RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

DIPLOMA IN COMPUTER SCIENCE

(DIPLOMA CS)

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Scheme

Semester -I

(Common to all Branches)

Credit System and Marks Distribution:-

Semester-I

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
1	BSC	DE101	Applied Chemistry	3	0	0	3	30	70	21	100	35
2	BSC	DE102	Mathematics - I	3	0	0	3	30	70	21	100	35
3	Iuminities & Social Sc. Courses	DE103	Communication Skills in English	2	0	0	2	30	70	21	100	35
4	BSC	DE104	Applied Physics	3	0	0	3	30	70	21	100	35
5	ESC	DE105	Fundamentals of Computer	2	0	0	2	30	70	21	100	35
6	ESC	DE106	Engineering Graphics	2	0	0	2	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	BSC	DE151	Applied Chemistry Lab	0	0	2	1	30	20		50	25
2	Iuminities & Social Sc. Course	DE153	Communication Skills in English	0	0	2	1	30	20		50	25
3	BSC	DE154	Applied Physics Lab	0	0	2	1	30	20		50	25
4	ESC	DE155	Fundamentals of Computer Lab	0	0	2	1	30	20		50	25

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5	ESC	DE156	Engineering Graphics Lab	0	0	3	1.5	30	20		50	25
6	ESC	DE157	Workshop / Manufacturing Practices Lab	0	0	3	1.5	30	20		50	25
TOTAL							**22**					

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Semester -II

(Common to all Branches)

Credit System and Marks Distribution:-

Semester-II

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
1	BSC	DE201	Mathematics – II	3	0	0	3	30	70	21	100	35
2	BSC	DE202	Applied Physics – II	3	0	0	3	30	70	21	100	35
3	ESC	DE203	Fundamentals of Electrical & Electronics Engineering	2	0	0	2	30	70	21	100	35
4	ESC	DE204	Engineering Mechanics	2	0	0	2	30	70	21	100	35
5	Humanities & Social Sc. Course	DE205	Communication Skills in English II	3	0	0	3	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	BSC	DE252	Applied Physics –II Lab	0	0	2	1				50	25
2	ESC	DE253	Fundamentals of Electrical & Electronics Engineering Lab	0	0	2	1				50	25
3	ESC	DE254	Engineering Mechanics Lab	0	0	2	1				50	25
TOTAL							**16**					

Computer Science & Engineering

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Scheme

Semester -III

Credit System and Marks Distribution:-

Semester-III

SL. No.	Category	Subject Code	Subject Name	Periods L	Periods T	Periods P	Credits	Internal Max	External Max	External Min	Total Max	Total Min
1	BSC	DE301	Mathematics – III	3	0	0	3	30	70	21	100	35
2	PCC	DCSE302	Data Structure	3	0	0	3	30	70	21	100	35
3	PCC	DCSE303	Programming in C	3	0	0	3	30	70	21	100	35
4	PCC	DCSE304	Data Communication	3	0	0	3	30	70	21	100	35
5	PCC	DCSE305	Operating System	2	1	0	3	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	PCC	DCSE352	Data Structure Lab	0	0	2	1				50	25
2	PCC	DCSE353	Programming in C Lab	0	0	2	1				50	25
3	PCC	DCSE354	Operating System Lab	0	0	2	1				50	25
5			Summer Internship (4 weeks) after 2nd sem	0	0	4	2				50	25
TOTAL							**20**					

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Scheme

Semester -IV

Credit System and Marks Distribution:-

Semester-IV

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
				L	T	P		Internal	External		Total	
								Max	Max	Min	Max	Min
1	PCC	DCSE401	Object oriented Programming with C++	3	0	0	3	30	70	21	100	35
2	PCC	DCSE402	Computer Architecture	3	0	0	3	30	70	21	100	35
3	PCC	DCSE403	Database Management System	3	0	0	3	30	70	21	100	35
4	PCC	DCSE404	Software Engineering	3	0	0	3	30	70	21	100	35
5	PEC-I			3	0	0	3	30	70	21	100	35
6	PEC-II			3	0	0	3	30	70	21	100	35
Program Elective-I (Choose any one)												
1	PEC	DCSE405 (E)	Network Security	3	0	0	3	30	70	21	100	35
2	PEC	DCSE406 (E)	Analog and Digital Communication	3	0	0	3	30	70	21	100	35
3	PEC	DCSE407 (E)		3	0	0	3	30	70	21	100	35
Program Elective-II (Choose any one)												
1	PEC	DCSE408 (E)	Linux& Shell Programming	3	0	0	3	30	70	21	100	35

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2	PEC	DCSE409 (E)	Introduction to Graph Theory	3	0	0	3	30	70	21	100	35
3	PEC	DCSE410 (E)		3	0	0	3	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	PCC	DCSE451	Object oriented Programming with C++ Lab	0	0	2	1				50	25
2	PCC	DCSE452	Database Management System Lab	0	0	2	1				50	25
3	PEC-II Lab	DCSE454		0	0	2	1					
4			Minor Project	0	0	4	2				50	25
5			Essence of Indian Knowledge & Tradition	0	0	0	0				50	25
TOTAL							**22**					

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Scheme

Semester -V

Credit System and Marks Distribution:-

Semester-V

SL. No.	Category	Subject Code	Subject Name	L	T	P	Credits	Internal Max	External Max	External Min	Total Max	Total Min
1	PCC	DCSE501	Web Technology	2	1	0	3	30	70	21	100	35
2	PCC	DCSE502	Java Programming	2	1	0	3	30	70	21	100	35
3	PCC	DCSE503	Theory of Computation	3	0	0	3	30	70	21	100	35
4	PEC-III			3	0	0	3	30	70	21	100	35
5	PEC-IV			3	0	0	3	30	70	21	100	35
6	OEC-I			3	0	0	3	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	PCC	DCSE551	Web Technology Lab	0	0	2	1				50	25
2	PCC	DCSE553	Java Programming Lab	0	0	2	1				50	25
3		DCSE554	Summer Internship-II (after 4th sem)	0	0	0	2				50	25
4			Major Project-I	0	0	0	1				50	25
TOTAL							**23**					

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Elective Papers for semester-V

Program Elective-III (Choose any one)

SL No	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
1	PEC	DCSE504(E)	Data Mining	3	1	0	4	30	70	21	100	35
2	PEC	DCSE505(E)	Introduction to Soft Computing	3	1	0	3	30	70	21	100	35
Program Elective-IV (Choose any one)												
1	PEC	DCSE507(E)	Cloud Computing	3	0	0	3	30	70	21	100	35
2	PEC	DCSE508(E)	Introduction to Python Programming	3	0	0	3	30	70	21	100	35
Open Elective-I (Choose any one)												
1	OEC	DCSE510(E)	Electronic device & circuits	3	0	0	3	30	70	21	100	35
2	OEC	DCSE511(E)	Cyber Law	3	0	0	3	30	70	21	100	35

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)
Scheme
Semester -VI

Credit System and Marks Distribution:-

Semester-VI

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
1	PCC	DCSE601	Introduction to AI	3	1	0	3	30	70	21	100	35
2	Humanities & social Sc. Course	DCSE602	Entrepreneurship	3	1	0	3	30	70	21	100	35
3	Mandatory Course	DCSE603	Hardware Installation and Maintenance	0	0	0	3	30	70	21	100	35
4	PCC		System Analysis and Design	3	0	0	3	30	70	21	100	35
5	OEC-II			3	0	0	3	30	70	21	100	35

PRACTICAL DEMONSTRATION

1		DCSE553	AI Lab	0	0	2	1					
2		DCSE554	Hardware Installation and Maintenance Lab	0	0	2	1				50	25
3		DCSE655	Seminar	0	0	2	1				50	25
4	OEC-II	DCSE656		0	0	2	1				50	25

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	Lab											5
5	OEC-III Lab	DCSE657		0	0	2	1				50	2 5
TOTAL							**20**					

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Elective Papers for semester-VI

Open Elective-II (Choose any one)

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
1	OEC	DCSE 604(E)	Microprocessor and interface	3	0	0	3	30	70	21	100	35
2	OEC	DCSE 605(E)	Wind and Solar Energy Systems	3	0	0	3	30	70	21	100	35
Open Elective-III (Choose any one)												
1	OEC	DCSE 607(E)	PLC & SCADA	3	0	0	3	30	70	21	100	35
2	OEC	DCSE 608(E)	Remote Sensing and GIS	3	0	0	3	30	70	21	100	35

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)
Semester-I

(Common to all Branches)

Course Code	DE101
Course Title	Applied Chemistry
Credits	3 (L: 3 T: 0 P: 0)

Course Objectives:

1. The students will acquire a foundation in chemistry of sufficient breadth and depth to enable them to understand and critically interpret the primary chemical literature.
2. The students will develop the ability to effectively communicate scientific information and research results in written and oral formats
3. The students will learn professionalism, including the ability to work in teams and apply basic ethical principles.

UNIT 1

Atomic Structure and Chemical Bonding:

Atomic Structure: Definition of atom, Fundamental particles of atom –electron, neutron, protons, Definition of Atomic no, Atomic mass no Isotopes &Isobars,& their distinction with suitable examples, Bohr's and

Rutherford's theory; Definition and Shape of the orbital & distinction between orbits and orbitals, Hund's Rule, filling up the orbital's by Aufbau's principle (till Atomic no. 30) Chemical bonding: Cause of chemical bonding, types of bonds: electrovalent, covalent and coordinate bonds, formation of electrovalent & covalent compounds Eg. $NaCl$, $CaCl_2$, CO_2, Cl_2, NH_3, C_2H_4, N_2, C_2H_2, etc., coordination bond in NH_4^+, and anomalous properties of NH_3, HO_2 due to hydrogen bonding, and metallic bonding, Octet rule, Duplet rule.

UNIT 2

Water and Corrosion:

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. 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 Galvanizing, Tinning, Metal Spraying, Sherardizing, Electroplating and Metal Cladding.

UNIT 3

Electrochemistry and Electrochemical Cells:

Electrochemistry: Definition of terms: Conductors, Insulators, Dielectrics, Electrolyte, Non- Electrolyte, Electrolysis, Electrolytic Cell with suitable examples, Electrolytic dissociation, Arrhenius Theory of Ionization, Degree of Ionization & factors affecting degree of ionization. Redox reactions. Faradays laws of electrolysis and simple numerical problems. Electrochemical cells: Concept of electrode potential such as reduction potential & oxidation potential. Electrochemical Series, Electrolysis of $CuSO_4$ Solution by using Cu Electrode & Platinum Electrode, Electrochemical Cells & Batteries, Definition, types such as Primary & Secondary Cells & their examples.

UNIT 4

Lubricants and Fuels:

Lubricants: 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 Fuels: Definition and combustion of fuel, classification of

fuels, calorific values (HCV and LCV), calculation of HCV and LCV using Dulong's formula. Proximate analysis of coal solid fuel petrol and diesel - fuel rating (octane and cetane numbers), Chemical composition, calorific values and applications of LPG, CNG, water gas, coal gas, producer gas and biogas.

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UNIT 5

Metals and Non - Metallic Materials:

Metals: Occurrence of Metal such as Iron, Aluminum, Chromium, Nickel, Tin, their properties Definition of Metallurgy Mineral, Ore Gangue Flux & Slag, stages of Extraction of metal from Its Ores in detail. Alloys: definition of alloy, purposes of making alloy. preparation methods, General Principal of metallurgy, minerals/ ores, ore dressing, roasting, smelting, bessemerization, fluxes, purification. Explanation of alloying purposes, methods of preparation, composition and uses of alloy like brass, bronze, duralumin, German silver, gun metal, solder, stainless steel, casting and bearing alloy. Nonmetallic materials: Definition of Polymers, formation of Polymers by Addition & condensation polymerization. Properties and uses of PVC, polyethene, polystyrene, polyamides, polyesters, Bakelite. Synthetic fibers – nylon, rayon, decron, and polyesters. Natural Rubber rubber its processing and drawbacks, vulcanization of rubber with chemical reaction, synthetic rubber, definition & distinction between natural &synthetic rubber Thermal insulating material : definition & characteristics of thermal insulator. Preparation, properties & application of thermocol & glass wool Properties & application of Asbestos cork

Text Books:

1. Text Book of Chemistry for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi, 2017-18. TEXT

Reference Books

1.   Engineering Chemistry Jain & Jain, Dhanpat Rai and Sons**;** New Delhi, 2015
2.   Engineering Chemistry S. S. Dara & Dr.S.S.Umare, S. Chand Publication; New Delhi,2015.

3.   Industrial Chemistry B. K. Sharma, Goel Publication

4.   Engineering Chemistry By O P Agarwal (Khanna Publication)

5.   Environmental Chemistry & Pollution Control S. S. Dara, S. Chand Publication

6.   Chemistry for Engineers Agnihotri, Rajesh, Wiley India Pvt. Ltd., 2014.

7.   Engineering Chemistry Rao and Agarwal

8.   Engineering Chemistry P.C. Jain

9.   Applied Chemistry H.N. Sahni

10.   Polytechnic Chemistry Vedprakash Mehta, Jain brothers.

11.   Engineering Chemistry Uppal

Course Outcomes:

1. Students will be able to do when they successful complete a learning experiences whether it is project, course or program; typically, we divide their course into smaller units such. Modules, map work, flowchart etc.

As a, general rules applied, as the level of analysis becomes smaller, from coures to module toassignment. Students will be able to function as a member of an interdisciplinary problems solving team

Students will be appreciate the central role of chemistry in our society and we use this as a basis for ethical behavior in issues facing chemists including an understanding of safe handlingof chemical, environmental issues and key issues facing our society in energy health and medicine.

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Course Code	DE151
Course Title	Applied Chemistry Lab
Credits	1 (L: 0 T: 0 P: 2)

List of Experiments:

Semester-I

(Common to all Branches)

1. Determination of Total hardness by EDTA method.

2. Determination of Total hardness by Clarke's method.

3. Determination of Flash & Fire Points by Pensky Marten Apparatus.

4. Determination of Flash & Fire Points by by Abel's Apparatus.

5. Determination of Viscosity and Viscosity index by Redwood viscometer No.1.

6. Determination of Viscosity and Viscosity index by Redwood viscometer No.2.

7. Determination of percentage of Copper in Brass by Iodometric Titration.

8. To prepare a solution of N/20 sodium carbonates and find the strength of HCl using N/20 sodium carbonate solution.

Reference Books:

1. Applied Chemistry Laboratory Practices Vol. I and Vol. II, Dr. G. H. Hugar & Prof A. N. Pathak NITTTR, Chandigarh, Publications, 2013-14. LAB.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-I

Course Code	DE102
Course Title	Mathematics-I
Credits	3 (L: 3 T: 0 P: 0)

UNIT-I

(Common to all Branches)

Trigonometry: Concept of angles, measurement of angles in degrees, grades and radians and their conversions, T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa). T-Ratios of multiple angles, sub-multiple angles (2A, 3A, A/2). Graphs of sin x, cos x, tan x and e^x

UNIT – II

Differential Calculus: Definition of function; Concept of limits. Four standard limits: Differentiation by definition of sinx and cosx, tan x, logax Differentiation of sum, product and quotient of functions. Differentiation of function of a function. Differentiation of trigonometric a inverse trigonometric functions, Logarithmic differentiation, Exponential functions.

UNIT-III

Algebra: Complex Numbers: Definition, real and imaginary parts of a Complex number, polar and Cartesian, representation of a complex number and its conversion from one form to other, conjugateof a complex number, modulus and amplitude of a complex number Addition, Subtraction, Multiplication and Division of a complex number. De-Movier's Theorem, its application.

UNIT – IV

Partial fractions: 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

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UNIT – V

Permutations and Combinations: Value of nPr and nCr

Binomial theorem: Binomial theorem (without proof) for positive integral index (expansion and general form); binomial theorem for any index (expansion without proof) first and second binomial approximation with applications to engineering problems.

Reference Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.

2. G. B. Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9th Edition, 1995.

3. Reena Garg, Engineering Mathematics, Khanna Publishing House, New Delhi (RevisedEd. 2018)

4. V. Sundaram, R. Balasubramanian, K.A. Lakshminarayanan, Engineering Mathematics,6/e., Vikas Publishing House.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Diploma Engineering Semester-I(Common to all Branches)

Course Code	DE103
Course Title	Communication skills in English
Credits	2 (L: 2 T: 0 P: 0)

UNIT -1

Application of Grammar, Verbs Tense. Do as directed (active/passive, Direct/ Indirect, affirmative/ Negative/ Assertive/ Interrogative, Question tag, remove too, use of article, preposition, conjunction, punctuation). Correct the errors from the sentences. Vocabulary Building (Synonyms/ Antonyms/ Homophones/ Use of contextual word in given paragraph)

UNIT-2

Introduction to communication Definition, Communication cycle Concept of Communication Process Formal Communication Formal: Types- a) Vertical Communication b) Horizontal Communication Informal: Types- Diagonal Communication Verbal Vs Non-Verbal Communication.

Verbal: Types a) Oral Communication b) Written Communication Non-Verbal: Types a) Body Language b) Graphic Language

UNIT-3

Principal of Effective Communication. Principal of Effective Communication, Communication barriers and how to overcome them.

UNIT-4

Developing Effective message: Thinking about purpose, knowing the audience, structuring the message, selecting proper channels, minimize barriers and facilitating feedback. (Example: Writing articles for newspapers, magazines)

Suggested books:

1. Contemporary English Grammar Structures and Composition; David Green, Macmillan
2. English Grammar and composition; R. C. Jain, Macmillan
3. Effective Technical Communication; M. Ashraf Rizvi, Tata McGraw Hill Companies
4. Developing communication Skills; Krushna Mohan, Meera Baneji, Macmillan.

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Semester-I

(Common to all Branches)

Course Code	DE104
Course Title	Applied physics-I
Credits	3 (L: 3 T: 0 P: 0)

Course Objectives:

Couse objectives- study of applied physics aims to give an understanding of physical world by observation and predictions. The course help diploma engineers to apply the basic concepts and principles to solve engineering problems and to understand different technology-based application.

Unit -1

Physical world, Units and Measurements: Physical quantities; fundamental and derived, Units and systems of units (FPS, CGS and SI units), Dimensions and dimensional formulae of physical quantities, Principle of homogeneity of dimensions, Dimensional equations and their applications (conversion from one system of units to other, checking of dimensional equations and derivation of simple equations), Limitations of dimensional analysis. Measurements: Need, measuring instruments, least count, types of measurement (direct, indirect), Errors in measurements (systematic and random), absolute error, relative error, error propagation, error estimation and significant figures.

Unit-2

Force and Motion: Scalar and Vector quantities – examples, representation of vector, types of vectors. Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only), Scalar and Vector Product, Resolution of a Vector and its application to inclined plane and lawn roller. Force, Momentum, Statement and derivation of conservation of linear momentum, its applications such as recoil of gun, rockets, Impulse and its applications. Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period, Relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical), Centripetal and Centrifugal forces with live examples, Expression and applications suchas banking of roads and bending of cyclist.

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Unit-3

Work, Power and Energy: Work Concept and units, examples of zero work, positive work and negative work Friction: concept, types, laws of limiting friction, coefficient of friction, reducing friction and its engineering applications, Work done in moving an object on horizontal and inclined plane for rough and plane surfaces and related applications. Energy and its units, kinetic energy, gravitational potential energy with examples and derivations, mechanical energy, conservation of mechanical energy for freely falling bodies, transformation of energy (examples). Power and its units, power and work relationship, calculation of power (numerical problems)

Unit-4

Rotational Motion: Translational and rotational motions with examples, Definition of torque and angular momentum and their examples, Conservation of angular momentum (quantitative) and its applications. Moment of inertia and its physical significance, radius of gyration for rigid body, theorems of parallel and perpendicular axes (statements only), Moment of inertia of rod, disc, ring and sphere (hollow and solid); (Formulae only).

Unit-5

Properties of Matter: Elasticity: definition of stress and strain, moduli of elasticity, Hooke's law, significance of stress-strain curve. Pressure: definition, units, atmospheric pressure, gauge pressure, absolute pressure, Fortin's Barometer and its applications. Surface tension: concept, units, cohesive and adhesive forces, angle of contact, Ascent Formula (No derivation), applications of surface tension, effect of temperature and impurity on surface tension. Viscosity and coefficient of viscosity: Terminal velocity, Stoke's law and effect of temperature on viscosity, application in hydraulic systems. Hydrodynamics: Fluid motion, stream line and turbulent flow, Reynold's number Equation of Continuity, Bernoulli's Theorem (only formula and numerical) and its applications.

Heat and Thermometry: Concept of heat and temperature, modes of heat transfer (conduction, convection and radiation with examples), specific heats, scales of temperature and their relationship, Types of Thermometers (Mercury thermometer, Bimetallic thermometer, Platinum resistance thermometer, Pyrometer) and their uses. Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions and relation amongst them, Co-efficient of thermal conductivity,

engineering applications.

Text Books:

1.   Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi

Reference Books:

1. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi.

2. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi

3. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi

4. Engineering Physics by DK Bhhatacharya & Poonam Tandan; Oxford University Press,New Delhi

Course Outcomes:

After undergoing this subject, the students will be able to-

1. Identify physical quantity, select their units for engineering solutions and make measurement with accuracy.

2. Describe the different forms of energy, methods of transfer of energy.

3. Represent the physical quantity as scalar and vectors to solve real life relevant problems.

4. Analyze the type of motion and apply the formulation to understand banking pf road and conservation of momentum recoil of gun etc.

5. Describe the concept of work, energy and power with their units and derive the relationshipfor work energy and power.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-I

(Common to all Branches)

Course Code	DE154
Course Title	Applied Physics-I Lab
Credits	1 (L: 0 T: 0 P: 2)

Course objectives-

The course aims to supplement the factual knowledge gained in the lecture by first hand manipulation of apparatus. This will develop scientific temper and help student to apply the basic concepts in solving engineering and technology-based problems. In addition, students geta confidence in handling equal and thus learn skill of measurements.

List of Practical:

1) To measure the length, radius of a given cylinder, a test tube using vernier caliper and find the volume of each object.

2) To determine the diameter of a wire, a solid ball using screw gauge.

3) To Verify the Ohm'slaw

4) To verify the Kirchhoff's law (kvl ans kcl)

5) To find the surface tension of a liquid by capillary rise method.

6) To determine the viscosity of a given liquid (Glycerin) by Stoke's law.

7) To verify the law of conservation of mechanical energy.

8) To measure the room temperature of hot bath using mercury Thermometer and convert it into different scale.

9) To determine the radius of curvature of concave and convex mirror using spherometer.

10)   Determine the force constant using Hook's law.

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Course Outcomes:

After undergoing this lab work, students will be able to -

1. Select the right kind of measuring tools (meter scale, screw gauge, vernier calipers etc)

2. Describe and verify the Hook's law and determine the force constant of a spring body.

3. Understand the Stoke's law and determine the viscosity of a given liquid.

4. Understand the use of thermometer to measure the temperature under different conditions and scales.

5. Understand the current and voltage relationship.

Reference Books:

1. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi.

2. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi

3. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi

4. Engineering Physics by DK Bhhatacharya & Poonam Tandan; Oxford University Press,New Delhi

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Semester-I

(Common to all Branches)

Course Code	DE105
Course Title	Fundamentals of Computer
Credits	2(L: 2 T: 0 P: 0)

Unit- 1

Basic Internet skills: Understanding browser, efficient use of search engines, awareness about Digital Indie portals (state and national portals) and college portals. General understanding of various coin puter hard ware Com ponents — CPU, Memory, Display, Keyboard, Mouse, HDD and other Peripheral Devices.

Unit- 2

OS lnstallation (Linux and MS Windows), Unix Shell and Commands, vi editor.HTML4, CSS, making basic personal webpage.

Unit- 3

Office Tools: Open Office Writer, Open Office Sprcadsheet (Calc), Open Office Impress.

Unit-4

Information security best practices. Class lectures will only introduce the topic or demonstrate tool,actual learning will take place in the Lab by practicing

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Semester-I

(Common to all Branches)

Course Code	DE106
Course Title	Engineering Graphics
Credits	2(L: 2 T: 0 P: 0)

UNIT – I

Basic elements of Drawing: Drawing Instruments and supporting materials: method to use them with applications. Convention of lines and their applications. Representative Fractions – reduced, enlarged and fullsize scales; Engineering Scales such as plain and diagonal scale. Dimensioning techniques as per SP-46:2003 – types and applications of chain, parallel and coordinate dimensioning. Geometrical and Tangency constructions. (Redraw the figure)

UNIT – II

Orthographic projections: Introduction of projections-orthographic, perspective, isometric and oblique: concept and applications. (No question to be asked in examination). Introduction to orthographic projection, First angle and Third angle method, their symbols. Conversion of pictorial view into Orthographic Views – object containing plain surfaces, slanting surfaces, slots, ribs, cylindrical surfaces. (use First Angle Projection method only)

UNIT – III

Isometric Projections: Introduction to isometric projections. Isometric scale and Natural scale.

Isometric view and isometric projection. Illustrative problems related to objects containing lines, circles and arcs shape only. Conversion of orthographic views into isometric view/ projection.

UNIT – IV

Free Hand Sketches of engineering elements: Free hand sketches of machine elements: Thread profiles, nuts, bolts, studs, set screws, washer, locking arrangements. (For branches other than mechanical Engineering, the teacher should select branch specific elements for free hand sketching) Free hand sketches of orthographic view (on squared graph paper) and isometric view (on isometric grid paper)

UNIT – V

Computer aided drafting interface: Computer Aided Drafting: concept. Hardware and various CAD software available. System requirements and understanding the interface. Components of AutoCAD software window: Title bar, standard tool bar, menu bar, object properties tool bar, draw tool bar, modify tool bar, cursor cross hair. Command window, status bar, drawing area, UCS icon

File features: new file, Saving the file, opening an existing drawing file, Creating templates, Quit. Setting up new drawing: Units, Limits, Grid, Snap. Undoing and redoing action.

Unit – VI

Computer aided drafting: Draw basic entities like Line, Circle, Arc, Polygon, Ellipse, Rectangle, Multiline, Poly Line. Method of Specifying points: Absolute coordinates, Relative Cartesian and Polar coordinates. Modify and edit commands like trim, extend, delete, copy, offset, array, block, layers. Dimensioning: Linear, Horizontal Vertical, Aligned, Rotated, Baseline, Continuous, Diameter, Radius, Angular Dimensions. Dim scale variable.

Editing dimensions. Text: Single line Text, Multiline text. Standard sizes of sheet. Selecting Various plotting parameters such as Paper size, paper units, Drawing orientation, plot scale, plot offset, plot area, printpreview.

Reference Books:

1. Bhatt, N. D. *Engineering Drawing*, Charotar Publishing House, Anand, Gujrat 2010;ISBN: 978-93- 80358-17-8

2. Dhawan, R. K. *Engineering Drawing*. S. Chand and Company, New Delhi; ISBN: 81-219-1431-0.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-I

(Common to all Branches)

Course Code	DE157
Course Title	Workshop/Manufacturing Practices Lab
Credits	1.5(L: 0 T: 0 P: 3)

Details of Practical Content:

1.   Carpentry:

(i)   Demonstration of different wood working tools / machines.

(ii) Demonstration of different wood working processes, like plaining, marking, chiseling,grooving, turning of wood etc.

(iii) One simple job involving any one joint like mortise and tenon dovetail, bridle, half lapetc.

2.   Fitting:

(i)   Demonstration of different fitting tools and drilling machines and power tools

(ii) Demonstration of different operations like chipping, filing, drilling, tapping, sawing,cutting etc.

(iii) One simple fitting job involving practice of chipping, filing, drilling, tapping, cutting etc.

3.   Welding:

(i)   Demonstration of different welding tools / machines.

(ii) Demonstration on Arc Welding, Gas Welding, MIG, MAG welding, gas cutting andrebuilding of broken parts with welding.

(iii) One simple job involving butt and lap joint.

4.   Sheet Metal Working:

(i)   Demonstration of different sheet metal tools / machines.

(ii) Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering, brazing, and riveting.

(iii) One simple job involving sheet metal operations and soldering and riveting.

5. **Electrical House Wiring:**

(i) Practice on simple lamp circuits

(ii) One lamp controlled by one switch by surface conduit wiring,

(iii) Lamp circuits- connection of lamp and socket by separate switches,

(iv) Connection of Fluorescent lamp/tube light,

(v) simple lamp circuits-install bedroom lighting.

(vi) Simple lamp circuits- install stair case wiring.

6. **Demonstration:**

(i) Demonstration of measurement of Current, Voltage, Power and Energy.

(ii) Demonstration of advance power tools, pneumatic tools, electrical wiring tools andaccessories.

(iii) Tools for Cutting and drilling

References:

1. S.K. Hajara Chaudhary, Workshop Technology, Media Promoters and Publishers, New Delhi, 2015

2. B.S. Raghuwanshi, Workshop Technology, Dhanpat Rai and sons, New Delhi 2014

3. K. Venkat Reddy, Workshop Practice Manual, BS Publications, Hyderabad.

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SEMESTER -II

(Common to all Branches)

Course Code	DE201
Course Title	Mathematics-II
Credits	3(L: 3 T: 0 P: 0)

Course Objectives:

- Describe memberships of sets, including the empty set, using proper notation, and decide whether given items are members and determine the cardinality of a given set.

- Describe the relations between sets regarding membership, equality, subset, and proper subset, using proper notation.

UNIT-I

COORDINATE GEOMETRY:

- Co-ordinate System : Cartesian and Polar.
- Distance, Division, Area of a triangle.
- Locus of a point and its equation.
- **Slope of St. Line**
- Angle between two St. lines.
- Parallel and perpendicular St. lines.
- **Standard and general equation of St. line.**
- Point of intersection of two st lines.

UNIT-II

INTEGRAL CALCULUS :

- Definition as a inverse process of differentiation
- Standard Results (including inverse function)
- **Methods of Integration**
- Substitution

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- Integration by parts

- Breaking up into partial fraction

- Concept of Definite Integral

UNIT-III

NUMERICAL SOLUTION

- Bisection method, Regula-Falsi method and Newton Raphson method

- Numerical Solution of Simultaneous Equations

- Gauss elimination method Iterative methods-Gauss Seidal and Jacobi's method

UNIT-IV

STATISTICS AND PROBABILITY

- Measures of Central tendency (mean, median, mode) for ungrouped and grouped frequency distribution.

- Graphical representation to find mode and median

- Measures of Dispersion such as range, mean deviation, Standard Deviation, Variance andcoefficient of variation.

- Comparison of two sets of observations.

- Definition of random experiment, sample space, event, Occurrence of event and types of events (impossible, mutually exclusive, exhaustive, equally likely).

- Definition of Probability, addition and multiplication theorems of Probability

UNIT-V

APPLICATION OF DERIVATIVES

- Geometrical meaning of Derivative, Equation of tangent and Normal

- Rates and Motion

- Maxima and minima

- Radius of Curvature

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References:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40thEdition, 2007.

2. G. B. Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9thEdition, 1995.

3. Reena Garg, Engineering Mathematics, Khanna Publishing House, New Delhi (RevisedEd. 2018)

4. S.P. Deshpande Mathematics for Polytechnic Pune Vidyarthi Griha Prakashan, Pune.

o **Learning Outcomes**

o Be able to draw and interpret Venn diagrams of set relations and operations and use Venn diagrams to solve problems.

o Recognize when set theory is applicable to real-life situations, solve real-life problems, and communicate real-life problems and solutions to others.

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Semester-II

(Common to all Branches)

Course Code	DE202
Course Title	Applied Physics-II
Credits	3(L: 3 T: 0 P: 0)

Course Objectives:

Applied physics aims to gives an understanding of this world both by observation and prediction of the way in which the object behaves; This course helps the student to solve board-based engineering problems.

Unit – 1

Wave motion and its applications:

Wave motion, transverse and longitudinal waves with examples, definitions of wave velocity, frequency and wave length and their relationship, Sound and light waves and their properties, Wave equation, Amplitude, Phase, Phase difference, principle of superposition of waves and beat for mation. Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc. Simple harmonic progressive wave and energy transfer, study of vibration of cantilever and determination of its time period, Free, forced and resonant vibrations with examples. Acoustics of buildings – reverberation, reverberation time, echo, noise, coefficient of absorption of sound, methods to control reverberation time and their applications, Ultrasonic waves – Introduction andproperties, engineering and medical applications of ultrasonic.

Unit – 2

Optics: Basic optical laws; reflection and refraction, refractive index, Images and image formation by mirrors, lens and thin lenses, lens formula, power of lens, magnification and defects. Total internal reflection, Critical angle and conditions for total internal reflection, applications of total internal reflection in optical fiber. Optical Instruments; simple and compound microscope, astronomical telescope in normal adjustment, magnifying power, resolving power, uses of microscope and telescope, optical projection systems.

Unit – 3

Electrostatics: Coulombs law, unit of charge, Electric field, Electric lines of force and their properties, Electric flux, Electric potential and potential difference, Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor, plane charged sheet and charged sphere. Capacitor and its working, Types of capacitors, Capacitance and its units. Capacitance of a parallel plate capacitor, Series and parallel combination of capacitors (related numerical), dielectric and its effect on capacitance, dielectric break down.

Unit – 4

Current Electricity: Electric Current and its units, Direct and alternating current, Resistance and its units, Specific resistance, Conductance, Specific conductance, Series and parallel combination of resistances. Factors affecting resistance of a wire, carbon resistances and colour coding. Ohm's law and its verification, Kirchhoff's laws, Wheatstone bridge and its applications (slide wire bridge only), Concept of terminal potential difference and Electro motive force (EMF) Heating effect of current, Electric power, Electric energy and its units (related numerical problems), Advantages of Electric Energy over other forms of energy.

Unit – 5

Electromagnetism: Types of magnetic materials; dia, para and ferromagnetic with their properties, Magnetic field and its units, magnetic intensity, magnetic lines of force, magnetic flux and units, magnetization. Concept of electromagnetic induction, Faraday's Laws, Lorentz force (force on moving charge in magnetic field). Force on current carrying conductor, force on rectangular coil placed in magnetic field. Moving coil galvanometer; principle, construction and working, Conversion of a galvanometer into ammeter and voltmeter.

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Semiconductor Physics: Energy bands in solids, Types of materials (insulator, semi- conductor, conductor), intrinsic and extrinsic semiconductors, p-n junction, junction diode and V-I characteristics, types of junction diodes. Diode as rectifier – half wave and full wave rectifier (centre taped). Transistor; description and three terminals, Types- pnp and npn, some electronic applications (list only). Photocells, Solar cells; working principle and engineering applications.

Text Books:

Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi

Reference Books:

Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi

Course Outcomes:

After undergoing through syllabus, the students will be able to

1) Explain the wave motion, simple harmonic motion, polarization of wave etc.
2) Explain the ultrasonic waves and engineering, medical and industrial application of ultrasound.
3) Apply the knowledge of diodes, led, power adapters in electronic circuit.
4) Explain the current as flow of charge, concept power and resistance. Etc.
5) Express the nano science and technique and their effects on nanosecond and science and their impact on society. Etc.

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Semester-II

(Common to all Branches)

Course Code	DE203
Course Title	Fundamental of Electrical & Electronics Engineering
Credits	3(L: 3 T: 0 P: 0)

Course Objectives:

1. To familiarize students with basic electrical and electronic components andtheir functions
2. To make the students aware with AC and DC circuits and their analysis.

Unit-I

Overview of Electronic Components & Signals: Passive Active Components: Resistances, Capacitors, Inductors, Signals: DC/AC, voltage/current, periodic/non-periodic signals, average, rms, peak values, different types of signal waveforms, Ideal/non-ideal voltage/current sources, independent/dependent voltage current sources.

Unit- II

Diodes, Transistors, FET, MOS and CMOS and their Applications, Overview of Digital Electronics: Introduction to Boolean Algebra, Electronic Implementation of Boolean Operations, OP AMP 741

Unit- III

Electric and Magnetic Circuits: EMF, Current, Potential Difference, Power and Energy; M.M.F, magnetic force, permeability, hysteresis loop, reluctance, leakage factor and BH curve; Electromagnetic induction, Faraday's laws of electromagnetic induction, Lenz's law

Unit-IV

A.C. Circuits: Cycle, Frequency, Periodic time, Amplitude, Angular velocity, RMS value, Average value, Form Factor Peak Factor, impedance, phase angle, and power factor; Mathematical and phasor representation of alternating emf and current; Voltage and Current relationship in Star and Delta connections; A.C in resistors, inductors and capacitors; A.C in R-L series, R-C series, R-L-C series and parallel circuits; Power in A. C. Circuits, power triangle, Introduction Overview and applications of

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Electrical Machines DC Motor, DC Generator, AC Generator, Induction Motor and Transformer.

Text Books:

1. Basic Electrical Engineering I.J. Nagrath and D.P. Kothari, 2nd Edition, TMH, Delhi.

2. Basic Electrical Engineering by UA Bakshi and AV Bakshi Technical Publications Pune.

Reference Books:

1. Ritu Sahdev, Basic Electrical Engineering, Khanna Publishing House

2. Mittle and Mittal, Basic Electrical Engineering, McGraw Education, New Delhi, 2015, ISBN:978-0-07-0088572-5

3. Saxena, S. B. Lal, Fundamentals of Electrical Engineering, Cambridge University Press, latest edition ISBN: 9781107464353

Course Outcomes:

After completing the course students will be able to

1. Discuss about basic electrical and electronic devices

2. Solve network problems of AC and DC circuits

3. Can design basic analog and digital circuits.

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Semester-II

(Common to all Branches)

Course Code	DE253
Course Title	Fundamental of Electrical & Electronics Engineering Lab
Credits	1(L: 0 T: 0 P: 2)

Course Objectives:

1. To make the students able to do design and make connection for basic electrical circuit.
2. To enable students to verify the characteristics of the electrical and electronic circuits practically
3. To have sound practice of electrical safety.

List of Experiments

1. To study the various components of Electrical and Electronics.
2. To determine the stated value of a resistor by interpreting the color code indicated on the resistor.
3. To measure resistance using ohmmeter
4. To study and verify the series and parallel Circuit.
5. To study and plot V-I Characteristics of Silicon P-N Junction Diode.
6. To study the dependence of current on the potential difference across a resistor and determine its resistance. Also plot a graph between V and I.
7. To study the Inverting Amplifier and Non-Inverting Amplifier op-amp circuits.
8. To study the basic logic gates: AND, OR, NOT
9. To Study the Characteristics of Half – Wave Rectifier.
10. To study the Characteristics of Light Emitting Diode

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Course Outcomes:

1. Students will be able to analyze and design electrical and electronic circuits practically.

2. Students will be able to study the characteristics of basic electrical circuits.

3. Students will be able to follow electrical safety in all prospects.

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Semester-II

(Common to all Branches)

Course Code	DE204
Course Title	Engineering Mechanics
Credits	3(L: 3 T: 0 P: 0)

Unit -I

Basics of mechanics and force system: Significance and relevance of Mechanics, Applied mechanics, Statics, Dynamics. Space, time, mass, particle, flexible body and rigid body. Scalar and vector quantity, Units of measurement (SI units) - Fundamental units and derived units. Force –unit, representation as a vector and by Bow's notation, characteristics and effects of a force, Principle of transmissibility of force, Force system and its classification. Resolution of a force - Orthogonal components of a force, moment of a force, Varignon's Theorem. Composition of forces – Resultant, analytical method for determination of resultant for concurrent, non-concurrent and parallel co-planar force systems – Law of triangle, parallelogram and polygon of forces.

Unit– II

Equilibrium: Equilibrium and Equilibrant, Free body and Free body diagram, Analytical and graphical methods of analyzing equilibrium Lami's Theorem – statement and explanation, Application for various engineering problems. Types of beams, supports (simple, hinged, roller and fixed) and loads acting on beam (vertical and inclined point load, uniformly distributed load, couple), Beam reaction for cantilever, simply supported beam with or without overhang – subjected to combination of Point load and uniformly distributed load. Beam reaction graphically for simply supported beam subjected to vertical point loads only.

Unit– III

Friction: Friction and its relevance in engineering, types and laws of friction, limiting equilibrium, limiting friction, co-efficient of friction, angle of friction, angle of repose, relation between co-efficient of friction and angle of friction. Equilibrium of bodies on level surface subjected to force parallel and

inclined to plane. Equilibrium of bodies on inclined plane subjected to force parallel to the plane only.

Unit– IV

Centroid and center of gravity: Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle) Centroid of composite figures composed of not more than three geometrical figures Centre of Gravity of simple solids (Cube, cuboid, cone, cylinder, sphere, hemisphere) Centre of Gravity of composite solids composed of not more than two simple solids.

Unit – V

Simple lifting machine: Simple lifting machine, load, effort, mechanical advantage, applications and advantages. Velocity ratio, efficiency of machines, law of machine. Ideal machine, friction in machine, maximum Mechanical advantage and efficiency, reversible and non- reversible machines, conditions for reversibility Velocity ratios of Simple axle and wheel, Differential axle and wheel, Worm and worm wheel, Single purchase and double purchase crab winch, Simple screw jack, Weston's differential pulleyblock, geared pulley block.

Reference Books:

1. D.S. Bedi, Engineering Mechanics, Khanna Publications, New Delhi(2008)
2. Khurmi, R.S., Applied Mechanics, S. Chand & Co. New Delhi.
3. Bansal R K, A text book of Engineering Mechanics, Laxmi Publications.
4. Ramamrutham, Engineering Mechanics, S. Chand & Co. New Delhi.

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Semester-II(Common to all Branches)

Course Code	DE205
Course Title	Communication Skills-2
Credits	3(L: 3T: 0 P: 0)

UNIT -1

Formal written skills Office Drafting: Circular, Notice and Memo Job Application with resume.

Business correspondence: Enquiry, Order letter, Complaint letter and Adjustment letter.

Report writing: Accident report, fall in production, Progress report, Investigation report.

UNIT -2

Principles of Effective Communication Principles of Effective listening/Speaking Communication

Barriers, Overcoming Barrier

UNIT -3

Soft skill development

Speaking skill

Introduction to Group discussion Process of Group Discussion Leadership skillInstant public speaking

UNIT -4

Etiquettes and Body Language Telephone etiquettes listening/Speaking Problems of telephonic

conversation Verbal /oral etiquettes

Physical appearance

Eye contact/ Body Language Group Discussion

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Suggested Books:

o Contemporary English Grammar Structures and Composition; DavidGreen, Macmillan

o English Grammar and composition; R. C. Jain, Macmillan

o Effective Technical Communication; M. Ashraf Rizvi, Tata McGraw HillCompanies

o Developing Communication Skills; Krushna Mohan, Meera Baneji,Macmillan

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Semester-III

Course Code	DE301
Course Title	**Mathematics-III**
Credits	3(L: 3T: 0 P: 0)

Unit -I

Integration: Rules of integration (Integrals ofsum, difference,scalar multiplication). Methods of Integration. Integration by substitution Integration of rationalfunctions. Integration by partial fractions. Integration by trigonometric transformation. Integration by parts. Definite Integration. Definition of definite integral. Propertiesofdefinite integralwithsimpleproblems. Application of integration Area under the curve. Area between two curves. Mean and RMS values.

Unit - II

Differential Equation Definition of differential equation, order and degree of differential equation. Formation of differential equation for function containing single constant. Solution of differential equations offirst order and first degree such as variable separable type, reducible to Variable separable, Homogeneous, Non-homogeneous, Exact, Linear and Bernoulli equations. Applications of Differential equations.

Unit III

Laplace Transform Definition of Laplace transform, Laplace transform of standard functions. Properties of Laplace transform such as Linearity, first shifting, second shifting, multiplication by tn, division by t.

Unit- IV

Fourier Series Definition of Fourier series (Euler'sformula). Series expansion of continuousfunctions in the intervals Series expansions of even and odd functions. Half range series.

Unit V

Numerical Methods Solution of algebraic equation Bisection method. Regular falsi method. Newton - Raphson method. Solution ofsimultaneous equations containing 2 and 3 unknowns Gauss elimination method.

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Reference books:

1. Mathematics for polytechnic, S. P. Deshpande , Pune Vidyarthi Griha Prakashan, Pune.

2. Calculus: single variable, Robert T. Smith, Tata McGraw Hill.

3. Higher Engineering Mathematics, B. S Grewal, Khanna Publication, New Delhi

Semester-III

Course Code	DCSE302
Course Title	Data Structure

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Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- To develop skills to apply appropriate data structures in problem solving.
- To provide the knowledge of basic data structures and their implementations.
- To understand importance of data structures in context of writing efficient programs.

Unit I:

Basics of C:C character set, tokens, constants, variables, keywords. Operators (arithmetic, Logical, assignment, relational, increment and decrement, conditional, special, operatorprecedence), data types, Formatted input, formatted output. If statement (if, if-else, else-if ladder, nested if-else), Switch case statement, looping: for, while, do-while statements. Introduction toArrays, Declaration, initialization and working of one &two dimensional arrays. Functions: defining functions, function call (call by value, call by reference).

Unit II:

Introduction to datastructure: Data Representation: Abstract data Types, Data Structures (Linear and NonLinear), Atomic Type. Data Types: Primitive data type, Derived data type, Operationson data structures, Traversing,Inserting,Deleting, Searching and sorting. Principles of programming and Analysis of Algorithms: Algorithms, Different approaches for designing an algorithm, Complexity in terms of time and space, Big O 'Notation. Searching &Sorting: Sorting, An Introduction, Sorting Techniques: Bubble Sort, Selection Sort, and InsertionSort.Searching: An Introduction, Linear search, Binary Search.

Unit III:

Stacks: Introduction to Stacks: Stacks as an Abstract Data Type, Primitive operations of stacks. Representation of Stacks through Arrays, Application of Stacks, Arithmeticexpression: Polish Notation Queues: Introduction, Queue as an Abstract Data Type, Representation of Queues, Operations on queue: Searching, Insertion, Deletion. Types of queues:Circular Queues, Priority Queue, De-queues, Application of Queues Linked List: Introduction: Terminologies Node, Address,

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Pointer, Information, Next, Null pointer, Empty list etc. Operations on list Searching, Insertion and Deletion. Types of lists: Linear list, Circular list, doublylist,Array, stacks, queues, implementation using list

Unit IV:

Trees: Introduction to Trees, Types of Trees, General tree, Binary tree, Binary search tree, Traversal—In order, Preorder and Post order, searching--Depth-first search and Breadth-first search Graphs: Introduction, Terminology graph, node (vertices), arcs(edge), directed graph, indegree, outdegree, adjacent, successor, predecessor, relation, weight, path, length, Sequential Representation of Graphs, Linked Representation of Graphs.

Learning Outcomes:

- Able to identify the appropriate data structures and algorithms for solving real world problems.
- Able to implement various kinds of searching and sorting techniques.
- Able to implement data structures such as stacks, queues, Search trees, and hash tables to solve various computing problems.

Suggested Readings:

1.   E. Balagurusamy – Programming in ANSI C, 3rd Edn. , TMH, New Delhi ; 2004

2.   Y. Kanetkar – Let us C, 4th Edition, BPB Publication , New Delhi; 2002

3.   E. Horowitz and S. Sahani, "Fundamentals of Data Structures", Galgotia Booksource Pvt. Ltd, 2003

4.   R. S. Salaria, "Data Structure & Algorithms", Khanna Book Publishing Co. (P) Ltd., 2002.

5.   P. S. Deshpande and O.G. Kakde, "C & Data Structure", Wiley Dreamtech, 1st Edition, 2003.

Semester-III

Course Code	DCSE303
Course Title	Programming in C
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

o Programming basics and the fundamentals of C

o Mathematical and logical operations

o Loops and conditional statements

o Implementing pointers

o File management and dynamic memory allocation

Unit- I

Program Logic development Using algorithm and Flowchart, Historical development of_C, Constants, variables and keywords,_C instructions. Data types – int, float, double, char, void, short, long double ,signed, unsigned

Unit–II

Decision control structure: - if statement, if-else statement, the conditional operators .Case control structure: switch statement ,goto statement .C' operators :Arithmetic ,relational and logical .Development of C 'program using Decision control & Case control structure.

Unit-III

Operators:-Increment and Decrement operators, Bit wise operator, Operators precedence, arithmetic and logical expressions evolution. Loop Control Structure:-for loop, while loop and do while loop, Break statement, continue statement. Development of_C' programs using loops.

Unit- IV

Arrays: One dimension array, 2D array, 3D array, Introduction to Pointers. Functions: Function Declaration and prototypes, Passing values between functions:- call by value. Development of_ C programs using Arrays, functions.

Unit-V

Storage classes in_C', Structures:-declaring a structure, accessing structure element, how structure elements are stored, array of structures, union.

TEXT BOOKS:

1. V.Rajaraman"Computer Programming inC"PHI,NewDelhi,2001

2. Kamthane, A.N.,"Programming with ANSI and Turbo C", Pearson Education,Delhi,2006.

3. Yashavan P. Kanetkar "Pointers In C", BPB Publications, New Delhi, 2002

4. E. Balagurusamy "Programming in ANSI C",TataMcGrawHill,2004

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5. Deite and Deitel"CHowtoProgram",AddissonWesley,2001

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-III

Course Code	DCSE304
Course Title	Data Communication
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

To understand the basic concepts of data communication, layered model, protocols and inter-working between computer networks and switching components in telecommunication systems**.**

Unit 1: Introduction: A communication model, data communications, data communications networking protocols and protocols architecture. (04 Lectures)

Unit 2: Data transmission and transmission Media: Concepts and terminology, analog and digital data transmission, transmission impairments guided transmission media, wireless transmission. (06 Lectures)

Unit 3: Data Encoding and Communication Interface: Digital data- digital signals. Digital data- analog signals, analog data- digital signals. analog data- analog signals, Spread spectrum, asynchronous and synchronous transmission line configurations, interfacing. (06 Lectures)

Unit 4: Data Link Control and Multiplexing: Flow control, error detection, error control, high level data link control, other data link control protocols frequency division multiplexing, synchronous time division multiplexing, statistical time-division multiplexing, statistical time- division multiplexing. (08 Lectures)

Unit 5: Protocols and Architecture: Protocols, OSI, TCP/IP protocol suite. (06 Lectures):

Unit 6: Switching: Circuit-switched networks, Virtual-circuit networks, Datagram networks, Structure of a switch. (06 Lectures)

Unit 7: Network Management: Network Management System, Simple network management protocol (SNMP), Network security. (04 Lectures)

Expected Learning Outcomes:

- Recognize the networking models used for seamless communication among computer user.

- Find out how layered model communication functions can be organized and be very successful in communication.

- Differentiate between OSI and TCP/IP models.

Text Book:

1. B.A. Forouzan, "Data Communication and Networking". 4e, TMH

Reference Books:

1.   Stallings. W., "Data and Computer Communication", 6e, PHI.

2.   Andrew S. Tanenbaum, "Computer Networks", 4e, PHI

Semester-III

Course Code	DCSE304
Course Title	Operating System

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Credits	3(L: 3T: 0 P: 0)

Course Objectives:

The purpose of this course is to understand the mechanisms of the Operating Systems like Process Management, Process Synchronization, Memory Management, File System Implementation, Storage Structures used in OS and Protection Principles.

Unit- 01

INTRODUCTION: Evaluation of Operating Systems, Types of Operating Systems, Different views of the Operating Systems,

Unit- 02

PROCESSES: The Process Concept, Systems Programmer's view of Processes, The Operating System view of Processes, Operating System Services for Process Management, Scheduling algorithms, Performance Evaluation.

Unit- 03

INTERPROCESS COMMUNICATION AND SYNCHRONIZATION: The need for inter

process synchronization, mutual exclusion, semaphores, Hardware support for mutual exclusion, Classical Problems in concurrent programming, Critical region and conditional critical region, monitors, messages, deadlocks.

Unit- 04

MEMORY MANAGEMENT: 04.01 Contiguous Allocation Single Process Monitor, Partitioned memory allocation static, Partitioned memory allocation-Dynamic, segmentation 04.02 Noncontiguous Allocation Paging, Virtual Memory(allocation policies and replacement policies.

Unit- 05

FILE MANAGEMENT: A generalization of file services. Directory structure, command Language uses view of the file System.

Unit- 06

SECURITY AND PROTECTION: Security threats and goals, penetration, attempts, security policies and mechanisms, authentication, protection and access control, worms and viruses.

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Unit- 07

MULTI PROCESSOR SYSTEMS: Motivation and classification, multi processor interconnection, types of multi processor operating system, multi processor OS functions and requirements, introduction of parallel computing (distributed operating system) Introduction to multiprocessor synchronization.

Unit- 8

CASE STUDY:

LINUX OPERATING SYSTEM Introduction to Linux Operating System. Linux features & Benefits :- Introduction to Linux:- Systems characteristics and requirements with Linux. Getting Started:- System manger, Password, Log in, Log out, running the system.

UNIX OPERATING SYSTEM Introduction to Unix Operating System. Unix features & Benefits :- Introduction to Linux:- Systems characteristics and requirements with Linux. Getting Started:- System manger, Password, Log in, Log out, running the system. File in the Unix System:- File structure in Unix, Working with file structures, removable file volumes. Unix Command Shells:- Issuing commands, Input handling by the shells, The shell programming language, Running the Unix shells, Pipes, Version of Unix Systems. The System Kernel:- Nature of the Kernel, Process Co-ordinations and Management, Input and Output Operations.

Course Outcomes:

- know basic components of an operating system.
- comprehend how an operating system virtualises CPU and memory.
- discuss various scheduling and swapping policies.
- learn basic concurrent programming in C and assembly code.
- explain how a simple file system organizes data in the hard disk

Books Recommended:

1. Operating Systems-Concept and Design, McGraw-Hill international Edition-ComputerScience 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 Silberschatz

4. Modern Operating Systems, Prentice-Hall of India Private Ltd., 1995. - Andrew S.Tanenbaum

5. Microsoft Windows Manual –

6. First Course in Computers, Vikash Publishing House Pvt. Ltd., Jungpura, New Delhi. - Sanjay Saxena

7. WWW.msn.com and linked sites -

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-III

Course Code	DCSE352
Course Title	Data Structure Lab
Credits	1(L: 0T: 0 P: 2)

SYLLABUS

1. Program to Find the Number of Elements in an Array

2. Develop and Implement a menu driven program in C for the following Arrayoperations

a. Creating Array of N Integer elements.

b. Display of Array elements with suitable headings.

c. Inserting an element (ELEM) at a given valid position (POS).

d. Deleting an element at a given valid position (POS).

e. Exit

3. Programs for Stack, Queues and Circular Queues using Arrays

4. Program to convert an Infix Expression into Postfix and Postfix Evaluation

5. Program to implement stack using arrays

6. Program to implement stack using linked list

7. Program to implement multiple stack in a single array

8. Program to convert infix notation to postfix notation using stacks

9. Program to implement queue using arrays

10. Program to implement queue using pointers

11. Program to reverse elements in a queue

12. Program to implement circular queue using arrays

13. Program to create add remove & display element from single linked list

14. Program to create add remove & display element from double linked list

15. Program to count number of nodes in linear linked list

16. Program to create add remove & display element from circular linked list

17. Programs to implement stack & queues using linked representation

18. Program to concatenate two linear linked lists

19. Program to accept a singly linked list of integers & sort the list in ascending order.

20. Program to reverse linked list

21. Program to represent polynomial using linked list

22. Program to add two polynomials using linked list

23. Program for the creation of binary tree, provide insertion & deletion in c

24. Program for pre-order, post-order & in-order traversals of a binary tree using nonrecursive.

25. Program to count no, of leaves of binary tree

26. Program for implementation of B-tree (insertion & deletion)

27. Program for implementation of multi-way tree in c

28. Program for implementation of AVL tree

29. Program to implement bubble sort program using arrays

30. Program to implement merge sort using arrays

31. Program to implement selection sort program using arrays

32. Program to implement insertion sort program using arrays

33. Program to implement topological sort using arrays

34. Program to implement heap sort using arrays

35. Program to implement heap sort using pointers

36. Program to implement bubble sort program using pointers

37. Program to implement linear search using pointers

38. Program to implement binary search using pointers

39. Program to implement linear search using arrays

40. Program to implement binary search using arrays

Text Books:

1. Baluja G S, "Data Structure through C", Ganpat Rai Publication, New Delhi, 2015.

2. Pai G A V, "Data Structures and Algorithms: Concepts, Techniques and Applications", 2nd Edn, Tata McGraw-Hill, 2008.

3. Horowitz E., Sahni S., Susan A., "Fundamentals of Data Structures in C", 2nd Edition, University Press, 2010.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Reference Books:

1. Tremblay J. P.**,** Sorenson P. G, "An Introduction to Data Structures with Applications", 2nd Edn, McGraw-Hill, Inc. New York, NY, USA.

2. Lipschutz Seymour, "Data Structures", 6th Edn, 9th Reprint 2008, Tata McGraw-Hill.

3. Drozdek Adam, "Data Structures and Algorithms in C++", Thomson Learning, New Delhi – 2007.

4. Feller J., Fitzgerald B., "Understanding Open Source Software Development", Pearson Education Ltd. New Delhi

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-III

Course Code	DCSE353
Course Title	Programming in C Lab
Credits	1(L: 0T: 0 P: 2)

SYLLABUS

List of Programs as Assignments:

1. Write an interactive program that will read in a +ve integer value and determine the following

i) If the integer is a prime number   ii) If the integer is a Fibonacci number

2. WAP in C to compute $sinx = x - x^3/3! + x^5/3! - x^7/7!$ ….. Continue adding successive terms in the series until the value of the next term becomes smaller (in magnitude) than 10^{-5}. Test the program for $x = 1$, $x = 2$, and $x = 3$. In each case display the number of terms used to obtain the final answer.

3. WAP to generate every 3rd integer beginning with $I = 2$ and continue for all integers that are less than 150. Calculate the sum of those integers that are evenly divisible by 5.

4. WAP to find whether a given year is a leap year or not. Modify it to generate a list of leap years between two year limits given by user.

5. WAP to display the following pattern:

11

11   10   11

11   10   9   10   11

11   10   9   8   9   10   11

6. Using Ternary / Conditional operator find the greatest among 3 numbers.

7. WAP to convert a decimal number into an equivalent number of the input base. Test your program for base 2,8,10 & 16.

8. WAP to read a number n, and print it out digit-by-digit, as a series of words. For e.g. 123 would be printed as "one two three".

9. WAP to check whether any input +ve integer is palindrome or not.

10. WAP to simulate a simple calculator (+ - / * %) that takes two operands and an operator as input and displays the result.

11. WAP to find the GCD of two input +ve integer numbers.

12. WAP to swap the values of two variables without using a third variable.

13. Read a line of mixed text, and then write it out with all lower case and uppercase letters reversed, all digits replaced by 0s and all other characters (non-letters and non- digits) replaced by '*'.

14. WAP to find the product of two matrices A and B. Display the source matrices and product matrix C in matrix format.

15. WAP to find whether a given matrix is a triangular matrix or not.

16. WAP to find the transpose of a matrix. Display the source and the transposed matrix in matrix format.

17. Implement Prob. No. – 14 to 16 using functions for reading, manipulating and displaying the corresponding matrices in matrix form.

18. WAP to sort a list of strings alphabetically using a 2-dim. Character array.

19. WAP to display the row sum and the column – sum of an input 2- dim. Matrix. Display the source matrix with row and column sum.

20. Write a recursive function to calculate $S = 2 + 4 + 6 + 8 + \ldots + 2N$. Implement the function in a complete C program.

21. Write a function that accepts two arguments an array and its size n. It performs Bubble up sort on the array elements. Using indirection operator '*' implement this in a complete C program. Display the source and the sorted array.

22. Using pointer, write a function that receives a character string and a character as argument. Delete all occurrences of this character in the string. The function should return corrected string with no holes.

23. Write a function for reading character string using pointer. Calculate the length of the string (without using strlen ()). Finally print the string in reverse order, using pointer.

24. Implement prob. No. 14 using pointers representation of 2 – dim. array.

25. Implement prob. No. 15 using pointer representation of 2 dim. array.

26. Implement prob. No. 16 using pointer representation of 2 dim. array.

27. WAP to sort a list of strings into alphabetical order using array of pointers.

28. Create records of 60 students, where each record has fields-name, roll,

gpa and fees. Write a function update () to reduce the fees of those students who have obtained gpa greater than 8.5 by 25% of the original fees. Write a complete program to exercise this function in the main program and display all the records before and after updation.

29. Define a structure that describes a hotel. It should have members that include the name, address, grade, average room charge and number of rooms. Write a function to perform the following operations:

a) To print out hotels of a given grade in order of charges.

b) To print out hotels with room charges less than a given value.

30. WAP to concatenate the contents of two files into a third file.

31. WAP to copy the content of one file into another file. Names of both the files are to be input as command line arguments

Text Books:

1. Jery R Hanly, "Problem solving and Program design in C", PaersonEducation, 7th Edition. **(T1)**

2. Byron Gottfried, "Schaum's Outline of Programming with C", McGraw-Hill. **(T2)**

3. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill. **(T3)**

4. R.G.Dromey, How to Solve it by Computer, Pearson Education. **(T4)**

Reference Books:

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1. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", Prentice Hall India Learning Private Limited.**(R1)**

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-III

Course Code	DCSE354
Course Title	Operating System Lab
Credits	1(L: 0T: 0 P: 2)

List of Experiments:

1.   Write a program to implement FCFS CPU scheduling algorithm.

2.   Write a program to implement SJF CPU scheduling algorithm.

3.   Write a program to implement Priority CPU Scheduling algorithm.

4.   Write a program to implement Round Robin CPU scheduling algorithm.

5.   Write a program to compare various CPU Scheduling Algorithms over different Scheduling Criteria.

6.   Write a program to implement classical inter process communication problem.

7.   Write a program to implement classical inter process communication problem.

8.   Write a program to implement classical inter process communication problem.

9.   Write a program to implement & Compare various page replacement algorithm.

10. Write a program to implement & Compare various Disk & Drum scheduling Algorithms.

11. Write a program to implement Banker's algorithms.

12. Write a program to implement Remote Proccedure Call(RPC).

13. Write a Devices Drivers for any Device or pheriperal.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-III

Course Code	SIP
Course Title	Summer Internship I
Credits	1(L: 0T: 0 P: 2)

Note:- A student can be allowed to do the internship outside after the permission of Departmental Academic Committee.

- Those who are doing internship outside but within the same city has to present their internship progress every month.
- Those who are doing internship outside the city can be permitted to present their internship progress every fortnight through video conferencing.
- Those who are doing internship at home, has to present their internship progress every week.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER –IV

Course Code	DCSE401
Course Title	Object Oriented Programming With C++
Credits	3(L: 3T: 0 P: 0)

Unit 1

Principles of OOP, procedure oriented programming vs. object oriented programming, basic concepts, advantages, application of OOPs, object oriented languages. Beginning with C++: Concepts & structure of C++ programming, concepts of structure. Objects & classes: Specifying a class, Defining member functions, Access specifies (public, private) Arrays within a class, Creating objects, memory allocation for objects, static data & member function, Arrays of objects, objects as function argument.

Unit 2

Constructors and Destructors. Concept of Constructor, Types of constructors (Default, Parameterized, copy,), Overloaded Constructors (Multiple Constructor), Constructor with defaultargument, Destructors. Function overloading, Operator overloading (overloading unary & binary operators), rules for overloading operators.

Unit 3

Inheritance: Concepts of inheritance, Derived classes, Member declaration (Protected), Types of inheritance (Single, multilevel, multiple, hierarchical, Hybrid inheritance). Polymorphism: Concepts of polymorphism, types of polymorphism, function Overloading &function overriding, Virtual function, Static & dynamic binding.

Unit 4

Pointers in C++ : Concepts of pointer (Pointer declaration, pointer operator, address operator, pointer expressions, and pointer arithmetic), Pointers & functions (Call by value, call by reference, pointer to functions, passing function to another function), Pointers in arrays

(Searching, insertion & deletion), Pointers & objects(Pointers to objects, this pointer, and pointer to derived classes).

Suggested Readings:

1 Object Oriented Programming in C++ by E. Balagruswamy

2. Object Oriented Programming in C++ Saurav Sahay Oxford University Press.

3. Object Oriented Programming in C++ R Rajaram New Age International Publishers 2nd Editon.

Object Oriented Programming in C++ by Robert Lafore Tech media Publication

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-IV

Course Code	DCSE402
Course Title	**Computer Architecture**
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- Understand units of measure common to computer systems .

- Appreciate the evolution of computers. Understand the computer as a layered system.

- Be able to explain the von Neumann architecture and the function of basic computer components.

Unit- 1

Numbering System: Decimal, Binary, BCD, Octal, Hexadecimal, Gray Code. X53 Code, ASCII code, EBCDIC Code.

Unit- 2

Logic Gates: Inverter, AND, OR, NAND, NOR, XOR, XNOR.

Unit- 3

Boolean Algebra: Boolean Postulates, Boolean Laws, Application of De Morgan's Theorem, Simplification of Boolean Algebraic expressions, Logic circuits, Translating Algebra to Logic and Logic Circuit to Algebraic, Truth table from logic circuit, Logic circuit from truth table, Combinational circuit using NAND/NOR converting AND/OR NAND/NOR convertingAND/OR to NAND/NOR logic.

Unit- 4

Karnaugh Map Technique: Introduction, K-maps, SOP & POS reduction, Don't care states Combinational logic circuits design.

Unit- 5

Arithmetic Logic Circuits: Introduction, Signed & Unsigned binary numbers, 1's & 2's complement representation and the arithmetic, Arithmetic circuits, Half/Full adder, Binary Subtraction, Half/Full Subtractor.

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Unit- 6

Combinational Logic Circuits: Introduction, decoder, encoder, multiplexer, demultiplexer.

Unit- 7

Flip-Flops: Introduction, RS NAND/NOR Latch, clocked RS Latch, D Latch, JK Master slaveF/F, JK edge triggered F/F, converting JK F/F to other types.

Text Books:

M.Morris Mano, "Digital Logic & Computer Design", PHI Reference Book: Virendra Kumar, "Digital Technology", New Age International

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-IV

Course Code	DCSE403
Course Title	Database Management System
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

Master the basics of SQL and construct queries using SQL.

Understand the relational database design principles.

Familiar with the basic issues of transaction processing and concurrency control.

Familiar with database storage structures and access techniques.

UNIT- 01

INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS (DBMS)

Why Database, Characteristics of Data in Database, DBMS, What is database Advantage ofDBMS

UNIT- 02

DATABASE ARCHITECTURE AND MODELLING

Conceptual, physical and logical database models, Role of DBA, Database Design

UNIT- 03

ENTITY RELATIONSHIP MODEL

Components of ER Model, ER Modeling Symbols, Super Class and Sub Class types UNIT- 04 –
RELATIONAL DBMS: [06] Introduction to Relational DBMS

UNIT- 05

RELATIONAL ALGEBRA AND RELATIONAL CALCULUS

Relational Algebraic operations, Tuple Relational Calculus

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

UNIT- 06

INTRODUCTION TO SQL

History of SQL, Characteristics of SQL Advantages of SQL, and SQL in Action SQL data types and Literals, Types of SQL commands, SQL Operators and their precedence, Queries and Sub queries Aggregate functions, Insert, Update and Delete operations. Joins, Unions

UNIT- 07

DATABASE NORMALISATION Keys, Relationships, First Normal Form, Functional dependencies, Second Normal Form, Third Normal Form,

UNIT- 08

BACK UP AND RECOVERY Database backups; why plan backups? Hardware protection and redundancy, Transaction logs. Importance of backups, Database recovery 7

UNIT- 09

DATABASE SECURITY AND INTEGRITY

Types of Integrity constraints, Restrictions on Integrity constraints, Data security risks, Data security requirements, Database users, Protecting data within the database, Granting and revoking privileges and roles. Concepts of DBMS will be implemented by using the popular relational DBMS package such as ORACLE/ MS-SQL.

Course outcomes:

o Understand the basic principles of database management systems.

o Draw Entity-Relationship diagrams to represent simple database .

Text Books

1. Database Management Systems, First Edition, 2002, Vikas Publishing House - A. Leon & M.Leon

2. Fundamentals of Database Systems, Third Edition, 2000, Addison Wesley - R. Elmasri, S.Navathe

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Reference Books:

1. Database System Concepts, Third Edition, 1997, McGraw-Hill Internation - H. Korth, A. Silberschatz

2. An Introduction to Database Systems, Galgotia Publication - B. Desai

3. Database Processing: Fundamentals, Design Implementation, Prentice Hall of India. - D.K. Kroenke

4. Database Management Systems, First Edition, 1996, McGraw Hill - P. Bhattacharya and A.K. Majumdar

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-IV

Course Code	DCSE404
Course Title	Software Engineering
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- Knowledge of basic SW engineering methods and practices, and their appropriate application.
- Describe software engineering layered.

Unit- 1

Introduction: Software development projects; Emergence of software engineering, Modern software development practices. Software life cycle models ─ classical waterfall model, prototyping model and evolutionary model.

Unit- 2

Software Project Management: Major responsibilities; Important project parameters; Project scheduling; Risk management.

Unit- 3

Requirements Analysis: Requirement gathering and analysis; Software requirement specification; Formal system specification

Unit- 4

Software Design: Characteristics of software design; Cohesion and coupling; Layered arrangement of Unit-s; Function-oriented and object-oriented design approach.

Unit- 5

User Interface Design: Characteristics of good user interface; Command-based interface and graphical user interface; User interface inspection.

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Unit- 6

Coding and Testing: Coding standard and guidelines; Code review, Software documentation; Testing ─ unit testing, black-box testing and white-box testing; Debugging; Integration testing; System testing.

Unit- 7

Quality Management and Maintenance: Software reliability metrics; Software quality parameters; Basic idea of CASE; Maintenance and its types; Software evolution.

Learning Outcomes:

On completion of the course students will be able to demonstrate:

an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

Textbook:

Rajib Mall, "Fundamentals of Software Engineering", 3e, PHI

Reference Books:

A.Behforooz, F.J. Hudson, "Software Engineering Fundamentals", Oxford University Press

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-IV

Course Code	DCSE405(E)
Course Title	Network Security
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

o   To understand basics of Cryptography and Network Security.

o   To be able to secure a message over insecure channel by various means.

UNIT -I

Introduction and Cryptography-Introduction: Computer security concepts, The OSI security architecture, Security attacks, Security services, Security mechanisms, A model for network security, Standards Cryptography: Symmetric Encryption Principles, Symmetric Block Encryption Algorithms, Random and Pseudorandom Numbers, Stream Ciphers and RC4, Cipher Block Modes of Operation, Approaches to Message Authentication, Secure Hash Function, Message Authentication Codes, Public Key Cryptography Principles, Public-Key Cryptography Algorithms, Digital Signatures.

UNIT -II

Hardware and Software Security-Hardware Security, Smart Cards, Biometrics, Virtual Private Networks, Types of VPN's, Trusted Operating Systems, Pretty Good Privacy (PGP), Security Protocols, Security Socket Layer, Transport Layer Security, IPSec, S/MIME(Secure/Multipurpose Internet Mail Extension)

UNIT -III

Intrusion Detection System and Firewalls - IDS: What is not an IDS?, Infrastructure of IDS, Classification of IDS, Host-based IDS, Network based IDS, Anomaly Vs Signature Detection, Normal Behaviour Patterns-Anomaly Detection, Misbehaviour Signatures-Signature Detection , Parameter Pattern Matching, Manage an IDS. Malicious Software, Safeguards, Firewalls, Packet-Filtering Firewalls, State full Inspection Firewalls, Proxy firewalls, Guard, Personal Firewalls, Limitations of Firewalls.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

UNIT -IV

Wireless Security -Wireless Application Protocol, WAP Security, Authentication, Integrity, Confidentiality, Security Issues with Wireless Transport Layer Security (WTLS), Wireless LAN, WLAN Configuration, WLAN Technology consideration, Wireless LAN Security, Access Point Security, Work Station Security, Safeguarding Wireless LAN's.

UNIT -V

Web Security - Client/Server Architecture, Security considerations and Threats, Web traffic security approaches, SSL/TLS for secure web services, The Twin concept of "SSL Connection" and "SSL Session", SSL session state, SSL Connection State, SSL Record Protocol, SSL Handshake Protocol, Secure Hypertext Transport Protocol(S-HTTP), Secure Electronic Transaction(SET), Business Requirements, SET Participants, SET Transaction Flow.

UNIT -VI

Security and Law, Internet Governance and Email Policy - Security and Law: Regulations in India, Information Technology Act 2000, Cyber Crime and the IT Act 2000, Indian Contract Act,1872, Indian Penal Code, Indian Copyright Act, Consumer Protection Act, 1986, Specific Relief Act, 1963, Government Initiatives, Future Trends-Law of Convergence. Internet Governance and Email Policy: Internet Governance, Network Security Aspects in E-Governance, Security Monitoring Tools, Electronic Mail, What are the e-mail Threats that Organization's face?, Why do you need an E-mail Policy?, How do you create an E-mail Policy?, Publishing the E-mail Policy, University E-mail Policy, Electronic mail policy.

COURSE OUTCOMES:

Students will be able to

o identify and classify particular examples of attacks.

o define the terms vulnerability, threat and attack.

o identify physical points of vulnerability in simple networks.

o compare and contrast symmetric and asymmetric encryption systems and their vulnerability to attack.

o explain the characteristics of hybrid systems.

Text books

1. Network Security Essentials: Applications and Standards, 4/e, William Stallings, Pearson Educaiton, ISBN: 9788131716649 (Chap 1)

2. Network Security and Management, 2nd edition, Brijendra Sing, PHI, ISBN: 9788120339101 (Chap: 2,3,4,5,6)

References

1. Network Security Bible, 2nd edition, Eric Cole, Wiley Publisher, ISBN: 9788126523313

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-IV

Course Code	DCSE406(E)
Course Title	Analog and Digital Communication
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- To develop ability to analyze system requirements of analog and digital communication systems.
- To understand the generation, detection of various analog and digital modulation techniques.
- To acquire theoretical knowledge of each block in AM, FM transmitters and receivers.
- To understand the concepts of baseband transmissions.

UNIT – I

Amplitude Modulation:

Need for modulation, Amplitude Modulation - Time and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves - Switching modulator, Detection of AM Waves - Envelope detector, DSBSC modulation - time and frequency domain description, Generation of DSBSC Waves - Balanced Modulators, Coherent detection of DSB-SC Modulated waves, COSTAS Loop, SSB modulation - time and frequency domain description, frequency discrimination and Phase discrimination methods for generating SSB, Demodulation of SSB Waves, principle of Vestigial side band modulation.

UNIT – II

Angle Modulation: Basic concepts of Phase Modulation, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave using Bessel functions, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave -Generation of FM Signal-Armstrong Method, Detection of FM Signal: Balanced slope detector, Phase locked loop, Comparison of FM and AM., Concept of Pre-emphasis and de-emphasis.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)
UNIT – III

Transmitters: Classification of Transmitters, AM Transmitters, FM Transmitters Receivers: Radio Receiver – Receiver Types – Tuned radio frequency receiver, Superhetrodyne receiver, RF section and Characteristics – Frequency changing and tracking, Intermediate frequency, Image frequency, AGC, Amplitude limiting, FM Receiver, Comparison of AM and FM Receivers.

UNIT – IV

Digital Modulation Techniques: ASK- Modulator, Coherent ASK Detector, FSK- Modulator, NonCoherent FSK Detector, BPSK- Modulator, Coherent BPSK Detection. Principles of QPSK, Differential PSK and QAM. Baseband Transmission and Optimal Reception of Digital Signal: A Baseband Signal Receiver, Probability of Error, Optimum Receiver, Coherent Reception, ISI, Eye Diagrams.

UNIT – V

Digital Modulation Techniques:ASK- Modulator, Coherent ASK Detector, FSK- Modulator, Non-Coherent FSK Detector, BPSK- Modulator, Coherent BPSK Detection. Principles of QPSK, Differential PSK and QAM.

Baseband Transmission and Optimal Reception of Digital Signal:A Baseband Signal Receiver, Probability of Error, Optimum Receiver, Coherent Reception, ISI, Eye Diagrams.

TEXTBOOKS:

1. Analog and Digital Communications – Simon Haykin, John Wiley, 2005.
2. Electronics Communication Systems-Fundamentals through Advanced-Wayne Tomasi, 5th Edition, 2009, PHI.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Course Outcomes:

Upon completing this course, the student will be able to

- Analyze and design of various continuous wave and angle modulation and demodulation techniques
- Understand the effect of noise present in continuous wave and angle modulation techniques.
- Attain the knowledge about AM , FM Transmitters and Receivers
- Analyze and design the various Pulse Modulation Techniques.
- Understand the concepts of Digital Modulation Techniques and Baseband transmission.

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-IV

Course Code	DCSE408(E)
Course Title	**Linux & Shell Programming**
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- To understand the usage of UNIX inter process communications (IPC).
- To control the resources with various commands .

Unit -I

Linux Utilities: File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities, Backup utilities Sed - Scripts, Operations, Addresses, Commands,,awk - Execution, Fields and Records, Scripts, Operations, Actions, Assocoative Array, Strings and Mathematical functions, System commands in awk, Applications. Shell programming with Bourne Again Shell (bash): Introduction, Shell responsibilities, Pipes and redirection, here documents, Running a shell script, Shell as a programming language, Shell meta characters, File-name substitution, Shell variables, Command substitution, Shell commands, The environment, Quoting, test command, Control structures, Arithmetic in shell, Shell script examples, Interrupt processing functions, Debugging shell scripts

Unit-II

Files and Directories: File concepts, File types File system structure,file metadata - Inodes, kernel support for files, System calls for the file I/O operations- open,create,read,wrirte,close,lseek,dup2,file status information-stat family, file and record locking-fcntl function, file permissions- chmod, fchmod, file ownership-chown, lchown, fchown, links-soft links and hard links- symlink, link, unlink. Directories: Creating,,removing and changing Directories-mkdir,rmdir,chdir,obtaining current working directory-getcwd,directory contents,scanning directories- opendir, readdir, rewin functions.

Unit- III

Process: Process concept, Layout of a C program image in main memory, Process environment – environment list, environment variables, getenv, setenv, Kernel support for process, Process identification, Process control - Process creation, replacing a process image, waiting for process, Process termination, Zombie process, Orphan process, ,system call interface for process management – fork, vfork, exit, wait, waitpid, exec family, process groups, sessions and controlling Terminal, differences between threads and processes. Signals: Introduction to signals,

Signal generation, Signal handling, Kernel support for signals, signal function, Unreliable signals, Reliable signals, Signal functions: kill, raise, alarm, pause, abort, sleep.

Unit- IV

Inter process Communication: Introduction to IPC,IPC between processes on a single computer system, IPC between processes on different systems, Pipes-creationIPC between related processes using FIFOs(Named pipes), differences between unnamed and named pipes, popen and pclose library functions. Message Queues: Kernel support for messages, APIs for message queues, Client/Server example Semaphores: Kernel support for semaphores, APIs for semaphores, file locking with semaphores.

Unit-V

Shared Memory: Kernel support for Shared Memory, APIs for Shared Memory, Shared Memory example Sockets: Introduction to Berkley Sockets, IPC over a network, client – server model, Socket address structures (Unix domain and internet domain) , Socket system calls for connection oriented protocol and connectionless protocol, example- client/server programs- single server- client connection, multiple simultaneous clients, socket options- setsockopt and fcntl system calls, comparison of IPC mechanisms.

Course Outcomes:

Students will be able to

o   Understand basics of Unix Operating System and File System.

o   Discuss the history and development of Linux Operating System.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

o Unix Operating System, Understanding Open Source, Linux Origins, Distributions, Linux Principles, linux vs windows. Understand Linux usages and basics

Text Books

1. Unix System Programming using C++, T.Chan, PHI (Unit III to Unit VIII)
2. Unix Concepts and Applications, 4th Ed, Sumitabha Das, TMH
3. Unix Network Programming, W.R.Stevens,PHI.

Reference Books

1. Begining Linux Programming, 4th Edition, N. Matthew, R.Stones, Wrox, Wiley India Edition.
2. Unix for Programmers 3rd Ed, Graham Glass & King Ables, Pearson Education.
3. System Programming with C and Unix, A.Hoover, Pearson.
4. Unix System Programming, communication, concurrency and Threads, K.A. Robbins andS.Robbins, Pearson Education.

5. Unix Shell Programming, S.G. Kochan and P.Wood, 3rd edition, Pearson Education.
6. Shell Scripting, S.Parker, Wiley India Pvt. Ltd.
7. Advanced Programming in the Unix Environment, 2nd Ed, W.R.Stevens, Pearson Education
8. Unix and Shell Programming, B.A. Forouzan & R.F.Gilberg, Cengage Learning
9. Linux System Programming, Robert Love, O'Reily, SPD.
10.   C Programming Language,Kernighan and Ritchie, PHI

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)
SEMESTER-IV

Course Code	DCSE408(E)
Course Title	**Introduction to Graph Theory**
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

Able to define the basic concepts of graphs, directed graphs, and weighted graphs.

Defines a graph, identifying edges and vertices.

Finds the degree of a vertex.

Express and prove handshaking lemma.

UNIT I

Introduction: Graphs and its applications, Finite and infinite graphs, incidence and degree, isolated Vertex, pendant Vertex, and Null graph, paths and circuits, isomorphism, sub graphs, walks, paths, and circuits, connected graphs, disconnected graphs and components, Connectivity checking algorithm, Euler graphs, Operations on graphs, more on Euler graphs, Hamiltonian paths and circuits, Travelling Salesman problem.

UNIT II

Trees and Fundamental circuits: Trees and its properties, Distance and centres in a tree, Algorithm for checking if a graph is Tree, Partial k-trees, Dynamic Programming in partial ktrees, Spanning trees, Spanning trees in a Weighted graph, Prim's and Kruskal's algorithms Cutset and cut vertices: Properties of a cut set, Fundamental circuits and cut sets, connectivity and separability, Computing connected components, Menger's theorem, Network flows, 1- Isomorphism, 2-Isomorphism.

UNIT III

Planar and Dual Graphs: Planar graph, Kuratowski's Graphs, Representations of a planar graph, Detection of planarity, Planar Separator Theorem, Geometric Dual, Combinatorial, Duel, Thickness and crossings, Algorithms for finding Clique and maximum clique.

UNIT IV

Matrix Representation of Graphs: Incidence matrix, Adjacency matrix, Adjacency list, Circuits Matrix, Fundamental Circuit Matrix and RankofB, Cut-set Matrix, Relationships among Af, Bf and Cf, path Matrix.

UNIT V

Coloring, Covering and partitioning: Chromatic number, Chromatic partitioning, Chromatics polynomial, Coverings, Four colour problem, Algorithm for graph colouring. Directed Graphs: Digraphs and its types, Digraphs and binary Relations, Directed paths and connectedness, Euler Digraphs, Trees with Directed Edges, Fundamental Circuitsin Digraphs, Matrices A,B and C of Digraphs, Adjacency Matrix of a Digraph, Paired Comparisons and Tournaments, Acyclic Digraphsand De-cyclization.

Text Books:

1. Deo Narasingh, Graph Theory with Applications to engineering and Computer Science, Prentice Hall of India, 2001.
2. Raman Tulasi and Swamy M.N.S., Graph, Networks and Algorithms, John Wiley, 1981.

Reference Books:

1. West Douglas B., Introduction to Graph theory, Pearson Education, 2002.
2. Harary F., Graph Theory, Addison Wesley/ Narosa, 1998.
3. Reingold E. M., Nievergelt J., Deo N., Combinatorial Algorithms: Theory and Practice, R.

Course outcomes:

On the completion of the course, students will be

- able to define the basic concepts of graphs, directed graphs, and weighted graphs.
- define a graph, identifying edges and vertices.
- able to find the degree of a vertex.

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-IV

Course Code	DCSE451(E)
Course Title	Object Oriented Programming with C++ Lab
Credits	1(L: 0T: 0 P: 2)

List of Experiment:

1. Implementation of Classes and Objects.

2. Implementation of Function Over loading.

3. Implementation of Inline function.

4. Implementation of Call by Value and Call by reference.

5. Implementation of Function Overloading.

6. Implementation of Static data and member function.

7. Implementation of Objects as arguments.

8. Implementation of Array of Objects.

9. Implementation of Static and Dynamic Objects.

10. Implementation of Constructor and Destructor.

11. Implementation of Overloading Unary operators.

12. Implementation of Overloading Binary operators.

13. Implementation of Operator Overloading using friend function

14. Implementation of Data conversion.

15. Implementation of all types of Inheritance. Implementation of Virtual functions.

16. Implementation of Template functions and template class.

17. Implementation of Sequential and Random accessing of Files.

18. Implementation of Exception Handling mechanism.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-IV

Course Code	DCSE451(E)
Course Title	Database Management System Lab
Credits	1(L: 0T: 0 P: 2)

Consider the following tables: emp(empno, ename ,job ,mgr ,hiredate ,sal, comm, eptn, gr), dept(deptno ,dname ,loc)

Write the following queries:

1. List all employee names along with their salaries from emp table.
2. List all information about all department from emp table.
3. List all department numbers, employee numbers and their managers numbers in descending order of deptno from emp table.
4. List department names and locations from the dept table.
5. List the employees belonging to the department 20.
6. List the name and salary of the employees whose salary is more than 1000.
7. List the names of the clerks working in the department 20.
8. List the names of analysts and salesmen.
9. List the details of the employees who have joined before the end of September 81.
10. List the names of employees who are not managers.
11. List the names of employees whose employee number are 7369, 7521, 7839, 7934,7788.
12. List the employee details not belonging to the department 10, 30, and 40.
13. List the employee name and salary, whose salary is between 1000 and 2000.
14. List the employee names, who are not eligible for commission.(salary having

>15,000 eligible for commission)

15. List the employees who are eligible for commission.
16. List the details of employees, whose salary is greater than 2000 and commission isNULL.

17. List the employees whose names start with an "S" (not"s").

18. List the name, salary and PF amount of all the employees(PF is calculated as 10% ofsalary).

19. List the empno, ename, sal in ascending order of salary.

20. List the employee name, salary, job and Department no descending order ofDepartment No and salary.

21. List the employee details in ascending order of salary.

22. List the employee details in descending order of salary

23. Display name, and sal and commission of all employees whose monthly salaryisgreater than their commission.

24. Select SMITH HAS WORKED IN THE POSITION OF CLERK IN DEPT 20.Display result in this format.

25. Generate a statement which prompts the user at runtime. The intention is to display employees hired between 2 given dates.

26. Define a variable representing an expression used to calculate total annual remuneration. Use the variable in a statement which finds all employees who earn $30000 a year or more.

27. List all the employees name and salaries increased by 15% andexpressed as a whole number of dollars.

28. Produce the following

EMPLOYEE AND JOB

SMITH   CLERK

ALLEN   SALESMAN

29. Produce the Following output:

SMITH   (Clerk)

ALLEN   (Salesman)

30. Do a case sensitive search for a list of employees with a job that the user enters.

31. It has been discovered that the sales people in dept. 30 are not all male. Please produce the Following output.

ENAME   DEPTNO   JOB

ALLEN

Sales Person

32. Display each employees name and hire date of dept 20.

33. Display each employees name, hiredate and salary review date. Assume salary review date is one year from hiredate. Output should be in ascending review date.

34. Print list of employees displaying just salary, if more than 1500. If exactly 1500 display " On Target".   If less than 1500 display "Below 1500".

35. Write a query which returns DAY of the week (i.e. MONDAY) for any date entered in the format DD/MM/YY.

36. Write a query to calculate length of service of each employee.

37. Find the minimum salary of all employees.

38. Find the maximum, minimum, and average salaries of all employees.

39. List the maximum and minimum salary of each job type.

40. Find how many managers are in each dept.

41. Find the average salary and average total remuneration of each job type. Remembers sales man earn commission.

42. Find out the difference between highest and lowest salary.

43. Find all department s which have more than three employees.

44. Check whether all employee nos are unique. (No Duplicate)

45. List lowest paid employee working for each Manager. Exclude any groups where the minimum salary is less than 1000. Sort the output by salary.

46. Produce a list showing employees 'salary grade'.(> 10000 A, >10000 &<20000 B, >20000 C)

47. Show only employee on Grade C.

48. Show all employees in Dallas.

49. List the employees name, job, salary, grade and department for everyone in the company except clerks. Sort on salary, displaying the highest first.

50. List the following details of employees who earn $36000 a year or who are clerks.

Ename   **Job**   **Annual Sal**   **Dept no**   **Dname**   **Grade**

51. Display all employees who earn less than their managers.

52. Display all employees by name and eno along with their manager's name and number.

53. Modify above spoliation to display KING who has no MANAGER.

54. Find the job that was files in the first half of 1983 and the name job that was filled in the same period in 1984.

55. Find all employees who have joined before their manager.

EMPLOYEE HIREDATE MANAGER HIRE DATE

56. Find the employees who earn the highest salary in each job, type, sort in descending order of salary.

57. Find the employees who earn the minimum salary for their job, Display the result in descending order of salary

58. Find the most recently hired employees in the department. Order by hire date.

59. Show the details of any employee who earns a salary greater than the average for their department. Sort in department number order.

60. List all departments where there are no employees.

TEXT BOOK

1. SQL, PL/SQL the programming Language of Oracle, Ivan Bayross, 4th edition

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-IV

Course Code	DCSE451(E)
Course Title	Minor Project
Credits	0(L: 0T: 0 P: 0)

Note:- A student can be allowed to do the project outside after the permission of Departmental Academic Committee.

- Those who are doing project outside but within the same city has to present their project progress every month.
- Those who are doing project outside the city can be permitted to present their project progress every fortnight through video conferencing.
- Those who are doing project at home, has to present their project progress every week.

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-V

Course Code	DCSE501
Course Title	Web Technology
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- To comprehend the basics of the internet and web terminologies.
- To introduce scripting language concepts for developing client-side applications.
- To practice server-side programming features – PHP, JSP.
- To know the usefulness of web services.

Unit-I

Internet Fundamentals :Motivation for internetworking History and scope of internet Internet protocol and standardization 1.4 Role of ISP & Factors for choosing an ISP 1.5 Internet Service providers in India 1.6 Types of connectivity such as Dial Up, Leased, VSAT etc. 1.7 Internet server and client modules on various operating systems

Unit-II

TCP/ IP : 2.1 TCP/IP internet layering model 2.2 Reliable stream transport service(TCP) 2.3 Need for stream delivery 2.4 Properties of reliable delivery service 2.5 Providing reliability 2.6 Idea behind slide windows 2.7 Ports connection and end points Segment, stream, sequence number 2.8 TCP segment format,TCP header 2.9 Acknowledgement and retransmission 2.10 Response to congestion 2.11 Establishment of a TCP connection 2.12 Closing TCP connection

2.13 TCP connection reset 2.14 Connectionless data gram delivery (Internet Protocol) 2.15 Concept of unreliable delivery service 2.16 Purpose of internet protocol,IP header 2.17 Routing in an internet 2.18 Direct and Indirect delivery 2.19 Table driven IP routing 2.20 Default routs

2.21 Benefits of TCP/IP 2.22 Subnet Address Extension 2.23 subnet Addressing 2.24 Minimizing network numbers 2.25 Transparent routers 2.26 Flexibility in subnet address assignment 2.27

Implementation of subnet with mask 2.28 Subnet mask representation 2.29User Data gram Protocol 2.30Introduction to UDP 2.31Format of UDP message 2.32Domain Name System Internet addressing 2.33 IP address/domain name address; 2.34Mapping of domain name to address 2.35 Domain name resolution

Unit-III

Internet Application and Services: 3.1 Email 3.2 Email networks 3.3 Email protocols 3.4 Formatof an email address 3.5 Email routing 3.6 Email clients, POP3, IMAP 3.7 FTP 3.8 Public domainsoftware 3.9 Types of FTP servers 3.10 FTP clients 3.11 Telnet 3.12 Telnet protocols 3.13 Server domain 3.14 Telnet clients 3.15 Terminal emulation 3.16 Internet Relay Chat 3.17 IRC network and servers 3.18 Channels

Unit-IV

E-Commerce: 4.1 Introduction to Electronic commerce 4.2 Modes of electronic commerce 4.3 Electronic data interchange 4.4 Migration to OPEN EDI 4.5 Electronic commerce with www/Internet 4.6 Different types of Electronics Payment SystemCredit card, Debit card, Smart Card, E-Cash ,E-Wallet

Unit-V

Web Publishing and Browsing: 5.1 Overview, SGML, HTML 5.2 Web hosting 5.3 CGL, Documents Interchange Standards 5.4 Components of Web Publishing, Document management

5.5 Web Page Design, Consideration and Principles 5.6 Search and Meta Search Engines 5.7 WWW, Browser, HTTP, Publishing Tools

Unit-VI

Interactivity Tools: CGI, XML, ActiveX, VB Script, JAVA Script, Front Page, AdobeDreamweaver, Flash.

Learning Outcomes:

The students will be able to:

o   Analyze a web page and identify its elements and attributes.

o   Create web pages using XHTML and Cascading Style Sheets.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

o Build dynamic web pages using JavaScript (Client side programming).

o Create XML documents and Schemas.

References

1. Internet working with TCP/IP VOl-1 : Principles Protocol and Architecture by-Douglas E Comer -PHI

2. Internet working with TCP/IP VOL-2 : Design , Implementation and Internals by- Douglas E Comer, David L. Stevens- PHI

3. HTML: the Definitive guide –lby Chuck Musciano & Bui Kennedy

4. Learning PHP, MySQL & JavaScript with jQuery, CSS & HTML5 by Robin Nixon

5. JSP 2.0: The Complete Reference, Second Edition by Phillip Hanna

6. PHP and MySQL Training Guide by Ramesh Bangia

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-V

Course Code	DCSE502
Course Title	Java Programming
Credits	3(L: 0T: 0 P: 0)

Course Objectives:

- To learn how to implement object-oriented designs with Java.
- To identify Java language components and how they work together in applications.
- To design and program stand-alone Java applications.
- To learn how to design a graphical user interface (GUI) with Java Swing.

Unit-I

Introduction to object oriented methodology: 1.1 object oriented approach 1.2 need ofobject oriented programming

Unit-II

Introduction to Java: 2.1 Features Of Java 2.2 Java distributions 2.3 Differences betweenC,C++, Java 2.4 Java Architecture 2.5 JVM Architecture 2.6 Difference between JRE, JDK and JVM 2.7 your First Java Program

Unit-III

Implementation of java features: 3.1 Class, object, data types, array, matrix, string, members, access specifies 3.2 inheritance,types of inheritance, polymorphism, types of polymorphism etc

Unit-IV

Package: 4.2 importance of package 4.2 implementation of package 4.3 setting up of class path for package

Unit-V

Java I/O : 5.1 different built_in classes for file handling in java 5.2 creation & deletion of directory 5.3

creation of files, copying of files, transferring of files etc

Unit-VI

Exception Handling: 6.1 importance of exception handling 6.2 try-catch-finally block

Unit-VII

Multi-Threaded Programming: 7.1 Thread, difference between single threaded and multithreaded programming 7.2 Implementation of multithreaded programming through simple programs.

Unit-VIII

Network Programming: 8.1 implementation of TCP/IP and client-server model basedsimple network programming

Unit-IX

GUI Programming: 9.1 Basics of AWT and Swing 9.2 Difference between AWT and Swing 9.3 Creation of simple GUI programs such Applet etc.

Unit-X

Database connectivity with JDBC: 10.1 concept of database connectivity 10.2 JDBC VS ODBC 10.3 Management of database (mysql/oracle) using simple java swing.

Course Outcomes:

Intended Outcomes for the course:

- Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.

- Read and make elementary modifications to Java programs that solve real-world problems.

- Validate input in a Java program.

References:

1. Java: The Complete Reference (Latest Edition)
2. Java Programming LanguageBy Ken Arnold, James Gosling, David Holmes
3. Programming With Java:A Primer 3E by E. Balaguruswamy
4. Different websites providing lecture notes/ppt/pdf on java

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-V

Course Code	DCSE503
Course Title	Theory of Computation
Credits	3(L: 0T: 0 P: 0)

Course objectives:

- To Design grammars and recognizers for different formal languages.
- Prove or disprove theorems in automata theory using its properties.
- Determine the decidability and intractability of computational problems.

UNIT - I

FINITE AUTOMATA (FA): Introduction, Deterministic Finite Automata (DFA) -Formal definition, simpler notations (state transition diagram, transition table), language of a DFA. Nondeterministic Finite Automata (NFA)- Definition of NFA, language of an NFA, Equivalence of Deterministic and Nondeterministic Finite Automata, Applications of Finite Automata, Finite Automata with Epsilon Transitions, Eliminating Epsilon transitions, Minimization of Deterministic Finite Automata, Finite automata with output (Moore and Mealy machines) and Inter conversion.

UNIT - II

REGULAR EXPRESSIONS (RE): Introduction, Identities of Regular Expressions, Finite Automata and Regular Expressions- Converting from DFA's to Regular Expressions, Converting Regular Expressions to Automata, applications of Regular Expressions. REGULAR GRAMMARS: Definition, regular grammars and FA, FA for regular grammar, Regular grammar for FA. Proving languages to be non-regular -Pumping lemma, applications, Closure properties of regular languages.

UNIT - III

CONTEXT FREE GRAMMER (CFG): Derivation Trees, Sentential Forms, Rightmost and Leftmost derivations of Strings. Ambiguity in CFG's, Minimization of CFG's, CNF, GNF, Pumping Lemma for CFL's, Enumeration of Properties of CFL (Proof's omitted).

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

UNIT – IV

PUSHDOWN AUTOMATA: Definition, Model, Acceptance of CFL, Acceptance by Final State and Acceptance by Empty stack and its Equivalence, Equivalence of CFG and PDA. TURING MACHINES (TM): Formal definition and behaviour, Languages of a TM, TM as accepters, and TM as a computer of integer functions, Types of TMs.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

UNIT V

RECURSIVE AND RECURSIVELY ENUMERABLE LANGUAGES (REL): Properties of recursive and recursively enumerable languages, Universal Turing machine, The Halting problem, Undecidable problems about TMs. Context sensitive language and linear bounded automata (LBA), Chomsky hierarchy, Decidability, Post's correspondence problem (PCP), undesirability of PCP.

Course Outcome:

At successful completion of the course, students should:

Demonstrate advanced knowledge of formal computation and its relationship to languages.

Distinguish different computing languages and classify their respective types.

Recognize and comprehend formal reasoning about languages.

TEXT BOOKS:

1. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman (2007), Introduction to AutomataTheory Languages andComputation, 3rdedition, Pearson Education, India.

REFERENCE BOOKS:

1. K. L. P Mishra, N. Chandrashekaran (2003), Theory of Computer Science-AutomataLanguages and Computation, 2nd edition, Prentice Hall of India, India.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-V

Course Code	DCSE551
Course Title	Web Technology Lab
Credits	1(L: 0T: 0 P: 2)

List of Experiments:

- Installation of network components under NT or 95/98/LINUX

- Installation of TCP/IP

- Installation of Intranet

- Configuration of one web server

- Deployment of HTML files in Intranet servers

- Creation of HTML pages, using tags

- Creation of tables and lists using HTML

- Creation of simple forms incorporating GUI components 9(command button, textbox, radio button, check box, combo box) in HTML pages

- Frames in HTML

- Practical on different Internet services(WWW, Mail, FTP, Chat)

- Practical on Java script(Basics ,if else conditional statement, loop, function, eventhandler etc)

- PHP Basics, Web hosting and simple web application development

- JSP Basics

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-V

Course Code	DCSE553
Course Title	Java Programming Lab
Credits	1(L: 0T: 0 P: 2)

List of Experiments:

1. Implementation of inheritance & polymorphism.

2. Implementation of the concept of package and setting up of classpath.

3. File handling -creation & deletion of directory, creation of files, copying of files, transferringof files etc.

4. Handling of Exception.

5. Implementation of Multithreaded programming through simple programs.

6. Implementation of the concept of TCP/IP based client-server model.

7. Creation of GUI based simple programs.

8. Implementation of JDBC through simple programs.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-V

Course Code	DCSE554
Course Title	Summer Internship-II
Credits	2(L: 0T: 0 P: 0)

Note: - A student can be allowed to do the internship outside after the permission of Departmental Academic Committee.

- Those who are doing internship outside but within the same city have to present their internship progress every month.
- Those who are doing internship outside the city can be permitted to present their internship progress every fortnight through video conferencing.
- Those who are doing internship at home, has to present their internship progress every week.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-V

Course Code	DCSE554
Course Title	Major Project-I
Credits	1(L: 0T: 0 P: 0)

Note:- A student can be allowed to do the project outside after the permission of Departmental Academic Committee.

- Those who are doing project outside but within the same city has to present their project progress every month.
- Those who are doing project outside the city can be permitted to present their project progress every fortnight through video conferencing.
- Those who are doing project at home, has to present their project progress every week.

RKDF UNIVERSITY RANCHI

DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER -VI

Course Code	DCSE601
Course Title	Introduction to AI
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- Develop the problem-solving ability. ...

- Incorporate knowledge representation. ...

- Facilitate planning. ...

- Allow continuous learning. ...

- Encourage Social Intelligence. ...

- Promote creativity. ...

- Achieve General Intelligence. ...

- Promote synergy between humans and AI.

Unit-I

Introduction: Overview of Artificial intelligence- Problems of AI, AI technique, Tic - Tac - Toe problem. Intelligent Agents: Agents & environment, nature of environment, structure of agents, goal based agents, utility based agents, learning agents. Problem Solving : Problems, Problem Space & search: Defining the problem as state space search, production system, problem characteristics, issues in the design of search programs.

Unit-II

Search techniques: 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. Heuristic search strategies: 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: Games, optimal decisions & strategies in games, the minimax search procedure, alpha-beta pruning, additional refinements, iterative deepening.

Unit-III

Knowledge & reasoning: Knowledge representation issues, representation & mapping, approaches to knowledge representation, issues in knowledge representation. Using predicate logic: Representing simple fact in logic, representing instant & ISA relationship, computable functions & predicates, resolution, natural deduction. Representing knowledge using rules: Procedural verses declarative knowledge, logic programming, forward verses backward reasoning, matching, control knowledge. Probabilistic reasoning 3 Hrs Representing knowledge in an uncertain domain, the semantics of Bayesian networks, DempsterShafer theory, Fuzzy sets & fuzzy logics.

Unit-IV

Planning: Overview, components of a planning system, Goal stack planning, Hierarchical planning, other planning techniques. Natural Language processing : Introduction, Syntactic processing, semantic analysis, discourse & pragmatic processing.

Unit-V

Learning: Forms of learning, inductive learning, learning decision trees, explanation based learning, learning using relevance information, neural net learning & genetic learning. Expert Systems: Representing and using domain knowledge, expert system shells, knowledge acquisition. Basic knowledge of programming language like Prolog & Lisp.

Text 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

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

6. Expert Systems, Giarranto, VIKAS

7. Artificial Intelligence, Russel, Pearson

Learning Outcomes:

- Design user interfaces to improve human–AI interaction and real-time decision-making.

- Evaluate the advantages, disadvantages, challenges, and ramifications of human–AI augmentation.

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SEMESTER-VI

Course Code	DCSE602
Course Title	Entrepreneurship
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- The purpose of the course is that the students acquire necessary knowledge and skills required for organizing and carrying out entrepreneurial activities.
- To develop the ability of analysing and understanding business situations in which entrepreneurs act .
- To master the knowledge necessary to plan entrepreneurial .

Unit-I

Entrepreneurship- Definition, Characteristics and Importance, Types and Functions of an Entrepreneur, Merits of a Good Entrepreneur & Motivational Factors of Entrepreneurship.

Unit-II

Motivation to Achieve Targets and Establishment of ldeas. Setting Targets and Facing Challenges. Resolving problems and creativity. Sequenced planning and guiding capacIty, Development of Self Confidence. Communication Skills, Capacity to Influence, Leadership.

Unit Ill

Project Report - Evaluation of Selection Process. Detailed Project Report - Preparation of main part of a project report pointing out necessary and viability. Selecting the form of Organization - Meaning and characteristics of Sole Proprietorship, Partnership and Cooperative Committees, Elements Affecting Selection of a form of an Organisation. Economic Management- Role of Banks and Financial Institutions Banking, Financial Plans, Working Capital-Evaluation and Management, Keeping of Accounts.

Unit- IV

Production management. Methods of Purchase. Management of Movable Assets/Goods. Quality Management. Employee Management. Packaging. Marketing Management. Sales and the Art of Selling. Understanding the Market and Market Policy. Consumer Management. TimeManagement.

Unit- V

Role of regulatory institutions - District Industry Centre, Pollution Control Board, Food and Drug Administration, Special Study of Electricity Development and Municipal Corporation. Role of Development Organizations - Jharkhand State Khadi & Gram Udyog Board, Jharkhand State Mineral Development Corporation Ltd., etc. ,Self-employment-oriented schemes, Prime Minister's Employment schemes, Golden Jubilee Urban Environment Scheme, Rani Durgavati Self-Employment scheme/Pt. Deendayal Self Employment Scheme. d) Various grant schemes- Cost-of-Capital Grant, Interest Grant, Exemption from Entry Tax, Project Report, Reimbursement Grant, etc. (C)Role of Women Entrepreneurship in India, Women's Development Corporations (WDCs), Special Incentives for Women Entrepreneurs, Prospects & Possibilities

Reference Books :

1. Leadership in Organisation - Published by I.S.T.E. Mysore
2. Motivation - Published by I.S.T.E. Mysore
3. Motivation - I.I.T. Kanpur - Published by I.S.T.E. Mysore
4. AA Hand book on Project Appraisal and follow up, Govind Prakashan, 204, Saraswati Kunj,90, S. V. Road, Goregoan, Bombay-400 062. - D. P. Sarda
5. Bihar Industrial Policy - Government of Bihar, Department of Industries.
6. Entrepreneurship Guide - Bihar State Financial Corporation, Fraser Road, Patna800 001

Learning Outcomes:

- Students increase their awareness and deliberately practice the skills and disciplines necessary to increase confidence and agency;
- Foster self-efficacy and self-advocacy;
- Improve communication and problem-solving skills,

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-VI

Course Code	DCSE603
Course Title	Hardware Installation and Maintenance
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- Students will develop the skills to identify the basic functionality of the operating system.
- Perform basic troubleshooting techniques, utilize proper safety procedures.
- Effectively interact with customers and peers.

Unit -I

Computer Installation: Site Preparation- Air-Conditioning Requirements, False-Ceiling and False-flooring, Fire-Protection system, Electrical Earthling, Power Supply Requirements-Clean Power Supply, Power Supply Problems, Power Conditioning, Power Protection equipmentsSpike Suppressor, CVT, UPS (Online and Off-line), SMPS

Unit -II

Safety and Security Measures: Safety from Natural calamities, Theft and Fire Hazards, Data Security-Security from unauthorized users, Virus Protection Techniques, Firewalls, Folder Locking

Unit -III

Working Principles of peripheral devices: Keyboard: Wired and wireless, Optical Mouse: Wired and Wireless, Scanner, OCR, OMR, MICR and BCR (Bar Code Reader), Printers: DotMatrix Printer (DMP), Inkjet Printer, Laser Printer, Modem: Dialup, Wired Broadband, Wireless Broadband, Digital Camera , Web-cam and Microphone (MIC), USB Flash memory (Pen drive)

Unit -IV

Display Technologies-Thin Displays: Cathode Ray tube (CRT) Display, Liquid Crystal Display (LCD), Plasma Display I/O Ports: Serial Port, Parallel Port, Game Port, USB Port, HDMI Port

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Unit-V

Hard Disk Drive (HDD): Working Principle, HDD Controller, HDD Interface types: SCSI, IDE, and SATA, USB External Hard disk, Memory: RAM, SDRAM, DDR, ROM Optical Storage Devices: Optical Storage Media, CD-Drive-Installation and Operation, Digital Versatile Disc (DVD)- Technology Windows Components and Tools: Windows Registry, Scandisk and DiskDefragmenter, Disk management, File Systems-FAT16, FAT32, and NTFS

Reference Books:

1. Computer Installation and Servicing D Balasubramanian, TMH
2. The Complete Reference PC Hardware Craig Zacker, John Rourke, TMH
3. IBM PC and Clones B. Govidarajalu, TMH
4. The Complete PC Upgrade and Maintenance Guide Mark Minasi, Wiley-India

Learning Outcomes:

- Students will develop the skills to identify the basic functionality of the operating system.
- perform basic troubleshooting techniques.
- utilize proper safety procedures.
- effectively interact with customers and peers.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-VI

Course Code	DCSE604
Course Title	System Analysis and Design
Credits	3(L: 3T: 0 P: 0)

Course Objectives:

- The course encourages interpersonal skill development with clients, users, and personnel involved in development, operation, and maintenance of a system.
- Quality issues such as software testing, configuration management, quality management, and process improvement are addressed throughout the course.

Unit – I

Overview of System Analysis & Design Definition, Characteristics, System Concepts, Elements and Types. System Development Life Cycle Impetus for change, Steps involved in SDLC, People involved SDLC. Initial Investigation Background Analysis, Fact finding techniques, tools for Information gathering, types of interviews and questionnaires.

Unit – II

Structured Analysis Definition, tools for structured analysis. Feasibilit Study Definition, Considerations Technical, Economic, Behavioral & Political, Steps in Feasibility Study, Feasibility Report. Cost Benefit Analysis (CBA) Categories Hardware, Personnel, Facility, Operating and Supply Costs, Proce dure for CBA Determination.

Unit – III

System Design-Definition, Process of Design, Structured Design, Elements of Functional Decomposition – Module, Connection and Coupling, HIPO and IPO Charts, Major development activities of Design stage Data Validation, Audit Trial. System Testing – Why Testing ? Factors considered for testing, Test Data & Test Plan, Phases of Testing, Types of system tests.

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Unit – IV

Quality Assurance – Definition, Goals in System Life Cycle, Levels of Quality Assurance, Tresting. Implementation – Conversion, Stages of Conversion, Combating resistance to change, Post Implementation Review, Review Plan. Software Maintenance – Maintenance/Enhancement, Activities of a Maintenance procedure, reducing maintenance costs

Unit – V

System Security – Data Security, Threats to System Security, Risk Analysis, Control Measures, System Audit, Protection Againts VIRUS. Hardware and Software Selection – Hardware/Software Suppliers, Procedure for Hardware/Software Selection, Major Phases in Selection. Types of Software, Attributes of Software, Criteria for Software Selection, Evaluation Process. Financial Consideration in Selection – Rental, Lease, Purchase Options.

Learning Outcomes:

o Define and use common System Analysis and Design fundamental terminology.
o Utilize current Analysis and Design tools to graphically characterize processes and flows in a business system.

TEXT BOOKS:

1. System Analysis and Design - by Elias M Awad.
2. System Analysis & Design – by V K Jain, Dreamtech Press.
3. System Analysis & Design – by Theoroff.

REFERENCE BOOKS:

1. Computers Today – by Suresh K Basandra.
2. Modern System Analysis & Design by A Hoffer, F George, S Valaciah, Low price Edn. Pearson Education.
3. Information Technology & Computer Applications – by V.K. Kapoor, Sultan Chand & Sons, New Delhi.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-VI

Course Code	DCSE605(E)
Course Title	Microprocessor and Interface
Credits	3(L: 3T: 0 P: 0)

Course Objective:

- To provide solid foundation on the fundamentals of microprocessors and applications.Interfacing the external devices to the processor according to the user requirements.

- Enabling to create novel products and solutions for real time problems.

UNIT–I

Basic 80x86 Architecture Role of Microprocessor in Micro Computer – Brief history of Microprocessors (with specific insight into x86 family) - Features of 8086 Internal Block Diagram of 8086 – Execution Unit – Bus Interface Unit – Addressing Modes Hardware structure of 8086- Pin Configuration-Clock- Processor activities (Interrupt, DMA, etc.)- Maximum mode- Instruction cycle Assembly process – Assemblers for x86 – Instruction Design

UNIT – II

Programming of x86 processor Data transfer Instructions- Branch instructions- Arithmetic instructions-Shift and Rotate InstructionsString Instructions- Procedures- Macros-Number Format Conversions-ASCII operations

UNIT – III

Interrupt mechanism of x86 & Interfacing of chips Interrupts of 8086- Dedicated Interrupt types-Software interrupts-Hardware interrupts- Priority of interrupts-Programmable Interrupt Controller (8259) Organisation and Interfacing of PPI (8255), and Keyboard and display Interface (8279)

UNIT –IV

Advanced Processor technologies Features of 80386- Real Mode - Protected Virtual Addressing Mode

Features of Pentium- pipelining- Stages of pipelining- Speedup due to pipelining- Pipeline Hazards Super scalar Processors- Multiple Execution units Multicore processing – Major issuies in Multicore Processing (interconnects- cache coherance-snooping protocol- Directory based protocol) MMX- SSE-Hyperthreading

Course Outcomes:

On completion of this course the student will be able to:

- Describe the architecture & organization of 8085 & 8086 Microprocessor.

- Understand and classify the instruction set of 8085/8086 microprocessor comparatively.

TEXT BOOK(S):

1. The x86 Microprocessors- Architecture, Programming and Interfacing – Lyla B Das – PearsonSecond edition.

2. Microprocessor and Microcontroller - R. Theagarajan – SCITECH-2010

REFERENCES:

1. The 8088 and 8086 Microprocessors – Programming, Interfacing, Software and Hardware Applications by Walter A. Triebel & Avatar Singh, Pearson Fourth Edition,

2. Microprocessor 8086 Architecture, Programming and Interfacing by Sunil Mathur, PHI,2011

3. The Intel Microprocessors : Archirecture, Programming and Interfacing- Barry B. BreyPearson -8 Edition

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-VI

Course Code	DCSE606(E)
Course Title	Wind and Solar Energy Systems
Credits	3(L: 3T: 0 P: 0)

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. Understand the energy scenario and the consequent growth of the power generation from renewable energy sources.
2. Understand the basic physics of wind and solar power generation.
3. Understand the power electronic interfaces for wind and solar generation.
4. Understand the issues related to the grid-integration of solar and wind energy systems.

UNIT 1

Physics of Wind Power:

History of wind power, Indian and Global statistics, Wind physics, Betz limit, Tip speed ratio, stall and pitch control, Wind speed statistics-probability distributions, Wind speed and power-cumulative distribution functions.

UNIT 2

Wind generator topologies*:*

Review of modern wind turbine technologies, Fixed and Variable speed wind turbines, Induction Generators, Doubly-Fed Induction Generators and their characteristics, Permanent- Magnet Synchronous Generators, Power electronics converters. Generator-Converter configurations, Converter Control.

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UNIT 3

The Solar Resource*:*

Introduction, solar radiation spectra, solar geometry, Earth Sun angles, observer Sun angles, solar day length, Estimation of solar energy availability.

UNIT 4

Solar photovoltaic*:*

Technologies-Amorphous, monocrystalline, polycrystalline; V-I characteristics of a PV cell, PV module, array, Power Electronic Converters for Solar Systems, Maximum Power Point Tracking (MPPT) algorithms. Converter Control.

UNIT 5

Network Integration Issues

Overview of grid code technical requirements. Fault ride-through for wind farms - real and reactive power regulation, voltage and frequency operating limits, solar PV and wind farm behavior during grid disturbances. Power quality issues. Power system interconnection experiences in the world. Hybrid and isolated operations of solar PV and wind systems.

Technologies, Parabolic trough, central receivers, parabolic dish, Fresnel, solar pond, elementary analysis.

Text / References*:*

1. T.Ackermann,"WindPowerinPowerSystems",JohnWileyand SonsLtd.,2005.

2. G. M. Masters, "Renewable and Efficient Electric Power Systems**,** John Wiley and Sons,2004.

3. S.P.Sukhatme,"SolarEnergy:Principlesof ThermalCollectionandStorage",McGrawHill,1984.

4. H. Siegfried and R. Waddington, " Grid integration of wind energy conversion systems" John Wiley and Sons Ltd.,2006.

5. G.N. Tiwariand M.K. Ghosal," Renewable Energy Applications",Narosa Publications,2004.

6. J. A. Duffie and W. A. Beckman, " Solar Engineering of Thermal Processes", John Wiley & Sons, 1991.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-VI

Course Code	DCSE607(E)
Course Title	PLC & SCADA
Credits	3(L: 3T: 0 P: 0)

COURSE OBJECTIVES:

To get familiar with industrial automation working with PLC and SCADA.

UNIT 1

Programmable Logic Controllers: Introduction, Parts of a PLC, Principles of Operation, Modifying the Operation, PLCs versus Computers, PLC Size and Application. PLC Hardware Components: The I/O Section, Discrete I/O Modules, Analog I/O Modules, Special I/O Modules, I/O Specifications, The Central Processing Unit (CPU), Memory Design, Memory Types, Programming Terminal Devices, Recording and Retrieving Data, Human Machine Interfaces (HMIs). Basics of PLC Programming: Processor Memory Organization, Program Scan, PLC Programming Languages, Relay-Type Instructions, Instruction Addressing, Branch Instructions, Internal Relay Instructions, Programming Examine If Closed and Examine If Open Instructions, Entering the Ladder Diagram, Modes of operation

UNIT 2

Developing Fundamental PLC Wiring Diagrams and Ladder Logic Programs: Electromagnetic Control Relays, Contactors, Motor Starters, Manually Operated Switches, Mechanically Operated Switches, Sensors, Output Control Devices, Seal-in Circuits, Latching Relays, Converting Relay Schematics into PLC Ladder Programs, Writing a Ladder Logic Program Directly from a Narrative Description. Programming Timers: Mechanical Timing Relays, Timer Instructions, On-Delay Timer Instruction, Off-Delay Timer Instruction, Retentive Timer, Cascading Timers.

UNIT 3

SCADA Fundamentals: Introduction, Open system: Need and advantages, Building blocks of SCADA systems, Remote terminal unit (RTU): Evolution of RTUs, Components of RTU, Communication subsystem, Logic subsystem, Termination subsystem.

UNIT 4

Human-Machine Interface (HMI): HMI components, HMI software functionalities, Situational awareness, Intelligent alarm filtering: Need and technique, Alarm suppression techniques, Operator needs and requirements,

UNIT 5

SCADA Systems: Building the SCADA systems, legacy, hybrid, and new systems, Classification of SCADA systems, SCADA implementation: A laboratory model: The SCADA laboratory, System hardware, System software, SCADA lab field design.

Course Outcomes:

Upon successful completion of this course, the students will be able to :-

- Develop block diagram of PLC and explain the working.
- Classify input and output interfacing devices with PLC.

Text Books:

1. Programmable Logic Controllers Frank D Petruzella McGraw Hill 4th Edition, 2011
2. Power System SCADA and Smart Grids Mini S. Thomas CRC Press 3rd Edition,2015

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-VI

Course Code	DCSE608(E)
Course Title	Remote Sensing and GIS
Credits	**3(L: 3T: 0 P: 0)**

Course Objectives:

- To understand the principles, applications, trends, and pertinent issues of geographical information systems and sciences, including remote sensing (RS), Photogrammetry, cartography, and global positioning systems (GPS).

- To provide learning and teaching experiences with real world problems.

REMOTE SENSING & GIS

1. Remote Sensing: Definition and Development; Platforms and Types;Photogrammetry.

2. Satellite Remote Sensing: Principles, EMR Interaction with Atmosphere and EarthSurface; Satellites (Landsat and IRS); Sensors

3. Geographical Information System (GIS): Definition and Components.

4. Global Positioning System (GPS) – Principles and Uses; DGPS.

5. GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector DataStructure.

Course Outcomes:

On the completion of the course, Students will be able to

- o Understand the concepts of Photogrametry and compute the heights of objects.

- o Understand the principles of aerial and satellite remote sensing.

- o Able to comprehend the energy interactions with earth surface features, spectral properties of water bodies .

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Text Books:

1. Bhatta , B. (2008) Remote Sensing and GIS, Oxford University Press, New Delhi.

2. Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press

3. Jensen, J. R. (2005) Introductory Digital Image Processing: A Remote Sensing.

4. Bhatta, B. (2010) Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg.41

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

Semester-VI

Course Code	DCSE553
Course Title	AI LAB
Credits	1(L: 0T: 0 P: 2)

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/ CLIP

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

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SEMESTER-VI

Course Code	**DCSE554**
Course Title	Hardware Installation andMaintenance Lab
Credits	**1(L: 0T: 0 P: 2)**

List of Experiments:

1. Study and Identify of various parts of a PC
2. Creating Disk Partitions and formatting them.
3. Installation of Windows Operating System.
4. Installation of Linux Operating system.
5. Installation of Operating Systems using VMWARE utility
6. Installation of Network Interface Card (NIC) or LAN card
7. Installation of Local Printer
8. Installation of Network Printer
9. Installation of Scanner
10. Use PING command to verify the TCP/IP connection between two nodes.
11. To login to remote Desktop using Team Viewer utility.
12. To prepare a Straight cable using standard color coding.
13. To prepare a Crossover cable using standard color coding.
14. To connect two PCs using Crossover cable without using a Switch or Router.
15. To use CD writing Software for Copying Files and Disc-to-Disc Copying.

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DIPLOMA IN COMPUTER SCIENCE (Diploma CS)

SEMESTER-VI

Course Code	DCSE655
Course Title	Seminar
Credits	**1(L: 0T: 0 P: 2)**

Note:- A student may be allowed to attend the Seminar outside after the permission of Departmental Academic Committee apart from the seminar conducted by the university.

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