jump statements (BREAK, CONTINUE & RETURN) Classes, Objects & Methods

To write a Java program to clarify the following points: (a) how to declare a class, (b) how to create an object, (c) how methods are defining in a class, (d) access variables and methods.

To construct a Java program which defines: (a) how arguments values are passed to a method, (b) use of new operator, constructor and finalize) method, (c) passing objects to a method, (d) declaration of static keyword.

To practice problems related to: (a) Method overloading, (b) Multiple constructor, (c)Calling constructor from a constructor.

Exception Handling

To write a Java program which is constructed using TRY, CATCH and FINALLY blocks Inheritance & Extending Classes (Interface)

To write Java programs which clarify the following: (a) super class, (b) subclass/derive class, (c) understanding abstract and final class, (d) polymorphism.

To practice problems related to: (a) Multiple Inheritance, (b) Interface, (c) Extending Interfaces. Thread & Multi-Thread

Subject   : **Computer Graphics**
Subject Code   : CSE505
Total Hours   42
Full Marks   : 80 + 20 = 100

Module I

Introduction to computer graphics & graphics systems   6 Hrs
Overview of computer graphics, representing pictures, preparing, presenting & interacting withpictures for presentations; Visualization & image processing; RGB color model, direct coding, lookuptable; storage tube graphics display, Raster scan display, 3D viewing devices, Plotters, printers,digitizers, Light pens etc.; Active & Passive graphics devices; Computer graphics software.

Scan conversion: 6 Hrs

Points & lines, Line drawing algorithms; DDA algorithm, Bresenham's line algorithm, Circle generation algorithm; Ellipse generating algorithm; scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.

Module II

2D transformation & viewing   9 Hrs

Basic transformations: translation , rotation, scaling ; Matrix representations & homogeneous coordinates, transformations between coordinate systems; reflection shear; Transformation of points, lines , parallel lines, intersecting lines. Viewing pipeline, Window to viewport co-ordinate transformation , clipping operations , point clipping , line clipping, clipping circles , polygons & ellipse.

3D transformation & viewing   7 Hrs

3D transformations: translation, rotation, scaling & other transformations. Rotation about an arbitrary axis in space, reflection through an arbitrary plane; general parallel projection transformation; clipping, viewport clipping, 3D viewing.

Module III

Curves   5 Hrs

Curve representation, surfaces , designs , Bezier curves , B-spline curves, end conditions for periodic B-spline curves, rational B-spline curves.

Module IV

Hidden surfaces   5 Hrs

Depth comparison, Z-buffer algorithm, Back face detection, BSP tree method, the Printer's algorithm, scan-line algorithm; Hidden line elimination, wire frame methods , fractal - geometry.

Color & shading models   4 Hrs

 Light & color model; interpolative shading model; Texture;

Subject   : Computer Graphics Lab
Subject Code   : CSE513

List of Experiments :

1. Write a program for 2D line drawing as Raster Graphics Display.
2. Write a program for display basic 2D geometric primitives.
3. Write a program to display a filled square.
4. Write a program to display a series of concentric circles of varying radius.
5. Write a program for line drawing as Raster Graphics Display.
6. Write a program for circle drawing as Raster Graphics Display.
7. Write a program to draw a line using Bresenham line drawing algorithm
8. Write a program to draw a circle using Midpoint algorithm. Modify the same for drawing an arc and sector.
9. Write a program to rotate a point about origin.
10. Write a program to rotate a triangle about origin.
11. Write a program to scale the triangle using 2D transformation.
12. Write a program to translate a triangle using 2D transformation.
13. Write a program to reflect a triangle 2D transformation.
14. Write a program for polygon filling as Raster Graphics Display
15. Write a program for line clipping.
16. Write a program for polygon clipping.
17. Write a program for displaying 3D objects as 2D display using perspective transformation.
18. Write a program for rotation of a 3D object about arbitrary axis.
19. Write a program in open GL for building mouse cursors.
20. Write a program in open GL for freehand drawing using mouse.

Text Books:

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

4. Mukherjee, Fundamentals of Computer graphics & Multimedia, PHI

5. Sanhker, Multimedia –A Practical Approach, Jaico

6. Buford J. K. – "Multimedia Systems" – Pearson Education

7. Andleigh & Thakrar, Multimedia, PHI

8. Mukherjee Arup, Introduction to Computer Graphics, Vikas

9. Hill,Computer Graphics using open GL, Pearson

EducationReference Books:

1. Foley, Vandam, Feiner, Hughes – "Computer Graphics principles (2nd Ed.) – Pearson Education.

2. W. M. Newman, R. F. Sproull – "Principles of Interactive computer Graphics" – TMH.

Subject   **: Mobile Computing (Elective-II)**
Subject Code   **: CSE506**
Total Hours   **: 42**
Full Marks   **: 80 + 20 = 100**

UNIT-1

Introduction   10 hrs

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

Unit II

Mobile Network & Transport Layer   12 hrs

Mobile IP Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunnelling and encapsulation, Dynamic Host Configuration Protocol (DHCP), Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

Unit III

Wireless Networking   10 hrs

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

Unit IV

Mobile Ad hoc Networks   10 hrs

Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment, Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

Subject   : **Mobile Computing Lab (Elective-II)**
Subject Code   : **CSE514**

List of Experiments

1. Baseband communication
2. Adaptive Linear equalizer
3. CDMA multi path
4. CDMA Multiuser
5. Global System for Mobile Communication
6. GSM Wireless digital communication on digital SDR platform
7. GSM spread spectrum DSSS Modulation and demodulation
8. Free space propagation using path loss model
9. Link budget equation for sat communication
10. Carrier to noise ratio of wireless signal
11. Outdoor propagation Okumura model
12. Outdoor propagation Hata model
13. Selective retransmission
14. Tunneling and encapsulation,
15. Data broadcasting MANETs

Reference Books:

1. J. Schiller, Mobile Communications, Addison-Wesley, second edition, 2004.

2. Raj Pandya, Mobile & Personal Communication Systems and Service, PHI.

3. Asoke k Talukder , Roopa R Yavagal, Mobile Computing , Technology, Application & ServiceCreation. Tata Mc Graw Hill
4. Stojmenovic and Cacute, ―Handbook of Wireless Networks and Mobile Computing‖, Wiley

Subject   : **System Software and Administration (Elective-II)**
 Subject Code   : **CSE507**
Total Hours   42
Full Marks   : 80 + 20 = 100

Module I

System Software   **15 Hrs**

Assemblers: General design procedures, Design of two pass assemblers, Cross Assemblers, Macro Processors – Features of a macro facility,(macro instruction arguments, conditional macro expansion, macro calls within macros), Implementation of a restricted facility : A two pass algorithm; Macro Assemblers. Loader schemes: Compile and go loaders, absolute loaders, relocating loader, Linking, Reallocation- static & dynamic linking, Direct linking loaders, Binders, Overlays, dynamic binders; Working principle of Editors, Debuggers.

Module II

System Administration Introduction: **3 Hrs**

Duties of the Administrator, Administration tools, Overview of permissions. Processes: Process status, Killing processes, process priority. Starting up and Shut down: Peripherals, Kernel loading, Console, The scheduler, init and the in it tab file, Run-levels, Run level scripts.

Module III

Managing User Accounts: **2 Hrs**

 Principles, password file, Password security, Shadow file, Groups and the group file, Shells, restricted shells, user management commands, homes and permissions, default files, profiles, locking accounts, setting passwords, Switching user, Switching group, Removing users.

Module IV

Managing Unix File Systems: **2 Hrs**

 Partitions, Swap space, Device files, Raw and Block files, Formatting disks, Making file systems, Superblock, I-nodes, File system checker, Mounting file systems, Logical Volumes, Network File systems, Boot disks

Module V

Configuring the TCP/IP Networking :   **4 Hrs**

 Kernel Configuration; Mounting the /proc File system, Installing the Binaries, Setting the Hostname, Assigning IP Addresses, Creating Subnets, Writing hosts and networks Files, Interface Configuration for IP, if config, net stat command, Checking the ARP Tables; Name service and resolver configuration.

Module VI

TCP/IP Firewall :   6 Hrs

Methods of Attack, What Is a Firewall? What Is IP Filtering? Setting Up Linux for Firewalling Testing a Firewall Configuration; A Sample Firewall Configuration: IP Accounting, Configuring the Kernel for IP Accounting, Configuring IP Accounting, Using IP Accounting Results.

Module VII

IP Masquerade and Network Address Translation: 4 Hrs

Side Effects and Fringe Benefits, Configuring the Kernel for IP Masquerade, Configuring IP Masquerade. Module IV The Network Information System, Getting Acquainted with NIS, NIS Versus NIS+ , The Client Side of NIS, Running an NIS Server, NIS Server Security.

Module VIII

Network file system: 3 Hrs

Preparing NFS, Mounting an NFS Volume, The NFS Daemons, The exports File.

Module IX

System Backup & Recovery: 3 Hrs

 Log files for system and applications; Backup schedules and methods (manual and automated).

Text Books:

 1. L.L. Beck – "System Software " (3rd Ed.)- Pearson Education

 2. Michel Ticher – "PC System Programming" , Abacus.

3. Kirch – " Linux network Administrator's guide (2nd Ed.)" – O'Rielly

4. Maxwell – "Unix system administration" - TMH

5. Limoncelli –"The Practice of System & Network Administration"-Pearson

6. Wells, LINUX Installation & Administration,

VikasReference Books:

 1. W. R. Stevens – "Unix network programming, vol. 1(2nd Ed.)" – Pearson Education/PHI

 2. W. R. Stevens – "TCP/IP illustrated, vol. 1" – PHI/Pearson Education

 3. Comer – "Internetworking with TCP/IP, vol. 1(4th Ed.)" – Pearson Education/PHI

4. E. Nemeth, G. Snyder, S. Seebass, T. R. Hein – " Unix system administration handbook" – Text Books:

7. L.L. Beck – "System Software " (3rd Ed.)- Pearson Education

8. Michel Ticher – "PC System Programming" , Abacus.

9. Kirch – " Linux network Administrator's guide (2nd Ed.)" – O'Rielly

10. Maxwell – "Unix system administration" - TMH

11. Limoncelli –"The Practice of System & Network Administration"-Pearson

12. Wells, LINUX Installation & Administration, VikasReference Books:

5. W. R. Stevens – "Unix network programming, vol. 1(2nd Ed.)" – Pearson Education/PHI

6. W. R. Stevens – "TCP/IP illustrated, vol. 1" – PHI/Pearson Education

7. Comer – "Internetworking with TCP/IP, vol. 1(4th Ed.)" – Pearson Education/PHI

8. E. Nemeth, G. Snyder, S. Seebass, T. R. Hein – " Unix system administration handbook"

Subject   : System Software and Administration Lab (Elective-II)
Subject Code   : CSE515

Minimum 10 Practical's based on following themes are to be performed by

studentsPacket monitoring software (tcp dump, snort, ethereal)

Trace route, Ping, Finger, N map

Server configuration (FTP, SMTP,

DNS)NFS Configuration

Firewall Configuration using ip tables/ ip chains (Linux only)

Experiments using Turbo C Assembler Note: All the above experiments may be performed in bothUnix /Linux & Windows Object

Subject : **Advance Web Technology (Elective-I)**
Subject Code : **CSE508**
Total Hours **42**
Full Marks : **80 + 20 = 100**

Module1: **10 Hrs**

Introduction – Service Oriented Enterprise – Service Oriented Architecture (SOA) – SOA and Web Services – Multi-Channel Access – Business Process management – Extended Web Services Specifications – Overview of SOA – Concepts – Key Service Characteristics – Technical Benefits – Business Benefits

Module2: **14 Hrs**

SOA and Web Services – Web Services Platform – Service Contracts – Service Level Data Model – Service Discovery – Service-Level Security – Service-Level Interaction patterns – Atomic Services and Composite Services – Proxies and Skeletons – Communication – Integration Overview – XML and Web Services - .NET and J2EE Interoperability – Service-Enabling Legacy Systems – Enterprise Service Bus Pattern

Module3: **8 Hrs**

Multi-Channel Access – Business Benefits – SOA for Multi Channel Access – Tiers – Business Process Management – Concepts – BPM, SOA and Web Services – WSBPEL – Web Services Composition

Module4: **6 Hrs**

Java Web Services – JAX APIs – JAXP – JAX-RPC – JAXM – JAXR – JAXB

Module5: **4 Hrs**

Metadata Management – Web Services Security – Advanced Messaging – Transaction Management

Subject : **Advance Web Technology**
Subject Code : **CSE516**

List of Experiments
1. Exercise different terminology about XML.
2. Write Simple XML parser using Java (SAX) or .net (DOM).
3. Study terminology about Semantic Web.
4. Design arithmetic web service with following four basic operation.
5. Write web service in JAVA or .net.
6. Write following client in following language. Java Desktop
   ClientJava Web Client
   .net Desktop Client
   .net Web
   ClientPhp
   web client
7. Develop WSDL files and based on WSDL generator generate proxy class and make ofuse it in any client program.
8. What is REST web service? Write REST web service in java/.net
9. Design a web service for data security using DES encryption and description algorithm. Itshould have specification for:
   - Platform of execution
   - Interface
   - Message Structure
   - Performance
   - Identity Services and Complex
   ProcessesImplement it using REST
   web service.
9. Write a small SOA project.

Text Books:

1. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services", Pearson Education,2005.

2. James McGovern, Sameer Tyagi, Michael E Stevens, Sunil Mathew, "Java Web Services Architecture", Elsevier, 2003.

Reference Books:

1. Thomas Erl, "Service Oriented Architecture", Pearson Education, 2005.

2. Frank Cohen, "FastSOA", Elsevier, 2007.

Subject : **Artificial Intelligence (Elective-II)**

Subject Code : **CSE509**

Total Hours : **42**

Full Marks : **80 + 20 = 100**

MODULE-I

Introduction

Overview of Artificial intelligence- Problems of AI, AI technique, Tic - Tac - Toe

2 Hrs

problem. Intelligent Agent

Agents & environment, nature of environment, structure of agents, goal based agents, utility basedagents, learning agents.

MODULE-II

Problem Solving   2 Hrs

Problems, Problem Space & search: Defining the problem as state space search, production system,problem characteristics, issues in the design of search programs.

MODULE-III

Search techniques   5 Hrs

Computer Science & Engineering Syllabus Solving problems by searching :problem solving agents, searching for solutions; uniform search strategies: breadth first search, depth first search, depth limited search, bidirectional search, comparing uniform search strategies.

MODULE-IV

Heuristic search strategies   5 Hrs

Greedy best-first search, A* search, memory bounded heuristic search: local search algorithms & optimization problems: Hill climbing search, simulated annealing search, local beam search, genetic algorithms; constraint satisfaction problems, local search for constraint satisfaction problems. Adversarial search [3] Games, optimal decisions & strategies in games, the minimax search procedure, alpha-beta pruning, additional refinements, iterative deepening.

MODULE-V

Knowledge & reasoning   3 Hrs

Knowledge representation issues, representation & mapping, approaches to knowledge representation,issues in knowledge representation.

MODULE-VI

Using predicate logic   2 Hrs

Representing simple fact in logic, representing instant & ISA relationship, computable functions & predicates, resolution, natural deduction.

MODULE-VII

Representing knowledge using rules   3 Hrs

Procedural verses declarative knowledge, logic programming, forward verses backward reasoning, matching, control knowledge.

MODULE-VIII

Probabilistic reasoning   3 Hrs

Representing knowledge in an uncertain domain, the semantics of Bayesian networks, Dempster- Shafer theory, Fuzzy sets & fuzzy logics.

MODULE-IX

Planning   2 Hrs
Overview, components of a planning system, Goal stack planning, Hierarchical planning, otherplanning techniques.

MODULE-X

Natural Language processing   2 Hrs

 Introduction, Syntactic processing, semantic analysis, discourse & pragmatic

processing. Learning   2Hrs

Forms of learning, inductive learning, learning decision trees, explanation based learning, learningusing relevance information, neural net learning & genetic learning.

Expert Systems   2 Hrs

Representing and using domain knowledge, expert system shells, knowledge

acquisition. Basic knowledge of programming language like Prolog & Lisp.   4 Hrs

Reference Books:

1. Artificial Intelligence, Ritch & Knight, TMH

 2. Artificial Intelligence A Modern Approach, Stuart Russel Peter Norvig Pearson

3. Introduction to Artificial Intelligence & Expert Systems, Patterson, PHI

4. Poole, Computational Intelligence, OUP

5. Logic & Prolog Programming, Saroj Kaushik, New Age International

6. Expert Systems, Giarranto, VIKAS

7. Artificial Intelligence, Russel, Pearson

Subject   : Artificial Intelligence Lab (Elective-II)
Subject Code   : CSE517

List of Experiments:
1. Implementation of DFS for water jug problem using LISP /PROLOG
2. Implementation of BFS for tic-tac-toe problem using LISP /PROLOG/Java
3. Implementation of TSP using heuristic approach using Java/LISP/Prolog
4. Implementation of Simulated Annealing Algorithm using LISP /PROLOG
5. Implementation of Hill-climbing to solve 8- Puzzle Problem
6. Implementation of Towers of Hanoi Problem using LISP /PROLOG
7. Implementation of A* Algorithm using LISP /PROLOG
8. Implementation of Hill Climbing Algorithm using LISP /PROLOG
9. Implementation Expert System with forward chaining using JESS/ CLIPS
10. Implementation Expert System with backward chaining using RVD/PROLOG

Mini project on developing any Simple Expert Systems
1. A case-study on Financial planning Expert System,
2. Sale Expert system,
3. DENDRAL
4. MYCIN
5. Any Expert system of Student Choice

Subject   : Data Mining (Elective-II)
Subject Code   : CSE510
Total Hours   42
Full Marks   : 80 + 20 = 100

Module1:   **6 Hrs**
Introduction: Basic concepts of data mining, including motivation and definition; different types of data repositories; data mining functionalities; concept of interesting patterns; data miningtasks; current trends, major issues and ethics in data mining

Module2:   **6 Hrs**
Data: Types of data and data quality; Data Preprocessing: data cleaning, data integration and transformation, data reduction, discretization and concept hierarchy generation; Exploring Data:summary statistics, visualization, multidimensional data analysis

Module3:   **6 Hrs**

Association and Correlation Analysis: Basic concepts: frequent patterns, association rules - support and confidence; Frequent item set generation - Apriority algorithm, FP-Growth algorithm; Rule generation, Applications of Association rules; Correlation analysis.

Module4:   **10 Hrs**

Clustering Algorithms and Cluster Analysis: Concept of clustering, measures of similarity, Clustering algorithms: Partitioning methods - k-means and k-medoids, CLARANS, Hierarchical methods - agglomerative and divisive clustering, BIRCH, Density based methods - Subspace clustering, DBSCAN; Graph-based clustering - MST clustering; Cluster evaluation; Outlier detection and analysis.

Module5:   **8 Hrs**

Classification: Binary Classification - Basic concepts, Bayes theorem and Naive Bayes classifier, Association based classification, Rule based classifiers, Nearest neighbour classifiers, Decision Trees, Random Forest; Perceptrons; Multi-category classification; Model over fitting, Evaluation of classifier performance - cross validation, ROC curves.

Module6:   **6 Hrs**

 Applications: Text mining, Web data analysis, Recommender systems. Prerequisites: Familiarity with basic Linear Algebra and Probability will be assumed.

Text Books:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Introduction to Data Mining. Pearson(2005), India. ISBN 978-8131714720

2. Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, Morgan Kaufmann, 3rd edition (July 2011). 744 pages. ISBN 978-0123814791

3. Ian H. Witten and Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, Morgan Kaufmann, 3rd edition (January 2011). 664 pages. ISBN 978-0123748560.

Reference Books:

1. T. Hastie, R. Tibshirani and J. H. Friedman, The Elements of Statistical Learning, Data Mining, Inference, and Prediction. Springer, 2nd Edition, 2009. 768 pages. ISBN 978-0387848570

2. C. M. Bishop, Pattern Recognition and Machine Learning. Springer, 1st edition, 2006. 738 pages. ISBN 9780387310732

Subject   : Data Mining Lab (Elective-II)
Subject Code   : CSE518

Minimum 10 experiments to be done by students.

This laboratory course is a part of the course on "Data Mining". This course will give students an opportunity to learn the specifics of some open source data mining software and carry out experimentson real-world data sets. The students may be asked to do independent project work as a part of this laboratory course. In particular, the students are expected to

1. Learn to install open source data mining software such as Weka, XL Miner etc.

2. Do experiments with respect to

    a.   Data pre-processing, attribute oriented analysis and visualization

    b.   Mining association rules

    c.   Classifier design: Naive Bayes Classifier, Rule based classifiers, Decision Trees andPerceptions (both for binary and multiclass Classification), Random Forests

    d.   Evaluation of classifiers

    e.   Clustering algorithms: k-means and k-medoids, hierarchical, CLARANS, BIRCH andDBSCAN

    f.   Cluster evaluation

3. Extend the data mining algorithms implemented in open source data mining software

4.   Propose, implement and test new data mining algorithms

5.   Apply the new algorithms to some sample data sets such as KDD CUP data sets and compare themwith some existing algorithms

Subject : **E – Commerce (Elective-II)**
Subject Code : **CSE511**
Total Hours **42**
Full Marks : **80 + 20 = 100**

MODUE-I   5 Hrs

Electronic Commerce : Overview, Definitions, Advantages & Disadvantages of E – Commerce, Threats of E – Commerce, Managerial Prospective, Rules & Regulations For Controlling E – Commerce, Cyber Laws.

MODUE-II   8 Hrs

Technologies : Relationship Between E – Commerce & Networking, Different Types of Networking For E – Commerce, Internet, Intranet & Extranet, EDI Systems Wireless Application Protocol : Definition, Hand Held Devices, Mobility & Commerce, Mobile Computing, Wireless Web, Web Security, Infrastructure Requirement For E – Commerce.

MODUE-III   4 Hrs

Business Models of e – commerce : Model Based On Transaction Type, Model Based On Transaction Party - B2B, B2C, C2B, C2C, E – Governance.

MODUE-I   2 Hrs

E – strategy : Overview, Strategic Methods for developing E – commerce.

MODUE-IV   4 Hrs

Four C's : (Convergence, Collaborative Computing, Content Management & Call Centre Convergence : Technological Advances in Convergence – Types, Convergence and its implications, Convergence & Electronic Commerce. Collaborative Computing : Collaborative product development, contract as per CAD, Simultaneous Collaboration, Security.

MODUE-V   8 Hrs

Content Management : Definition of content, Authoring Tools & Content Management, Content – partnership, repositories, convergence, providers, Web Traffic & Traffic Management ; Content Marketing. Call Center : Definition, Need, Tasks Handled, Mode of Operation, Equipment , Strength & Weaknesses of Call Center, Customer Premises Equipment (CPE).

MODUE-VI   **4 Hrs**

Supply Chain Management : E – logistics, Supply Chain Portal, Supply Chain Planning Tools (SCP Tools), Supply Chain Execution (SCE), SCE - Framework, Internet's effect on Supply Chain Power.

MODUE-VII   **2 Hrs**

E – Payment Mechanism : Payment through card system, E – Cheque, E – Cash, E – Payment Threats & Protections.

MODUE-VIII   **1 Hrs**

E – Marketing :. Home –shopping, E-Marketing, Tele-marketing

MODUE-IX   **2 Hrs**

Electronic Data Interchange (EDI) : Meaning, Benefits, Concepts, Application, EDI Model, Protocols (UN EDI FACT / GTDI, ANSI X – 12), Data Encryption (DES / RSA).

MODUE-X   **2 Hrs**

Risk of E – Commerce : Overview, Security for E – Commerce, Security Standards, Firewall, Cryptography, Key Management, Password Systems, Digital certificates, Digital signatures.

Subject   **: E – Commerce Lab (Elective-II)**
Subject Code   **: CSE519**

List of Experiments:

1. A Survey-based Marketing Campaign for Ecommerce
2. Practical use of crypto currencies in e-commerce and global payments
3. Different e commerce solutions.
4. Practical e Commerce Tools You Can Use Today to Boost any Business
5. Study of Logistics and Fulfilment for e-business.
6. Case study of content marketing
7. Design Site Architecture in advance e commerce SEO.
8. Study of CASE study for
      : E business for
     tourismsState e
     tenders
     E library
     E education
9. Design social media for your own college.
10. Virtual personnel shoppers in e commerce.

Reference Books :

1.   E-Commerce,M.M. Oka, EPH

2.   Kalakotia, Whinston : Frontiers of Electronic Commerce , Pearson Education.

3.   Bhaskar Bharat : Electronic Commerce - Technologies & Applications.TMH

4.   Loshin Pete, Murphy P.A. : Electronic Commerce , Jaico Publishing Housing.

5.   Murthy : E – Commerce , Himalaya Publishing.

6.   E – Commerce : Strategy Technologies & Applications, Tata McGraw Hill.

7.   Global E-Commerce, J. Christopher & T.H.K. Clerk, University Press

8.   Beginning E-Commerce, Reynolds, SPD

9.   Krishnamurthy, E-Commerce Mgmt, Vikas

Subject Title: Development of Life Skills (Common Paper)Subject Code : 501 Full Marks : 50

Rationale:

   In today's competitive world, the nature of individual and organizations is changing at very rapid speed. In this situation the responsibility of diploma holder is not unique. After completing his course work he has to face the world and seek meaningful employment also. Merely having knowledge is not sufficient these days. He has to show his communicative skill also.   As such the individual skills with capability to show his strength and communicate his willingness new skills for further advancement with to impart his ability and acquiring has to be displayed and learned.

This subject will develop the student as an effective individual to grab the available situation and be member of the unseen team in which he may be put in . It will develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team. Such skills will enhance his capabilities in the field of searching, assimilating information, managing the given task, handling people effectively, solving challenging problems.

Objectives: The students will be able to:

1. Develop acumen to face interview.
2. Lead in the group discussion and set goals and targets for others
3. Develop team spirit i.e. concept of working in teams
2. Apply problem solving skills for a given situation
3. Use effective presentation techniques
4. Apply techniques of effective time management
5. Apply task management techniques for given projects
6. Enhance leadership traits
7. Resolve conflict by appropriate method
8. Survive self in today's competitive world
9. Follow moral and ethics
11. Convince people to avoid frustration

CONTENTS:

SOCIAL SKILLS

1. Social understanding for group discussion, imaginative thinking and develop free ideas .
2. SWOT Analysis – Concept, and know himself in details. Learn how to make use of SWOT.
3. **Inter personal Relation:-** How to effectively counter arguments of others without hearting their feeling Sources of conflict and conflict resolution, Ways to enhance interpersonal dependence and relations.
4. **Problem Solving**

   I)   STEPS IN PROBLEM SOLVING,
   1) Identify and clarify the problem,
   2) Information gathering related to problem,
   3) Evaluate the evidence,
   4) Consider alternative solutions and their implications,
   5) Choose and implement the best alternative,
   6) Review

   II) Problem solving technique.(any one technique may be considered)
   1) Trial and error
   2) 2) Brain storming
   3) 3) Lateral thinking

5. **Presentation Skills**

Body language --
Dress like the audience, Posture, Gestures, Eye contact and facial expression. STAGE FRIGHT,
Voice and language – Volume, Pitch, Inflection, Speed, Pause, Pronunciation, Articulation, Language, Practice of speech. Use of presentation aids, Summarizing the facts

6. **Group discussion** –

Introduction to group discussion, Ways to carry out group discussion, Parameters—Contact, body language, analytical and logical thinking, decision making

7. **INTERVIEW TECHNIQUE**
Necessity, Techniques to influence interviews and giving directions, Tips for handling common questions.

8. **Working in Teams**
Understand and work within the dynamics of a groups.
Tips to work effectively in teams,
Establish good rapport, interest with others and work effectively with them to meet common objectives,
Tips to provide and accept feedback in a constructive and considerate way ,
Leadership in teams, Handling frustrations in group.

9. **Task Management**
Introduction, Task identification, Task planning ,organizing and execution, Closing the task

REFERENCE BOOKS:

Sr. No	Title of the book	Author	Publisher
1	Adams Time management	Marshall Cooks	Viva Books
2	Basic Managerial Skills for All	E.H. Mc Grath , S.J.	Pretice Hall of India
3	Body Language	Allen Pease	Sudha Publications Pvt.
4	Creativity and problem solving	Lowe and Phil	Kogan Page (I) P Ltd
5	Decision making & Problem Solving	by Adair, J	Orient Longman
6	Develop Your Assertiveness	Bishop , Sue	Kogan Page India
7	Make Every Minute Count	Marion E Haynes	Kogan page India
8	Organizational Behavior	Steven L McShane and Mary Ann Glinow	Tata McGraw Hill
9	Organizational Behavior	Stephen P. Robbins	Pretice Hall of India, Pvt Ltd
10	Presentation Skills	Michael Hatton (Canada – India Project)	ISTE New Delhi
11	Stress Management Through Yoga and Meditation	--	Sterling Publisher Pvt Ltd
12	Target setting and Goal Achievement	Richard Hale ,Peter Whilom	Kogan page India
13	Time management	Chakravarty, Ajanta	Rupa and Company
14	Working in Teams	Harding ham .A	Orient Longman

INTERNET ASSISTANCE

1. http://www.mindtools.com
2. http://www.stress.org
3. http://www.ethics.com
4. http://www.coopcomm.org/workbook.htm
5. http://www.mapfornonprofits.org/
6. http://www.learningmeditition.com http://bbc.co.uk/learning/courses/
7. http://eqi.org/
8. http://www.abacon.com/commstudies/interpersonal/indisclosure.html
9. http://www.mapnp.org/library/ethics/ethxgde.htm
10. http://www.mapnp.org/library/grp_cnfl/grp_cnfl.htm
11. http://members.aol.com/nonverbal2/diction1.htm
12. http://www.thomasarmstron.com/multiple_intelligences.htm
13. http://snow.utoronto.ca/Learn2/modules.html
14. http://www.quickmba.com/strategy/swot/

Scheme of Teaching and Examination for
6th Semester of 3 Years Diploma in Computer Science & Engineering

Duration of Semester   **:**   **14 Weeks**

Student Contact Hours   **:**   **36 Hrs**

Total Marks   **:**   **800**

Sl. No.	Name of Subject	Subject Code	Subject	Teaching Scheme			Examination Scheme					
				L	T	P	Hours of Exam	Full Marks of Subject	Final Exam / committee marks	Internal Assessment	Pass Marks Final / Ext. Exam	Pass Marks in Subjects
1.	Industrial Engineering & Management	601	Theory	3	-	-	3	100	80	20	26	40
2.	Network Security	CSE 604	Theory	3	-	-	3	100	80	20	26	40
3.	Software Engineering & Tools	CSE 605	Theory	3	-	-	3	100	80	20	26	40
4.	Elective III	CSE 606/607/608	Theory	3	-	-	3	100	80	20	26	40
5.	Elective IV	CSE 609/610/611	Theory	3	-	-	3	100	80	20	26	40
6.	Network Security Lab	CSE 612	Sessional	-	-	2	-	50	30	20	-	25
7.	Software Engineering & Tools Lab	CSE613	Sessional	-	-	2	-	50	30	20	-	25
8.	Elective III Lab	CSE 614/615/616	Sessional	-		2	-	50	30	20	-	25
9.	Elective IV Lab	CSE 617/618/619	Sessional	-		2	-	50	30	20	-	25
10	Project Work	603	Sessional	-	-	4	-	50	30	20	-	25
11	Professional Practices	602	Sessional	-	-	4	-	50	30	20	-	25
	Total Hours of Teaching per week :			**15**		**16**						

Elective III (Image Processing- CSE-606/ Cloud Computing-CSE 607/UML -CSE 608) Elective IV (Animation & Multimedia- CSE609/Script Programming- CSE 610/IoT-CSE-611)

Total Marks: **Theory**   **:**   **Practical**   **:**   **Sessional**   **:**

       L   **:**   **Lecture,**   **T**   **:**   **Tutorial**   **P**   **:**

Note: 1. Period of Class hours should be of 1 hrs duration as per AICTE norms.

2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.

3. Drawing / Graphics / Practical / Sessional examinations will be held at parent institution.

4. Board will depute examiner for Practical examination.

5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

Subject : **Industrial Engineering & Management (Common Paper)Subject Code 601**

Full Marks : 80+20= 100

L	T	P
3	**0**	**0**

Rationale:

After completion of three years of technical training, Polytechnic students are expected to enterin to the World of Work. The business environment is altogether different and new to the students. A proper introduction and understanding of Business Processes is therefore essential for all Polytechnic students. Management is a subject which deals with basics of Management science required to understand the processes the in Industrial & Commercial environment. This will enable the students of Polytechnic to become familiar and to understand various Business Organizational structures, their functioning and the Role these technicians will have to play in these setups with responsibilities.

Industrial Engineering is concerned with the design, improvement and installation of integrated systems of people, materials, equipment and energy. Polytechnic students must be able to analyze the use and cost of the resources of the organization in order to achieve the objective,
i.e. to increase productivity, profits etc. and carryout the policies efficiently and effectively.

Objective:

The students will able to:

1. Familiarize environment in the world of work.
2. Explain the importance of management process in Business.
3. Identify various components of management.
4. Describe Role & Responsibilities of a Technician in an Organizational Structure.
5. Apply various rules and regulations concerned with Business & Social responsibilities of thetechnician.

Detailed Syllabus

MODULE-I

Productivity :   02 Hrs

Production and productivity, importance of productivity, factors affecting productivity, meansof increasing productivity.

MODULE-II

Plant Layout and Material Handling :   02 Hrs

Definition of plant layout, objectives of good plant layout, principles of plant layout, types of plant layout, flow pattern, steps in planning the layout for a new enterprise, definition of material handling, functions and principles of material handling, material handling devices.

MODULE-III

Work Study :   04 Hrs

Definition, concept and need for work study, objectives of method study and work measurement, basic procedure/steps in method study, recording technique, critical examination, principles of motion economy, stop watch procedure for collecting time study data, including performance rating and allowances, work sampling.

MODULE-IV

Production Planning and Control (PPC) :   04 Hrs

Definition and objectives of PPC, functions of PPC, routing, scheduling, loading, dispatching, production control definition and objectives, principle of sound production control system.

MODULE-V

Material, Purchase and Stores Management   04 Hrs

Definition, functions& objectives of materials management, inventory control, economic order quantity (EOQ), ABC analysis. Objectives of purchasing department, buying techniques, purchasing procedure (steps involved in one complete purchasing cycle); functions of stores department, location and layout of stores, receipt and issue of materials.

MODULE-VI

Quality Control and TQM :   04 Hrs

Meaning of quality and quality control, dimensions of quality, quality circle, concept and definition of TQM, elements of TQM, Kaizen, 5 'S' and six sigma.

MODULE-VII

Management :   **04 Hrs**

Various definition, concept of management, levels of management, administration and management, scientific management by F. W. Taylor. Principles of management (14 principles of Henry Fayol). Functions of management - planning, organizing, coordinating, directing, controlling, decision making.

MODULE-VIII

Organizational Management :   **04 Hrs**

Organization - definition, steps in forming organization. Types of organization. Types of organization - line, line and staff, functions, project type. Departmentation- Organized and decentralized, authority and responsibility, span of control (management). Forms of ownership - proprietorship, partnership, joint stock company, co-operative society, govt. sector.

MODULE-IX

Human Resource Management :   **06 Hrs**

Personnel Management – Introduction, definition, function. Staffing – Introduction to HR, Introduction to HR Planning, Recruitment procedure. Personnel- Training & Development – Types of training, Induction, Skill enhancement. Leadership & Motivation – Leadership- Styles & types, Motivation- Definition, Intrinsic, &Extrinsic, Moslow's theory of Motivation and its significance. Safety Management – Causes of accident, Safety Procedures. Introduction, Objectives & feature of Industrial Legislation such as – Factory act, ESI act, Workman compensation act, Industrial dispute act and salary & wages.

MODULE-X

1. **<u>Financial Management :</u>**   **04 Hrs**

Financial Management- Objectives & Functions. Capital Generation & Management- Types of capitals, Sources of finance. Budgets and accounts- Types of budgets, Production budget (including varience report), Labour budget, Introduction to Profit & Loss Accounts (Only concept), Balance sheet etc.

MODULE-XI

2. **<u>Entrepreneurship :</u>**   **04 Hrs**

Concept and definition of entrepreneur and entrepreneurship, factors influencing entrepreneurship, entrepreneurial characteristics, need for promotion of

entrepreneurship and small scale industries, steps in setting up a small scale industrial enterprise.

References Books :

1. Industrial Engineering and Management by O. P. Khanna
2. Industrial Engineering and Production Management by M. Mahajan.Publisher :Dhanpat Rai Publication (P) Ltd. New Delhi

3. Business Administration and Management by Dr. S. C. SaksenaPublisher :Sahitya Bhawan, Agra.

Subject : Network Security
Subject Code : CSE604
Total Hours 42
Full Marks : 80 + 20 = 100

Detailed Syllabus

MODULE-1 04 Hrs
Introduction
Internet Architecture, How the Internet works (high-level overview), IP Address

MODULE-II 10 Hrs
TCP/IP Protocols, Vulnerabilities, Attacks, and Countermeasures

Physical Layer: jamming attacks, Data Link Layer: ARP protocol and ARP cache poisoning, Network Layer: IP protocols, packet sniffening, IP Spoofing, IP fragmentation attacks, Network Layer: ICMP protocol and ICMP misbehaviors, Network Layer: IP Routing protocols and Attacks, Transport Layer: TCP protocol, TCP session hijacking, reset and SYN flooding attacks, DoS and DDoS attacks, DNS protocol, attacks, and DNSSEC, BGP protocoland Attacks.

MODULE-III 12 Hrs
Cryptography basics and applications

 Introduction to Cryptography, Security Threats, Vulnerability, Active and Passive attacks, Security services and mechanism, Conventional Encryption Model, Dimensions of Cryptography, Classical Cryptographic Techniques Block Ciphers (DES, AES), Feistal Cipher Structure, Simplifies DES, DES, Double and Triple DES, Block Cipher design Principles, AES, Modes of Operations. Principles Of Public-Key Cryptography, RSA Algorithm, Key Management, Diffie- Hellman Key Exchange, Elgamal Algorithm, Elliptic Curve Cryptography.

MODULE-IV 10 Hrs
Security in Networks

Threats in networks, Network Security Controls – Architecture, Encryption, Content Integrity, Strong Authentication, Access Controls, Wireless Security, Honeypots, Traffic flowsecurity, Firewalls – Design and Types of Firewalls, Personal Firewalls, Bypassing firewalls, IDS, Email Security – PGP, S/MIME,

MODULE-V 6 Hrs

1. Digital Signatures, Blockchains and Bitcoins, Virtual Private Network, Emerging Threats,Responding to Attacks, Case Studies: common mistakes.   6 Hrs

Subject   : Network Security lab
Subject Code   : CSE612

List of Experiments:

1. W.A.P. to implement Ceaser Cipher
2. W.A.P. to implement Affine Cipher with equation c=3x+12
3. W.A.P. to implement Playfair Cipher with key ldrp
4. W.A.P. to implement polyalphabetic Cipher
5. W.A.P. to implement Auto Key Cipher
6. W.A.P. to implement Hill Cipher. (Use any matrix but find the inverse yourself)
7. W.A.P. to implement Rail fence technique
8. W.A.P. to implement Simple Columner Transposition technique
9. W.A.P. to implement Advanced Columner Transposition technique
10. W.A.P. to implement Euclidean Algorithm
11. W.A.P. to implement Advanced Euclidean Algorithm
12. W.A.P. to implement Simple RSA Algorithm with small numbers

Reference Books :

1. Atul Kahate, "Cryptography and Network Security", Tata McGrew Hill, 2003

2. William Stallings, "Cryptography and Network Security: Principles and Practice",Prentice Hall, New Jersey.

3. Johannes A. Buchman, "Introduction to Cryptography", 2nd Edition, Springer, 2004

4. Serge Vaudenay, "Classical Introduction to Cryptography – Applications for Communication Security", Springer, 2006

5. Modern Cryptography: Theory and Practice, by Wenbo Mao, Prentice Hall PTR

6. Network Security Essentials: Applications and Standards, by William Stallings. PrenticeHall

Subject : **Software Engineering & Tools**
Subject Code : **CSE605**
Total Hours 42
Full Marks : **80 + 20 = 100**

Module I

Overview of System Analysis & Design , Business System Concept, System Development Life Cycle, Waterfall Model , Spiral Model, Feasibility Analysis, Technical Feasibility, Cost-Benefit Analysis, COCOMO model.   **10 Hrs**

Module II

System Requirement Specification – DFD, Data Dictionary, ER diagram, Process Organization &Interactions.

System Design – Problem Partitioning, Top-Down And Bottop-Up design ;Decision tree, decisiontable and structured English; Functional vs. Object- Oriented approach.   **06 Hrs**

Module III

Coding & Documentation - Structured Programming, OO Programming, Information Hiding, Reuse,System Documentation.
Testing – Levels of Testing, Integration Testing, Test case Specification, Reliability Assessment . ,Validation & Verification Metrics, Monitoring & Control.   **06 Hrs**

Usability Testing

User Interface Testing: What makes a Good UI? , Follows standards or Guidelines, Intuitive,Consistent, Flexible, Comfortable, Correct, Useful. Testing for the Disabled: Accessibility Testing:
- It's the Law, accessibility features in software.   **06 Hrs**

Web site Testing

Web Page Fundamentals, Black-Box Testing: - Text, Hyperlinks, graphics, forms, object and other simple miscellaneous Functionality. Gray Box Testing, Black box testing, White Box Testing, Configuration and compatibility testing, Usability Testing, Introducing Automation

Module IV
Software Project Management – Project Scheduling , Staffing, Software Configuration Management, Quality Assurance, Project Monitoring.   **06 Hrs**

The Future Software Quality Assurance : Quality is free, testing and quality assurance in the workplace , software testing , Quality Assurance, other names for software testing groups, Test management and organizonal structures, Capability Maturity Model (CMM), ISO 9000 CASE TOOLS : Concepts, use and application.   **08 Hrs**

Your Careers As a Software Tester: Your job as a software tester, finding software testing position, gaining hands-on experience, Internet links, Professional Organizations.

Subject   : **Software Engineering & Tools Lab**
Subject Code   : **CSE613**

List of Practical's

1. To identify the role of the software in today's world across a few significantDomains related to day to day life.
2. To identify the suitable software development model for the given scenario.

    > Background "ABC" is a new enterprise recently started by a few young entrepreneurs, intended to develop robotic systems using IT based solutions. "TENZ" is a well-established automobile manufacturing plant, Interested in automating some of the operations of the plant As first step towards automation, TENZ has decided to deploy a robotic arm to pick and place large number of bolts from one tray of a conveyer belt to another tray of a different conveyer belt. Moving one bolt at a time. TENZ has asked ABC for demonstration the robotic arm for the said purpose as a proof of concept. This is the first project being executed by ABC.TENZ would like to have a first experience of the robotic arm before signing the MOU (Memorandum of Understanding) with ABC. After MOU sign-off, TENZ would provide the complete set of requirement of the robot.
    >
    > Identify the most appropriate SDLC model for this scenario.

3. To identify the various elicitation techniques and their usage for the Banking case study.
4. Suggested domains for Mini-Project:
    a. Passport automation system.
    b. Book bank
    c. Exam Registration
    d. Stock maintenance system.
    e. Online course reservation system
    f. E-ticketing
    g. Software personnel management system
    h. Credit card processing
    i. e-book management system
    j. Recruitment system
    k. Foreign trading system
    l. Conference Management System
    m. BPO Management System

Books: Text:

1. R. G. Pressman – Software Engineering, TMH
2. Behforooz, Software Engineering Fundamentals, OUP
3. Ghezzi, Software Engineering, PHI
4. Pankaj Jalote – An Integrated Approach to Software Engineering, NAROSA.
5. Object Oriented & Classical Software Engineering(Fifth Edition), SCHACH,TMH
6. Vans Vlet, Software Engineering, SPD
7. Uma, Essentials of Software Engineering, Jaico
8. Sommerville, Ian – Software Engineering, Pearson Education
9. Benmenachen, Software Quality, Vikas

Reference:

1. IEEE Standards on Software Engineering.

2. Kane, Software Defect Prevention, SPD

Subject   : Image & Speech Processing (Elective-III)Subject Code : CSE606
Total Hours   42
Full Marks   : 80 + 20 = 100

Unit-I

Introduction to Image Processing   10 hrs

Historical background, visual perception, image formation, Elements of Storage, sampling & Quantization, Relationships between pixels-neighbors of pixel, connectivity labeling of connected components, Relations, equivalence and Transitive closure, Distance measures, Arithmetic/ Logic operation, Imaging Geometry Basic and perspective transformation stereo imaging, application of image Processing.

Unit-II

Image Enhancement   10 hrs

Spatial and frequency domain methods point processing, intensity transformation, Histogram processing image substation and Averaging spatial filtering, LP, HP and homo-morphic felling, generation of spatial marks, Color image processing.

Unit-III

Image Compression   6 hrs

Redundancy models, error free compression, Lossy compression, Image compression

standards.

Unit-IV

Image Segmentation   6 hrs

 Detection of Discontinuity, Edge detection, Boundary detection, Thresholding, Regional oriented segmentation, use of motion in segmentation.

Unit-V
Speech Processing   10 hrs

Review of human speech and Acoustic theory, nature of sound, harmonics, resonance measurement, virtual display. Music theory, pitch, duration, intervals, rhythm. Human speech production, the vocal tract, the Larynx, the source filter. Speech signal processing-the phasor mode, Fourier transfer, DFT, FFT. The hardware use of FIR & IIR filters. Software, Elements of speech Synthesisspeech Recognition-speech in the computer-human interface.

Reference Books:

1. Digital Image Processing - by Rafact Gonzalez and Richard E. Woods, Pearson Education Society.

2. Digital Image Processing - by Keenneth R Castleman, Pearson Education Society.

3. A. K. Jain, ―Fundamental of Digital Image Processing‖, PHI

4. Speech and Audio Processing for multimedia PC's - by Iain Murray

Subject   : Image & Speech Processing Lab (Elective-III)
Subject Code   : CSE614

List of Experiments

1. Display of gray scale images

2. Histogram Equalisation

3. Design of non linear filter

4. Determination of edge detection using operators

5. 2-D DFT and DCT

6. Filtering in frequency domain

7. Display of colour images

8. Conversion between colour spaces

9. DWT of images

10. Segmentation using watershed transform

Subject : **Cloud Computing (Elective-III)**
Subject Code : **CSE607**
Total Hours **42**
Full Marks : **80 + 20 = 100**

Module 1

Introduction- Shift from distributed computing to cloud computing; principles and characteristics of cloud computing- IaaS, PaaS, SaaS; service oriented computing and cloud environment **8 Hrs**

Module 2

Cloud Computing Technology-Client systems, Networks, server systems and security from services perspectives; Accessing the cloud with platforms and applications; cloud storage

9 Hrs

Module 3

Working with Cloud -Infrastructure as a Service – conceptual model and workingPlatform as a Service – conceptual model and functionalities. Software as a Service – conceptual model and working. Trends in Service provisioning with clouds **10 Hrs**

Module 4

Using Cloud Services-Cloud collaborative applications and services – case studies with calendars, schedulers and event management; cloud applications in project management.

9 Hrs

Module 5

Case studies- Microsoft Azure, Google App Engine and Open source clouds- Open- Nebula and Eucalyptus **6 Hrs**

Text Books:

1. Anthony T.Velte, Toby J.Velte and Robert E, Cloud Computing – A Practical Approach, TMH2010

2. Michael Miller, Cloud computing – Web based Applications, Pearson

Publishing, 2011Reference Books: 1. Resources from Internet /WWW.

Subject   : Cloud Computing Lab (Elective-III)
Subject Code   : CSE615

List of Experiments:

1. Create an word document of your class time table and store locally and on cloud with doc andpdf format.
2. Prepare a ppt on cloud on topic of your choice.
3. Create your resume in a neat format using Google and Zoho cloud.
4. Install OpenStack and use it as Infrastructure as a Service and use technology ownCloud.
5. Installing and using identity management feature of OpenStack.
6. Write a program for web feedusing PHP, HTML.
7. Installing and using JOSSO.
8. Installing and using security feature of ownCloud.
9. Installing and using Administrative features of ownCloud.
10. Case study on Amazon EC2.
11. Case study on Microsoft azure.
12. Mini Project :using different features of cloud computing creating owncloud for institute,organization etc.

Subject : **Unified Modelling Language (Elective-III)Subject Code** : **CSE608**
Total Hours 42
Full Marks : **80 + 20 = 100**

Content:

1. Introduction of UML: Overview, Conceptual Model of UML, Software Architecture, Software Development Life Cycle, Classes, Relationships, Common Mechanisms of UML. The importance of modelling, principles of modelling. 04 Hrs

2. Class Diagrams: Terms and Concepts, Common Modelling Techniques, Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages 08 Hrs

3. Instances, Object Diagrams, Basic Behavioural Modelling: Interactions, Use cases, Use Case Diagrams, Interaction Diagrams, Activity Diagrams. 08 Hrs

4. Advanced Behavioural Modelling: Events and Signals, State Machines, State Diagrams, Architectural Modelling: Components, Collaborations, Component Diagrams, Deployment Diagrams. 08 Hrs

5. Generate Use-case Diagram, Class Diagram, Sequence Diagram, Collaboration Diagram, Activity Diagram, State Chart Diagram, Component Diagram, Deployment Diagram for the following systems. 14 Hrs

   ☐ Student Registration System

   ☐ Courier Tracking System

   ☐ Online Shopping System

   ☐ Online Pizza ordering System

   ☐ Online Job Portal System

Subject   **: Unified Modelling Language Lab (Elective-III)**
Subject Code   **: CSE616**

List of Experiments:

1. Identify the elements and relationship by analysing the class diagram of Easy Shop RetailApplication case study.
2. To draw different UML diagrams using Rational rose software .
3. To draw different UML diagrams using Microsoft Visio software.

Text Books :

1. Ali Bahrami, - "Object –Oriented System Development" - Mc Graw Hill.

2. Rambaugh, James Michael, Blaha - "Object Oriented Modelling and Design" - Prentice Hall India/Pearson Education

Subject   **: Animation & Multimedia (Elective-IV)**

Subject Code   **: CSE609**

Total Hours   **42**

Full Marks   **: 80 + 20 = 100**

Module-1

Multimedia Elements Multimedia Application   **8 hrs**

I/P, O/P devices

Limitations of Traditional Input Device, Digital v/s Analog, Input- Pen-Input, Image Scanner, Charge Coupled Devices, MIDI, Digital Camera, Output, Display System Technology, CRT display System, Display Terminology, Flat Panel Display, Print o/ptechnology, Dye Sublimation

Evaluation of Multimedia systems

Multimedia Elements (Fasimile, Document image, photogrphics image, Geographics information system maps, Fullmotion and live video, Holographics images Fractcals). Multimedia Application(Document imaging,Image processing and Image Enchancement, OCR, Handwriting recognition, Non textual Image recognition, Fullmotion Digital Video application and Electronics messaging). Multimedia System Architecture, Evolving Tech.for Multimedia, Defining Objects for Multimedia Systems, Multimedia Data Interface Standard

Storage media

Magnetic Media Technology, Hard disk Technology, RAID, Criteria for Selection of RAID,Use of Magnetic Storage in Multimedia, Optical Media, Magneto Optical

Module-2

Architecture & Issues For Distributed Multimedia System.   **6 hrs**

Multimedia System Architecture.

Distributed Multimedia.

Synchronization, Orchestration & QOS Architecture

Framework for Multimedia System

Module-3

Compression/Decompression & File Formats   **10 hrs**

Need, Types, Evaluating & Visibility

Evaluating the Compression System, How much, Compression, How Good is Picture, How fast Does it Compress or Decompress, What H/W & S/W Does it take, Redundancy& Usability

Compression and Decompression

Types of compression, Need of Data Compression, Color
Gray Scale and Still Video Image, Color Characteristics, Color Model

Video Compression Technique

Simple Compression Technique, Interpolative, Predictive, Transfer Coding, Discrete Transfer, Statistical (Huffman, arithmetic)JPEG Compression, Requirement Addressing JPEG, Definition of JPEG Standard, Overview of JPEG Components, JPEG methodology, The discrete cosine Transfer , Quantization, Zigzag Sequence, Encoding

Introduction to Standardization of AlgorithmFile Formats

History of RIF, TIFF

TIFF Specification , TIFF structure , TIFF tag ,TIFF Implementation issues , TIFF

classesRIFF Chunks with two sub chunks , List chunk , RIFF

waveform Audio File format , RIFF MIDI

fileFormat, RIFF DIB's,

Introduction to RIFF, AVI

RIFF AVI File format, Index Chunk and Boundary condition handling for AVIfiles., AVI Indeo File Format

JPEG-objectives, Architecture,JPEG-DCT

encodingQuantization.

JPEG-stastical coding, predictive lossless coding,

JPEGperformance

MPEG-objectives, Architecture, BIT stream syntax

performanceMPEG2 & MPEG4

Module-4
Multimedia Authoring and User Interface **6 hrs**

Multi Media Authoring System and its type

Hypermedia Application Design consideration

User Interface Design

Information Access

Object Display / Playback Issues

Module-5

Distributed Multimedia Systems **6 hrs**

Components of Distributed Multimedia Systems

Distributed Client Server Operation

Multimedia Object Server

Multi Server Network topologies

Distributed Multimedia Databases

Module-6

Multimedia Tool   **6 hrs**

Introduction to Multimedia tool – Flash Creating & Modifying elements

Line tool, fill/attributes, different shapes, text tools & pen tool Selecting lines fill with arrow tool, selecting shapes, using lasso tool performing basicediting tools, selecting & deselecting elements, modifying created objects

Subject   : Animation & Multimedia Lab (Elective-IV)Subject Code : CSE617

List of Experiments:

1. Create a cycle & name each part of cycle using different styles & format & animate text.

2. Draw seed & create small plant with use of at least 4 frames.

3. Create a forest of tree with flowers & fruits from a small plant using different layers& frame transition time.

4. Create a forest of trees using the object created earlier. Also add lighting and rain effect.

5. Insert audio to relevant frames that has lighting & rain effect.

6. Convert created work into file format which can be publish on web.

7. Interfacing digital-web-cam, capturing live image & editing using web-cam software.

8. Importing & exporting images, apply different image editing tools.

9. Mini Project: Students should create a movie of minimum 2 minutes playtime usingeither Flash or 3D-MAX or MAYA software.

**Learning Resources-
Books:**

Sr. No.	Author	Title	Publication
01	Prabhat k. Andheigh, Kiran Thakrar, John F	Multimedia Systems Design	Prentice Hall of India
02	Koegel Buford	Multimedia Systems	Pearson Education
03	Katherine Ulrich	Micromedia Flash for Windows and Macintosh	Pearson Education
04	Free Halshall	Multimedia Communication	Pearson Education
05	R. Steimnetz, K.Nahrstedt	Multimedia Computing, Communication and Application	Pearson Education
06	J.D. Gibson	Multimedia Communication Directions and Innovations	Academic Press, Hardcourt India
07	J.F. Kurose, K. W.Rose	Computer Networking	Pearson Education

Subject   **: Internet of Things (Elective-IV)**
Subject Code   **: CSE611**
Total Hours   **42**
Full Marks   **: 80 + 20 = 100**

Topic Covered	Hours
Concept of working of Internet	2 hrs
Sensors and actuators introduction	4 hrs
Networking of devices and systems and concept of multimedia	4 hrs
Introduction to IOT and low interoperability for the IPv6	4 hrs
A review of IOT working across	2 hrs
RFID technology introduction and mapping and localization of RFID technology	4
hrsConcept of wave	2hrs
Performance comparison of multi hop wireless Ad Hoc network routing protocols	4 hrs
Power assignment method for Multi Sink WSN with and without outage probability constraints 2 hrsRouting in Vehicular Ad Hoc networks	2 hrs
LTE and IEEE802 protocol for vehicular networking	2 hrs
Investigation and optimization of IEEE 802 for industrial wireless networks	2 hrs
Performance analysis for slotted SCMA / CA in IEEE 802	2 hrs
Integration of wireless sensor network to IOT using different gateways	2 hrs
Communication Industrial wireless mesh network	2 hrs
Networks primitives in wireless sensor networks	2 hrs
Applications of IOT	2 hrs

Subject   : Internet of Things Lab (Elective-IV)
Subject Code   : CSE619

List of Experiments -

1. Physical and virtual Networking
2. Multimedia operation using wireless modes
3. Development of systems based on IOT technique
4. Operation of sensors through networking in wired and wireless modes
5. Operation of actuators through networking in wired and wireless modes
6. Smart board handling through wireless networks
7. GSM based evaluation of road traffic system
8. Smart town features demonstration
9. Cloud based operation
10. Case study of IOT based system.

Books

IoT Inc, Bruce Sinclair

Building the Internet of Things by M Kranze

Race Against the Machine by Erik Brynjolfsson and Andrew McAfee
Internet of Things: Principles and Paradigms by Rajkumar Buyya (Editor), Amir Vahid Dastjerdi (Editor)
Getting Started with the Internet of Things: Connecting Sensors and Microcontrollers to theCloud by Cuno Pfister (Author)

Enterprise IoT: Strategies & Best Practices for Connected Products & Services by by Dirk Slama (Author), Fran Puhlmann (Author), JimMorrish (Author), RishiM Bhatnagar (Author)

The Ultimate Introduction to IoT by leverage

Subject : **Script Programming**
Subject Code : **CSE 610**
Total Hours : **42**
Full Marks : **80 + 20 = 100**

Module1: Introduction to Script programming in Linux and MS-Windows Perl programming

10 Hrs

Module2: Python programming   **8 Hrs**

Module3: Php programming   **8 Hrs**

Module4: Windows Power shell programming   **8 Hrs**

Module5: Applications development with Client/server architecture, graphs, GUI and graphics programming using script languages searching and search engine development using script languages.

8 Hrs

List of Experiments

Students are to undertake minimum 4 programs each in Python, php and Window shell programming.

    Text Books:

1. Programming Perl, 3rd Edition By Larry Wall, Tom Christiansen, Jon Orwant O'Reilly 2000
2. Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress, 2008, ISBN 1-59059-982-9
3. PhP 5 Power programming available at: http://ptgmedia.pearsoncmg.com/images/013147149X/ downloads/013147149X_book.pdf
4. Professional Windows Power Shell Programming ISBN: 978-0-470-17393-0
Wrox bookProfessional

Subject   : Professional Practices (Common Paper)Subject Code   : 602

Rationale:

        Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

        While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

        The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so thatthere will be increased participation of students in learning process.

Activities to be undertaken:

Students are expected to undertake these activities:

1.   Acquire information from different sources (Print and electronic) on the topics of specialization and related to the subjects of II and final year. The class is to be divided ingroups of not more than five to six students in a group and all groups are to be allotted topic of their choice. The topic should not be repeated to other group for originality of work to be performed by the group. This activity will develop interdependence and leadership among the students.

2.   Prepare notes for given topic at point no 1. The notes will be in form of a project report, having all the sections of report. The report should not be of 30 – 50 pages.

3.   Prepare presentation and Present the learning and finding on given topic in a seminar. The presentation should be prepared in Power Point module having more than 25 slides. All students should be asked to deal with suitable parts decided by the group itself.

4.   Interact with peers to share thoughts. After the final presentation the students should be encouraged to interact with the faculty members, students' fellows and other experts for suggestions and advanced and structured learning.

5.   Undertake industrial visit of their area and choice. Prepare a report on industrial visit. Expert lectures on the topic selected may be invited for the students and these expert lectures also the students should be asked to prepare a report and present the same in seminar or have a group discussion before the expert and faculty members.

6.   Develop entrepreneurial traits. Students group may be asked to have a field survey and product assessment and analysis for a product of their choice. Prepare a report for all theinputs of their requirement and submit it for evaluation.

7.   To prepare for start ups. Expert lectures for exploring this option may be arranged as this isalso a viable option and much talked about option for self employment and avail the encouragement by the government.

Based on the above rationales students will advised to develop traits under guidance of dedicatedfaculty members / mentors.