w.e.f = July 2020

PROGRAMME GUIDE

DIPLOMA IN ENGINEERING (CS)
(Polytechnic Computer Science & Engineering)

*Scheme of Examination (CBCS/ELECTIVE)
*Detailed Structure of Syllabus

DR. C.V. RAMAN UNIVERSITY
KARGI ROAD, KOTA, BILASPUR, CHATTISGARH
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w.e.f July 2020

DIPLOMAINENGINEERING

Duration:36Months(3Years)

Eligibility:12thPass

COURSE STRUCTURE OF DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING SEMESTER Ist													
Course Details				External Assessment		Internal Assessment				Credit Distribution			Allotted Credits
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wise Distribution
				MaxMarks	Min Marks	MaxMarks	Min Marks	MaxMarks	Min Marks				
Theory Group													
2TDDE 101	Basic Science	Mathematics-I	100	50	17	20	07	30	15	2	1	0	3
2TDDE 102	Engineering Science Course	Applied Mechanics	100	50	17	20	07	30	15	2	1	0	3
2TDDE 103	Basic Science	Physics	100	50	17	20	07	30	15	2	1	0	3
2TDDE 104	Mandatory Course	Environment Engineering& safety	100	50	17	20	07	30	15	2	1	0	3
2TDDE 105	Humanities	Communication Skills-I	100	50	17	20	07	30	15	2	1	0	3
Practical Group				Term End Practical Exam				Sessional					
2TDDE 102	Engineering Science Course	Applied Mechanics	50	25	12			25	12	-	-	1	1
2TDDE 103	Basic Science	Physics	50	25	12			25	12	-	-	1	1
2TDDE 105	Humanities	Communication Skills-I	50	25	12			25	12	-	-	1	1
Grand total			650							10	5	3	18

Minimum Passing Marks are equivalent to Grade D

L- Lectures T- Tutorials P- Practical

Major- Term End Theory / Practical Exam

Minor- Pre-University Test

Sessional weightage – Attendance 50%, Three Class Tests/ Lab Performance Assignment 50%

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Duration:36Months(3Years)

Eligibility:12thPass

COURSE STRUCTURE OF DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING SEMESTER IInd													
Course Details				External Assessment		Internal Assessment				Credit Distribution			Allotted Credits
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wise Distribution
				Max Marks	Min Marks	MaxMarks	Min Marks	MaxMarks	Min Marks				
Theory Group													
2TDDE 201	Basic Science	Mathematics-II	100	50	17	20	07	30	15	2	1	0	3
2TDDE 202	Engineering Science Course	Engineering Graphics	100	50	17	20	07	30	15	2	1	0	3
2TDDE 203	Basic Science	Chemistry	100	50	17	20	07	30	15	2	1	0	3
2TDDE 204	Engineering Science Course	Fundamentals Computer & IT	100	50	17	20	07	30	15	2	1	0	3
2TDDE 205	Humanities	Communication Skills-II	100	50	17	20	07	30	15	2	1	0	3
Practical Group				Term End Practical Exam				Sessional					
2TDDE 203	Basic Science	Chemistry	50	25	12			25	12	-	-	1	1
2TDDE 204	Engineering Science Course	Fundamentals Computer & IT	50	25	12			25	12	-	-	1	1
2TDDE 205	Humanities	Communication Skills - II	50	25	12			25	12	-	-	1	1
Grand total			650							10	5	3	18

Minimum Passing Marks are equivalent to Grade D

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Major- Term End Theory / Practical Exam

Minor- Pre-University Test

Sessional weightage – Attendance 50%, Three Class Tests/ Lab Performance Assignment 50%

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Duration:36Months(3Years)

Eligibility:12thPass

COURSE STRUCTURE OF DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING SEMESTER IIIrd														
Course Details				External Assessment		Internal Assessment				Credit Distribution			Allotted Credits	
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wise Distribution	
				Max Marks	Min Marks	MaxMarks	Min Marks	MaxMarks	Min Marks					
Theory Group														
2TDCS-301	Professional Core	Database Management System	100	50	17	20	07	30	15	2	1	0	3	
2TDCS-302	Professional Core	Programming with C	100	50	17	20	07	30	15	2	1	0	3	
2TDCS-303	Professional Core	Computer Network Essentials	100	50	17	20	07	30	15	2	1	0	3	
2TDCS-304	Professional Core	Digital Techniques	100	50	17	20	07	30	15	2	1	0	3	
2TDCS-305	Professional Core	Operating System	100	50	17	20	07	30	15	2	1	0	3	
Practical Group				Term End Practical Exam				Sessional						
2TDCS-301	Professional Core	Database Management System	50	25	12			25	12	-	-	1	1	
2TDCS-302	Professional Core	Programming with C	50	25	12			25	12	-	-	1	1	
2TDCS-304	Professional Core	Digital Techniques	50	25	12			25	12	-	-	1	1	
Grand Total			650							10	5	3	18	

Minimum Passing Marks are equivalent to Grade D

L- Lectures T- Tutorials P- Practical

Major- Term End Theory / Practical Exam

Minor- Pre University Test

Sessional weightage – Attendance 50%,

Three Class Tests/ Lab Performance Assignment 50%

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DIPLOMAINENGINEERING

Duration:36Months(3Years)

Eligibility:12thPass

COURSE STRUCTURE OF DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING SEMESTER IVth													
Course Details				External Assessment		Internal Assessment				Credit Distribution			Allotted Credits
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wiseDistribution
				MaxMarks	Min Marks	MaxMarks	Min Marks	MaxMarks	Min Marks				
Theory Group													
2TDCS-401	Professional Core	R programming	100	50	17	20	07	30	15	2	1	0	3
2TDCS-402	Professional Core	Data Structure	100	50	17	20	07	30	15	2	1	0	3
2TDCS-403	Professional Core	Computer Architecture	100	50	17	20	07	30	15	2	1	0	3
2TDCS-404	Professional Core	Multimedia and WebTechnology	100	50	17	20	07	30	15	2	1	0	3
2TDCS-405	Professional Core	IT Trends and Technologies	100	50	17	20	07	30	15	2	1	0	3
Practical Group				Term End Practical Exam				Sessional					
2TDCS-401	Professional Core	R programming	50	25	12			25	12	-	-	1	1
2TDCS-402	Professional Core	Data Structure	50	25	12			25	12	-	-	1	1
2TDCS-404	Professional Core	Multimedia and WebTechnology	50	25	12			25	12	-	-	1	1
2TDCS-406	Professional Core	Managerial Skills											
Grand Total			650							10	5	3	18

Minimum Passing Marks are equivalent to Grade D

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Major- Term End Theory / Practical Exam

Minor- Pre University Test

Sessional weightage – Attendance 50%,

Three Class Tests/ Lab Performance Assignment 50%

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DIPLOMAINENGINEERING

Duration:36Months(3Years)

Eligibility:12thPass

COURSE STRUCTURE OF DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING SEMESTER Vth													
Course Details				External Assessment		Internal Assessment				CreditDistribution			AllottedCredits
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wiseDistribution
				MaxMarks	Min Marks	MaxMarks	Min Marks	MaxMarks	Min Marks				
Theory Group													
2TDCS-501	Professional Core	Software Engineering	100	50	17	20	07	30	15	2	1	0	3
2TDCS-502	Professional Core	Introduction to JAVA	100	50	17	20	07	30	15	2	1	0	3
2TDCS-503	Professional Core	PHP and MYSQL	100	50	17	20	07	30	15	2	1	0	3
2TDCS-504	Professional Core	Microprocessor and its Interfacing	100	50	17	20	07	30	15	2	1	0	3
2TDCS-504	Professional Core	Data Communication	100	50	17	20	07	30	15	2	1	0	3
Practical Group				Term End Practical Exam				Sessional					
2TDCS-502	Professional Core	Introduction to JAVA	50	25	12			25	12	-	-	1	1
2TDCS-503	Professional Core	PHP and MYSQL	50	25	12			25	12	-	-	1	1
2TDCS-504	Professional Core	Microprocessor and its Interfacing	50	25	12			25	12	-	-	1	1
Grand Total			650							10	5	3	18

Minimum Passing Marks are equivalent to Grade D

L- Lectures T- Tutorials P- Practical

Major- Term End Theory / Practical Exam

Minor- Pre University Test

Sessional weightage – Attendance 50%,

Three Class Tests/ Lab Performance Assignment 50%

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Eligibility:12thPass

COURSE STRUCTURE OF DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING SEMESTER VIth													
Course Details				External Assessment		Internal Assessment				CreditDistribution			AllottedCredits
Course Code	Course Type	Course Title	Total Marks	Major		Minor		Sessional ***		L	T	P	Subject wiseDistribution
				MaxMarks	Min Marks	MaxMarks	Min Marks	MaxMarks	Min Marks				
Theory Group													
2TDCS-601	Professional Core	Unix and Shell programming	100	50	17	20	07	30	15	2	1	0	3
2TDCS-602	Project Work	E-Commerce and ERP	100	50	17	20	07	30	15	2	1	0	3
2TDCS-603	Professional Elective	Professional Elective-I	100	50	17	20	07	30	15	2	1	0	3
Practical Group				Term End Practical Exam				Sessional					
2TDCS-601	Professional Core	Unix and Shell programming	50	25	12			25	12	-	-	1	1
2TDCS-603	Professional Elective	Computer Graphics and Multimedia	50	25	12			25	12	-	-	1	1
2TDCS-604	Project Work	Project Lab	200	100	50			100	50	-	-	4	4
2TDCS-605	Project Work	Entrepreneurship and innovative Skills	50	25	12			25	12	-	-	1	1
Grand Total			650							6	3	9	18

Minimum Passing Marks are equivalent to Grade D

L- Lectures T- Tutorials P- Practical

Major- Term End Theory / Practical Exam

Minor- Pre University Test

Sessional weightage – Attendance 50%,

Three Class Tests/ Lab Performance Assignment 50%

Professional Elective

1-Computer Graphics and Multimedia

2-Visual Programming

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SEMESTER- 1st **Subject Code: 2TDDE 101**
Course: Diploma CSE **Theory Max. Marks: 50**
SUBJECT:Mathematics-I **Theory Min. Marks: 17**

Course objective:• Mathematics forms backbone for all technologies and hence occupies an important place in the curriculum of polytechnic education. The subject is equally important for the future self-development of Polytechnic students. In designing the curriculum for foundation course, the admission level to Polytechnics has been considered as 10th Board examination and mathematical needs of Technical subject have been given due consideration

Unit	Unit wise course contents	Methodology Adopted
Unit – I	**Permutation:** Meaning of factorial n, Permutation of 'n' dissimilar thing taken 'r' at a time **Combination:** Combination of n dissimilar things taken 'r' at a time Binomial Theorem: Statement of the theorem for positive integer, General Term, Middle term, Constant term	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	**Partial Fractions:** Define a proper-improper fraction, Break a fraction into partial fraction whose denominator contains Linear, Repeated linear and Non repeated quadratic factors.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	**Determinant:** Concept & principles of determinants ,Properties of determinant , Simple examples. **Complex Numbers:** Algebra of Complex Numbers ,Polar form	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	**Trigonometry :**Allied angles, trigonometrical ratios of sum and difference of angles, (only statement),sum and difference of trigonometric ratios (c-d formula),multiple angles (only double angle and half angle),properties of triangle (without proof)	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	**Matrix:**Definition of matrix, types of matrix, row, column, square, unit, upper and lower triangular, symmetric & skew symmetric, singular and nonsingular matrices, Adjoint of a matrix, inverse of a matrix.	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:Through this syllabus the diploma student will learn the basic concepts of counting principle through permutation and combination , expansion of a binomial function , breaking up a complex fraction into simpler partial fractions, trigonometric ratio and concept of matrix

TEXT BOOKS:

- Engineering Mathematics , Iyenger , SRK., NarosaPublshing, New Delhi
- Engineering Mathematics I, Agarwal D.C, Meerut:Shree Sai Prakashan
- Basic Engineering Mathematics, Dass H. K., Delhi S. Chand Group
- Higher Engineering Mathematics, B.S. Grewal, Delhi, Khanna Publishing

REFERENCE BOOKS:

- Calculus ,Loomis,Addison Wesley
- Applied Mathematics, Abhimanyu singh, Anne books
- Engineering Mathematics, Dr. G Balaji, Balaji Publishers

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
	Able to provide mathematical skills	Goal 04(Quality education)	

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SEMESTER- 1st
Course: Diploma CSE
SUBJECT:Applied Mechanics

Subject Code: 2TDDE 102
Theory Max. Marks: 50
Theory Min. Marks: 17

Course objective:

- Ability to apply knowledge of mathematics, science, and engineering.
- Solve for the resultants of any force systems.
- Determine equivalent force systems.
- Determine the internal forces in plane frames, simple span trusses and beams.
- Solve the mechanics problems associated with friction forces.
- Obtain the centroid, first moment and second moment of an area.

Unit	Unit wise course contents	Methodology Adopted
Unit – I	**COMPOSITION AND RESOLUTION OF FORCES** Definition, Effect, characteristics of force, System of Forces, Principle of Transmissibility of Forces, Concept of Resultant Force, Law of Parallelogram of Forces, Triangle of Forces, Polygon of Forces, Determination of Resultant of two or more concurrent forces (analytically and graphically). **PARALLEL FORCES AND COUPLES** Classification of Parallel Forces, Methods of finding resultant Force of parallel forces- analytically graphically, Position of resultant force of parallel forces, Definition, Classification and characteristics of a force Couple, moment of couple.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	**MOMENTS AND THEIR APPLICATIONS** Definition, Types and law of moment, Varignon's Principle of moment and its applications, Lever and its Applications, Types of supports and determination of support reactions of a simply supported beam subjected to point load and uniformly distributed load (UDL). **EQUILIBRIUM OF FORCES** Equilibrium of a system of concurrent forces, Conditions and types of Equilibrium, Lami's Theorem and its applications.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	**CENTRE OF GRAVITY** Difference between Centroid and Center of Gravity (CG), Centroid of standard plane figures and CG of simple solid bodies, Method of finding out Centroid of composite plane laminas and cut sections, Method of finding out CG of Composite solid bodies. **FRICTION** Concept and types of friction, Limiting Friction, coefficient of friction, angle of friction, angle of repose, Laws of friction (Static and Kinetic), Analysis of equilibrium of Bodies resting on Horizontal and inclined Plane, Utility / Nuisance value of friction.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	**SIMPLE LIFTING MECHINES** Concept of lifting Machines,Definition of Mechanical Advantage, Velocity Ratio and Efficiency of Machines and their relation, Reversibility of Machines and condition for self locking machine,Law of Machines, Maximum mechanical advantage and maximum efficiency of machine, Friction in machine (In terms of Load and effort), Calculation of M. A, V.R. and efficiency of following machines • Simple wheel and axle • Differential wheel and axle • Single purchase crab	Usage of ICT like PPT, Video Lectures, Black board.

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	• Double purchase crab • Simple screw jack • Different System of simple pulley blocks **MOTION OF A PARTICLE** Definition of speed, velocity, acceleration, uniform velocity, uniform acceleration and variable acceleration, Motion under constant acceleration/ retardation (equations of motion), Motion under force of gravity, Concept of relative velocity, Definition of projectile, velocity of projection , angle of projection, time of light, maximum height, horizontalrange and their determination, Definition of angular velocity, angular acceleration and angular displacement, Relation between linear and angular velocity of a particle moving in a circular path, Motion of rotation under constant angular acceleration.	
Unit – V	**LAWS OF MOTION** Newton's Laws of motion and their applications. **WORK, POWER AND ENERGY** Definition unit and graphical representation of work, Definition and unit of power and types of engine power and efficiency of an engine, Definition and concept of Impulse, Definition, unit and types of energies, Total energy of a body falling under gravity.	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:Through this syllabus the diploma student will learn the basic concepts of counting principle through permutation and combination , expansion of a binomial function , breaking up a complex fraction into simpler partial fractions, trigonometric ratio and concept of matrix

TEXT BOOKS:

- Applied Mechanics, R.S. Khurmi, S.C. Chand &Co. , New Delhi
- Applied Mechanics, I.B. Prasad Khanna Publishers, New Delhi
- Applied Mechanics, R.S. Jog, Anand Publishers, Gwalior
- Applied Mechanics, A.R. Page, Deepak Prakashan, Gwalior

REFERENCE BOOKS:

- Applied mechanics, R K Rajput S Chand publication
- Engineering Mechanics, R K Bansal, Pearson
- Applied mechanics, Henry Taylor Bovey, Nabu

job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Design engineer	Able to provide forces, directions skills	Goal 04(Quality education)	Simple wheel and axle • Differential wheel and axle • Single purchase crab • Double purchase crab • Simple screw jack • Different System of simple pulley blocks Work,power and Energy Newtons Laws of motion and their applications.

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SEMESTER- 1st
Course: Diploma CSE
SUBJECT:Physics

Subject Code: 2TDDE 103
Theory Max. Marks: 50
Theory Min. Marks: 17

Course objective:

The development of various diploma engineering topics is primarily based on the fundamental principles. The different principles of physics have a wide range of applications in all the branches of engineering. A reasonably good level of knowledge of physics, therefore, forms sound base for engineering students. Physics can be considered as a basic tool in the hands of an engineer through which he can pure his studies and research work in technical field. The foundation level of the subject acquired by the student is kept in mind for selection of the topics. To create interest in the students more stress is given on the applications, in engineering field

Unit	Unit wise course contents	Methodology Adopted
Unit – I	**UNITS & Measurement, Motion** Fundamental and derived units, Scalar and vector, Basic requirements to represent vector Symbols, abbreviation, and proculation Linear measurement by vernier calipers, screw gauge and spherometer Angular measurement by angular vernier Motion and its type Linear motion ,Circular motion ,Angular velocity and relation with linear velocity ,Centripetal acceleration, Centripetal and Centrifugal forces Rotatory motion Axis of rotation Moment of Inertia, Radius of gyration Kinetic energy of rotation Numerical problems and solution on the topic	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	**Molecular Phenomenon Solids, Liquids And Properties Of Matter** Postulates Of Molecular Kinetic Brownian motion Kinetic and Potential energy of Kinetic theory of gases Postulates Calculation of pressure by Kinetic theory Prove of different gases law by Kinetic theory, Elasticity: Meaning, definition, stress, stain, Hook's law and elastic limit Surface Tension: Meaning, definition, molecular forces, cohesive and adhesive forces, Surface energy, capillary rise and capillary rise method. Viscosity : Meaning, definition, stream line and turbulent flow, critical velocity, Stock's law. Numerical problems and solution on the topic.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	**Heat Heating Effect Of Current And Thermoelectricity** Heat and temperature, concept of heat as molecular motion Transmission of heat, study state and variable state. Concept of heat capacity, specific heat and latent heat. Calorimeter and its uses Thermodynamics Relation between heat and work Mechanical equivalent of heat First law of thermodynamics and its application, Second law of thermodynamics and its application ,Carnot cycle Numerical problems and solution on the topic., Heating effect of electric current: Joule's law, work energy and power in electric circuit, calculation of electric energy. Thermo electricity See back effect and thermoelectric power, Neutral temperature, temperature of inversion and relation between them Thermo electric thermometer and thermo couples. Numerical problems and solution	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	**Sound Optics And Optical Instruments** Reduction of sound waves(Longitudinal and transverse waves)Progressive and stationary waves Basic knowledge of refraction , reflection, interference and diffraction. Ultrasonic, Audible range, Production of ultrasonic, properties due Refraction, critical angle and total internal reflection, refraction through lenses and problems Power of lenses Spherical and chromatic aberrations Simple and compound microscope, telescopeand derivation for their magnifying power Numerical problems and solution on the topic.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – V	**Electrostatics and Electromagnetic Induction Modern Physics, Basic Electronics**	Usage of ICT like PPT, Video Lectures, Black board.

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	Coulomb's law, Electric field intensity, potential. Capacity, principle of capacitor, types of capacitor, combination of capacitors Electromagnetic Induction: Faraday's law, Lenz's law Self and mutual inductance Transformer and electric motor, Induction coil Photoelectric effect, threshold frequency, Einstein- equation, Photo electric cells Radioactivity : decay constant, Half life, mean life Properties of nucleus, nuclear mass, mass defect Production of x-rays, properties and its uses Thermal emission, semiconductors, Types of semiconductors Explanation of conductor, semiconductor and insulators on the basis of band theory P-N junction, diode as rectifier	

List of Experiments:

- Refractive index of prism (I-D) curve
- Refractive index of prism (spectrometer)
- Focal length of a convex lens by u-v method
- Focal length of a convex lens by displacement method
- Verification of Ohm's law
- To find out unknown resistance by meter brid
- To find out internal radius of hollow tube by vernier calipers.
- To find out volume of given cylinder by screw gauge.
- Surface tension by Capillary rise method. Coefficient of viscosity
- Coefficient of Thermal conductivity by searl's method.
- Verification of Newton's cooling law.

Course outcomes:

- The course content should be taught and implemented with the aim to develop different types of skills leading to the achievement of the following competencies *Select proper measuring instrument on the basis of range, least count & precision required for measurement.
- Analyze properties of material & their use for the selection of material mostly applicable for engineering users.
- Identify good & bad conductors of heat and proper temperature scale for temperature measurement Identify.
- Analyze, discriminate and interpret logical sequence of field problems with the study of physics.
- Analyze variation of sound intensity with respect to distance and follow the principles used in the physical properties, its measurement and selections.

TEXT BOOKS:

- Applied Physics Vol. 1 & 2, Saxena and Prabhakar, S Chand
- Physics, Halliday And Resnic R Wiley
- Engineering Physics, Gaur And Gupta, Dhanpat rai

REFERENCE BOOKS:

- Engineering Physics, B K Pandey, Cengage
- Applied PhysicsP K Diwan, Wiley

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Scientist and Academician ,working professionals	Able to provide vectors ,forces , direction skills	Goal 04(Quality education)	Joule's law, work energy and power in electric circuit,

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SEMESTER- 1st **Subject Code: 2TDDE 104**
Course: Diploma CSE **Theory Max. Marks: 50**
SUBJECT:Environmental Engineering & Safety **Theory Min. Marks: 17**

Course objective:

- To improve the quality of life of the local community through management and conservation of natural resources.
- To ensure that the natural environment is used wisely as well as judiciously. The natural resources are continuously available for the benefit and enjoyment of future generations.
- To decrease vulnerability and improve adaptation capacity among poor local communities associated with Climate Change.

Unit	Unit wise course contents	Methodology Adopted
Unit – I	**Introduction to Environment** The Biosphere, biotic and abiotic, An aquatic ecosystem, Types of pollution Impact of hum a being on environment, Impact of environment on human being, Basic approach to improve environmental qualities, Roll of an environmental engineer	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	**Air Pollution Sources and Effects** Standard definition of air pollution, Composition of natural air, Names of air pollutants, Classification of air pollutants, primary and secondary pollutants, Classification of source of air pollutants on different bases, Definition of different types of aerosols, Effect of air pollution on: human health, material properties, vegetation, Major toxic metals and their effects, Major environmental phenomenon e.g., acid rain, global warming, green house effect, ozone layer depletion, Air quality standards, Brief description of air pollution laws.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	**Meteorological Aspects of Air Pollutant Dispersion** Meteorological parameters influencing air pollution, Environmental laps rate, temperature inversion, atmospheric stability and adiabatic loss rate, Turbulence, topographical effects, Plume behavior, looping, coning, fanning fumigation, lofting , trapping. **Air Pollution Control Methods and Equipments** Natural purification processes of air, Artificial purification methods of air, Brief description of following control equipments along with sketch e.g, gravitation settling chamber, cyclone, scrubber, bag house filter, electrostatic precipitator, Brief description of following processes for the control of gaseous pollutants e. g., absorption, adsorption, condensation, combustion etc.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	**Water Pollution Sources and Classification** Water resources, Uses of water, Classification of water, Origin, composition and characteristics of domestic waste water as well as industrial waste water, Biochemical oxygen demand, Water pollution laws and standards, Uses of waste water, Classification of waste water, Chemical oxygen demand **Waste water treatment method** basic processes of water treatment, Meaning of primary, secondary and tertiary treatment, Flow chart of a simple effluent treatment plant, Theory of industrial waste treatment, Volume reduction, neutralization and proportion	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	**Solid Waste Management** Sources and classification of solid waste, Public health aspects, Disposal methods - open dumping, sanitary, land fill, Incineration, compositing, Potential methods of disposal, Recovery and recycling of paper, glass, metal and plastic **Noise Pollution and Control** Sources of noise pollution, Units of Noise pollution measurement, Allowable limits for different areas, Problems of noise pollution and measures to control it, Noise pollution control devices brief discussion	Usage of ICT like PPT, Video Lectures, Black board.

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	Safety Practices Responsibility of employees and employers regarding health and safety, Fire hazards prevention and precautions, Industrial hazards prevention and protection, Protection from air and noise pollution	

Course outcomes:

- After successful completion of this course students will able to
- Enhance the use of recycled material for construction work and optimize the use of conventional energy sources.
- Take care of issues related to Conservation & Hazard Management while working as chemical engineer.
- Assess the effects of pollution on resources.
- Justify need of renewable energy for sustainable development.
- Identify concept of waste management and methods of recycling.
- Prepare list of use of do's and don'ts applicable during disasters.

TEXT BOOKS:

- Environmental pollution control Engineering, C. S. Rao, PHI
- Air pollution and control, Seth, S Chand
- Air pollution, M.NRao, TMH

REFERENCE BOOKS:

- A Textbook of environmental studies, Dr D K Asthana, S Chand
- Fundamentals of air pollution engineering, Richard C. Flagan John H. Seinfeld Prentice Hall
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Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Safety officers Forest guard Forest ranger	Able to provide to clean and green ecosystem and environmental protection skills	Goal 04(Quality education)	

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SEMESTER- 1st
Course: Diploma CSE
SUBJECT:Communication Skill-I

Subject Code: 2TDDE105
Theory Max. Marks: 50
Theory Min. Marks:17

Course objective:

- The main aim of communicating is to pass information so that other people may know about what you are talking off. This can be through facts or even feelings.

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Sentences –simple compound ,complex Articles –usage of 'A' , 'AN', 'THE' Preposition—position of prepositions ,place Relations Time Relations **Tenses** – past perfect ,present perfect progressive ,past perfect Progressive, simple present and present progressive	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	Modals , Antonyms ,synonyms ,one word substitution ,jumbled sentences, Idioms and phrases ,correction of sentences with words likely to be confused word formation like prefix and suffix	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	Comprehension of unseen passage short answer type questions to test understanding of the passage	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	Précis –writing -Introductory Remarks, Method of procedure, Summing up	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	Essay-writing -- Introductory Remarks, Characteristics of a good Essay, Classifications of Essays, Method of collecting materials	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:

- Through this syllabus the diploma students will learn the basic concept of English. Student should gain the ability to read understand, analyze, intercept and extrapolate from the complex texts that are at the heart of the diver's traditions of the English language.

TEXT BOOKS:

- English Conversation Practice, Grant Taylor, TMH
- Communication Skills, Somaiya, M/S Somaiya Publication, Bombay
- English Grammar, Usage, and Composition, Tickoo& Subramanian,S. Chand

REFERENCE BOOKS:

- Communication for Engineers, P. PrasadKataria and sons publications, New Delhi
- Effective Business Communication, M.V. Rodriques, Concept Pub. Co., New Delhi
- Essentials of Business Communication, Dr. Rajendra Pal & J.S. Korlahalli, S.Chand& Sons, New Delhi.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
	Able to provide speak English	Goal 04(Quality education)	

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SEMESTER- 2nd **Subject Code: 2TDDE201**
Course: Diploma CSE **Theory Max. Marks: 50**
SUBJECT:Mathematics-II **Theory Min. Marks: 17**

Course objective:

- The main of teaching mathematics is to provide students with an adequate knowledge on the subject to serve as a tool in the learning of various engineering subjects and to solve technical problems encountered during the course of study. It can also serve as a foundation for their future work involving computation.

Unit	Unit wise course contents	Methodology Adopted
Unit – I	**CO-ORDINATE 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 Straight lines, Parallel and perpendicular Straight lines. Standard and general equation of Straight line. Point of intersection of two straight lines .	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	**STATISTICS** Measures of Central tendency (Mean, Mode, Median),Measures of Dispersion (Mean deviation, standard deviation)	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	**DIFFERENTIAL CALCULUS** Define constant, variable, function, Value of the function, Concept of limit of a function, Definition and concept of differential coefficient as a limit, Standard results, Derivatives of sum, difference, product, quotient of two functions, Differential co-efficient of function of a function, Differential co-efficient of implicit function, Logarithmic Differentiation, Differential coefficient of Parametric function.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	**INTEGRAL CALCULUS** Definition as a inverse process of differentiation, Standard Results (including inverse function), Methods of Integration: Substitution, Integration by parts, Breaking up into partial fraction, Concept of Definite Integral	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	**VECTOR ALGEBRA** Concept of Vector and Scalar Quantities, Different types of vectors. Addition and subtraction of vectors, Components of a vector Multiplication of two vectors: Scalar Product, Vector Product, Applications (Work done, power & reactive power)	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:

- Here in this syllabus student will learn some concept of co-ordinate geometry , some part of statistics viz. mean , median , mode , deviation etc. , and of course a brand new concept of differential calculus and integral calculus which play an important role in technical subjects then concept of vector number , how they are added subtracted and multiplied etc.

TEXT BOOKS:

- Higher Engineering Mathematics, B.S. Grewal, Khanna publisher
- Mathematical Statistics, Ray and Sharma, Ram Prasad publication
- Differential Calculus, Gorakh Prasad, Pothishala publication

REFERENCE BOOKS:

- Mathematics for Polytechnics, Navjyotidutta, T.T.T.I. Bhopal
- Engineering Mathematics, Dr. S.K. Chouksey, Khanna publisher
- Integral Calculus, Gorakh Prasad, TMH

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Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Mathematician	Able to provide knowledge of numerical ability and apptitude skills	Goal 04(Quality education)	

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SEMESTER- 2nd **Subject Code: 2TDDE202**
Course: Diploma CSE **Theory Max. Marks: 50**
SUBJECT:Engineering Graphics **Theory Min. Marks: 17**

Course objective:

- To familiarize with the construction of geometrical figures.
- To familiarize with the projection of 1D, 2D and 3D elements.
- To familiarize with the sectioning of solids and development of surfaces.
- To familiarize with the Preparation and interpretation of building drawing.

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction to Drawing Instruments: Introduction of drawing instruments, materials and their uses, Applications of mini-drafter, Applications of compass and divider, Applications of French curves and spline, Pencils grades and their uses Designation and sizes of drawing sheet and drawing board, Planning and Layout of Drawing Sheet: Planning of drawing sheet as per I. S.: 696-1972 (SP 46: 1988) This should include: Margin, Title Block, Zoning, Revision panel, Folding marks, Numbering of sheet.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	**CONVENTIONAL REPRESENTATION:** Conventional representation of the following as per BIS practice **COMMON ENGINEERING MATERIALS ELECTRICAL INSTALLATIONS AND FITTINGS** Main switches, (lighting and power), socket outlets (3 pin 5AMP, 3pini5 AMP), bell, buzzer, loud speaker, Aerial, ceiling fan, exhaust fan, Bracket fan, fan regulator, battery and earth point. **ELECTRONICS COMPONENTS** Diode: Zener, varactor, Scotty, step recovery, light emitting diode (LED), PNP and NPN transistors, resistance, capacitor, Inductors (fixed and variable both), IC (8pin and 14pin) SCR, TRIAC, DIAC, UJT, FET, MOSFET, LOGIC GATES **SANITARY FITTINGS** showerhead, wall lavatory basin, comer Lavatory basin, urinal stall, kitchen sink, Indian type WC,Water closets (Asian pan, urissapan, Anglo-Indian, European) **BUILDING** Single and double swing doors and windows. **MECHANICAL COMPONENTS** Internal and external threads, slotted head, Square end and flat, radial arms and ribs, serrated shaft, splined shaft, Chain wheel, bearing, straight and diamond knurling, Compression and tension spring, leaf spring (with and without eye), Spur and helical gear	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	**LINES, LETTERING AND DIMENSIONING:** Introduction of type of lines and their applications, Single stroke vertical, inclined letters (capital and lowercase) And numerals, Dimensioning: Elements of dimensioning- dimension line, extension line, arrowhead and leader line, Dimensioning system - Aligned and unidirectional, Dimensioning of Arcs and Circles, Angular Dimensioning, Dimension of counter sunk and counter bore. **METRICAL CONSTRUCTIONS AND ENGINEERING CURVES:** Divide a line into any number of equal parts by parallel line method bisecting of line and angle. Construction of triangles and polygons Introduction of conic sections (curves), Construction of Ellipse by Eccentricity and Concentric circles methods, Construction of Parabola by Eccentricity and Rectangle methods Construction of Hyperbola by Eccentricity method Construction of Cycloid, Construction of Involutes of circle and polygon, Construction of Archimedean Spiral of any number of convolutions	Usage of ICT like PPT, Video Lectures, Black board.

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Unit – IV	**SCALES:** Introduction of scales and their applications, Concept of reducing, enlarging and full size scale, Classification of scales - plain, diagonal, Vernier, Scale of chord and comparative scales, Definition of R.F, Construction of plain and diagonal scales **ORY OF PROJECTION AND PROJECTION OF POINTS, LINES AND PLANES** Definition of various term associated with theory of projection- Planes of projection, Quadrants, first & third angle projection method, Projection of points in all the four quadrants. Projection of lines- Parallel to HP and VP both. 1.Perpendicular to one plane and parallel to other. 2.Inclined to one plane and parallel to other. 3.Knowledge of projection of line inclined to both the planes Projection of planes - 1.Perpendicular to HP and VP both 2.Perpendicular to one plane and parallel to other 3.Inclined to one plane and perpendicular to other. 4.Knowledge of projection of plane inclined to both the planes **PROJECTIONS OF SOLIDS:** Projection of cylinder, cone, prism and pyramid. Under the following conditions: 1. Axis parallel to HP and VP 2. Axis perpendicular to HP and parallel to VP 3. Axis perpendicular to VP and parallel to HP 4. Axis inclined to HP and parallel to VP. 5. Axis inclined to VP and parallel to HP. 6. Axis inclined to both HP and VP	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	**SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES:** Section of cone, cylinder, prism and pyramid (Solid resting on its base in the HP i.e. the Axis perpendicular to HP and parallel to VP) in the following cases: 1. Section plane parallel to HP and perpendicular to VP 2. Section plane parallel to VP and perpendicular to HP. 3. Section plane inclined to HP and perpendicular to VP. 4. Section plane inclined to VP and perpendicular to HP. Drawing True shape of section. Introduction to development of lateral surface of solids- Cone, Cylinder, Prism and Pyramids (Simple and truncated), Under the condition - solid resting on its base in the HP and axis, Perpendicular to HP and parallel to VP Development of funnel and elbow **1.INTERSECTION OF SURFACES** Intersection of following cases – Cylinder to cylinder and Prism to prism(With their axis intersecting and perpendicular to each other.) **2.ORTHOGRAPHIC PROJECTIONS & FREE HAND SKETCHING:** Principles of orthographic projections, Identification of necessary views and superfluous view, Selection of front view, Preparation of necessary orthographic views of simple objects From given pictorial views •Dimensioning of orthographic views as per standard practice. •Free hand sketches of simple objects (Using Pencil, Eraser & Paper only)	Usage of ICT like PPT, Video Lectures, Black board.

	3.ISOMETRIC VIEWS •Concept of isometric projection and isometric view (Isometric Drawing) •Construction of isometric scale •Construction of isometric view of polygon and circle •Construction of isometric view of cone, cylinder, prism and pyramids •Construction of isometric view of simple objects From given orthographic views	

Course outcomes:

- Introduction to engineering design and its place in society
- Exposure to the visual aspects of engineering design
- Exposure to engineering graphics standards
- Exposure to solid modelling
- Exposure to creating working drawings
- Ability to draw projections and analysing multiple views of object.

TEXT BOOKS:

- Engineering Drawing, N.D. Bhatt, Pearson
- Engineering Drawing, R.K. Dhawan, S.Chand
- Engineering Drawing, P. S.Gill, S.Chand

REFERENCE BOOKS:

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Design Engineer draftsman Planning Engineer	Able to provide technical drawing skills	Goal 04(Quality education)	Knowledge of projection of line inclined to both the planes

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SEMESTER- 2nd **Subject Code: 2TDDE203**
Course: Diploma CSE **Theory Max. Marks:50**
SUBJECT:Chemistry **Theory Min. Marks: 17**

Course objective:

- The objective of the Chemistry in polytechnique courses is to acquaint the students with the basic phenomenon/ concepts of chemistry, the student face during course of their studying the industry. The student with the knowledge of the basic chemistry will understand and explain scientifically the various chemistry related problems in the industry/engineering field. The student will able to understand the new developments and break through sufficient lying engineering and technology.
- To appreciate the need and importance of chemistry for industrial and domestic use.
- To gain the knowledge on existing and future upcoming materials used in device fabrication.
- To impart basic knowledge related to material selection and the techniques for material analysis.
- To impart knowledge of green chemical technology and its applications.
- Demonstrate knowledge of science behind common impurities in water and methods to treat them.
- Knowledge of methods to determine the calorific value of fuels.
- Apply the science for understanding corrosion and its prevention.

Unit	Unit wise course contents	Methodology Adopted
Unit – I	**ATOMIC STRUCTURE AND RADIO ACTIVITY** Discovery of electron, proton ,neutron and nucleus. Ruther ford's and Bohr's model of an atom. Bohr Burry scheme of filling the electrons in various orbits. Idea of s,p,d,f orbital .Alfa, Gamma and Beta rays, theory of radio activity, Group displacement law, half life period, numerical problems on half life period, fission and fusion. **SURFACE CHEMISTRY AND ITS APPLICATION** True solution, colloidal solution and suspension, lyophobic and lyophillic colloids, optical and electrical properties of colloids, coagulation, coagulants, idea about gels and emulsions. **ELECTROCHEMISTRY** Electrolysis, Faraday's laws of electrolysis, Numerical problems on Faradays Law, electroplating of copper and nickel.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	**COLLIGATIVE PRPOPERTIES** Osmosis & osmatic pressure, Relative vapour pressure and Routls law. Internal energy (enthalpy) Entrophy, Entrophy fusion free energy, Effect of change in temperature catalysis. **CHEMICAL BONDING AND CATALYSIS** (A) Bonding: Nature of bonds- Electro valent, Co-valent, co-ordinate and hydrogen bond. (B) Catalysis: Types, theory characteristic, positive, negative, auto and induced catalyst. Catalytic Promoter, and catalytic inhibitors. Industrial Application of catalysis. **WATER:** Sources of water, types of water, hardness of water, its causes, types and removal, Boiler feed water, harmful - effects of hard water in boiler. Municipal water supply. Numerical on soda lime process. Determination of hardness of water by O. Hener's, EDTA and soap solution method.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	**METALS AND ALLOYS:** Physical and chemical properties of metals, copper, iron, aluminum, tin, nickel. General principal of metallurgy, minerals/ ores, ore dressing, roasting ,smelting, bassemerisation, fluxes, purification. Explanation of alloying purposes, methods of alloying, composition and uses of alloy like brass, bronze, duralium, German silver, gun metal, solder, stainless steel, casting and bearing alloy. **IONIZATION, PH VALUE CORROSION AND PROTECTION:** Arhenius theory of ionization, factors affecting ionization. pH meaning (numerical), Buffer solutions and Buffer actions, choice of indication (acidimetry and alkalimetry). Explanation of corrosion, types of corrosion, factors effecting corrosion, corrosion control (protection against	Usage of ICT like PPT, Video Lectures, Black board.

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	corrosion), metal and organic coating for corrosion control. **GLASS, CEMENT AND REFRACTORY:** Glass: Basic raw materials for glass, composition and manufacture of glass, varieties of glass and annealing of glass,. Cement : Constituting compounds in cement, Composition of Portland Cement, its manufacture, setting and hardening of cement. Refractories : Meaning, characteristics , use of common refractory materials.	
Unit – IV	**HIGH POLYMERS, RUBBER AND INSULATORS:** Polymerization and condensation, classification of plastics, Compounding and Moulding constituents of plastics. Preparation Properties and uses of PVC, polyethene, polystyrene, polyamides, polyesters , Bakelite. Synthetic fibers - nylon, rayon, decron, and polyesters. Definition characteristics , classification and properties of insulators. Glass, wool and thermo cole. Idea about rubber and vulcanization. **LUBRICANTS, PAINTS AND VARNISHES:** Lubricants: Meaning , type and theory of lubricants, properties of a good lubricants, Flash and fire point and cloud point, emulsification number, viscosity. Paints and Varnishes : Meaning, ingredients and characteristics of good paints and varnishes, their engineering applications.	Usage of ICT like PPT, Video Lectures, Black board.
Unit – V	**FUELS, FIRE EXTINGUISHERS AND EXPLOSIVES:** Classification of fuel, gross and net calorific value, Determination of a solid fuel by bomb calorimeter, octane and octane number. Proximate analysis of fuel, its utility, crude petroleum, products of fractional distillation . Fire extinguishers - Description and use. Explosives - Meaning, types, characteristic and use of explosives. Name Dynamite, lead azide, T.N.T., Picric acid, R.D.X. **POLLUTION AND CONTROL:** Introduction and chemical toxicology, air and water pollution, control of air and water pollution. Harmful effect of different gases like carbon mono-oxide, carbon dioxide, sulphur dioxide, nitric oxide, nitrous and lead.	Usage of ICT like PPT, Video Lectures, Black board.

List of Experiments:

- To identify one Anion and Cation in a given sample.
- Determination of flesh point and fire point of a given sample of oil by Abel's apparatus.
- Determination of viscosity by Red Wood Viscometer no. 1 and no. 2.
- RedoximetryTitration :
- Percentage of Iron in given sample of alloy.
- Determination of strength of ferrous ammonium sulphate.
- Determination of strength of anhydrous ferrous sulphate and ferrous sulphate.
- Determination of hardness of water by :
  (a) EDTA Method and Soap Solution Method
- Determination of solid content in the given sample of water.
- Determination of percentage of moisture in the given sample of coal by proximate analysis.

Course outcomes:

After the completion of the course, the learner will be able to:

- Analyze the need, design and perform a set of experiments.
- Differentiate hard and soft water, solve the related numerical problems on water purification and its significance in industry and daily life.
- Apply the principles of green chemistry in designing alternative reaction methodologies to minimize hazards and environmental degradation.
- Understand the causes of corrosion, its consequences and methods to minimize corrosion to improve industrial designs.

- Explain the properties, separation techniques of natural gas and crude oil along with potential applications and role of petrochemicals in national economy.
- Equipped with basic knowledge of polymers and its application.

TEXT BOOKS:

- Physical Chemistry, Bahl and Tuli, TMH
- Inorganic Chemistry, Satyaprakash, S Chand
- Engineering Chemistry, Rao ,Pearson

REFERENCE BOOKS:

- Applied Chemistry, H.N. Sahni, Deepak Prakash
- Polymer Chemistry, O.P. Mishra, Khanna publisher
- Applied Chemistry, Shrivastava & Singhal, Pbs Publication, Bhopal.

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
	Able to provide lubricant ,fuels and their treatment skills	Goal 04(Quality education)	

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SEMESTER- 2nd **Subject Code: 2TDDE204**
Course: Diploma CSE **Theory Max. Marks: 50**
SUBJECT:Fundamentals Computer & IT **Theory Min. Marks: 17**

Course objective:

- Learn basic principles of using Windows operation system.
- Learn and practice basic keyboarding and mouse use.
- Be able to access the Internet, Worldwide Web, as well as use Internet directories and search engines, and locate www addresses.
- Be able to find and evaluate information on the Web(learn how to be critical and evaluate what is valid and reliable).
- Learn basic computer and keyboarding related vocabulary in English.
- Learn the basics of e-mail, such as sending, forwarding and receiving mail,attaching documents, creating mailboxes, filters, and address books.
- Learn basic word processing skills with Microsoft Word,such as text input and formatting, editing, cut, copy and paste,spell check, margin and tab controls, keyboard shortcuts, printing,as well as how to include some graphics such as pictures and charts.
- In general, develop an intuitive sense of how computers workand how they can be used to make your academic work more efficient.

Unit	Unit wise course contents	Methodology Adopted
Unit – I	**Computer Organization, Evolution And Generation Of Computer Systems:** Block Diagram of computer system: Central Processing Unit, Memory unit ,ALU, Control unit Input & Output devices. Input DeviceCategorizing input hardware :Key Board, Card readers, Scanning Devices ,Bar Code Readers, OCR, OMR, MICR, Pointing Device, Mouse and its types ,light pen Touch Devices, Web camera ,microphone Joystick, Digitizing tablet. Output Device printers, Dot matrix, Printers, Plotters, and Monitors: CRT, TFT, Plasma, LCD Projector, DLP Projector, Speaker. Computer System Characteristics and capabilities Memory Capabilities, Repeatability Types of Computers & its Application Analog, Digital & Hybrid, General & Special Purpose Computer, Application of computer system Computer Generations & Classification of Computer Systems Minis, Mainframes & Super Computer Evolution of micro Comparative study w.r.t. speed, data bus, controllers, memory, peripheral interface of PC to Pentium computer systems. Decimal, Binary, Octal, Hexadecimal number	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	**Number System, Codes & Data Representation, Storage Devices** Systems Inter-Conversion from decimal to binary, octal, hexadecimal, conversion of binary number System to decimal, hexadecimal. Codes used for information exchange between computers–ASCII, Unicode, Data representation- Bit, Nibble, Byte, Kilo Byte, Mega Byte, Giga Byte, Tera Byte, Peta Byte etc Storage Fundamentals, Primary & Secondary Storage. RAM, dynamic and static ROM, PROM, EPROM, EEPROM, ape storage Devices, Characteristics & limitations, Floppy &theirtypes. Direct access Storage– Hard Disk, Disk Cartridges, Mass Storage Device Optical Disk , CD Rom, DVD, flash drive, ZIP drive	Usage of ICT like PPT, Video Lectures, Black board.

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Unit – III	**Computer Software's & Language** System Software V/s Application Software. Types of System Software, Operating System, Loader, Linker, Language Processor, Assembler, Compiler and Interpreter, Device Driver. CLASSIFICATION AND CHARACTERISTICS OF LANGUAGES Machine language, Assembly language, High-level language, Generations of Computer Language Application Software: working with MSOFFICE components, creating editing, formatting and printing documents using MSWORD, Data analysis and charting with MSEXCEL, Creating and presenting slide show using MS POWERPOINT	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	**Concept of Operating System, System security** Introduction, Functions of operating system, Types –batch, single user, multiuser, multiprogramming, multitasking, multi threading, real-time , embedded, Network, Distributed CLI(Command Line Interface) and GUI modes of O.S. Booting Process, BIOS, POST, Boot Strap Loader Introduction to viruses, worms, Trojans, Anti Viruses scanning & Removal of Viruses ,safety measures- Firewall, updates, Patches	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	**Internet Applications:** Introduction to internet, different services of internet- www, E-Mail, Chat (Textual/Voice), website access and information search, Browsers And Search Engines	Usage of ICT like PPT, Video Lectures, Black board.

List of Experiments:

1 .Study the uses of input and output device
2. Study the uses of storage devices
3. Backup of data on tape, floppy & hard disk, CD, DVD and in PEN drive
4. Use of windows media player, recording, editing playing sound and video files
5. PRACTICE ON WINDOWS 2000/ XP/Vista

Starting Windows, Exploring the desktop, Arranging windows, my Creating Shortcuts, Practice on moving and Practice on Windows Explorer File organization: creating, copying, moving, renaming and deleting and Practice on Windows Accessories Creating editing, formatting, previewing and printing documents using Shutting down windows.

6. PRACTICE ON MICROSOFT EXCEL

Creating editing, formatting, saving, previewing and printing worksheet.
Use of formula and functions.
Split windows and freeze pans.
Create, edit, modify, print worksheet/charts.
Import & Export D
Pivot table- create, modify
Sorting & Filter data
Header, footer, Watermark.

7. PRACTICE ON POWERPOINT

Create, edit, insert, move, slides.
Open and save presentation.
Insert Object, picture, Diagram, chart, Table, Movie & Sound,
Slide design, layout, background.
slide show, setup, action button, animation scheme, custom animation,

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Course outcomes:

- Demonstrate a basic understanding of computer hardware and software.
- Demonstrate problem-solving skills.
- Apply logical skills to programming in a variety of languages.
- Utilize web technologies.
- Demonstrate basic understanding of network principles.
- Working effectively in teams.
- Apply the skills that are the focus of this program to business scenarios.

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TEXT BOOKS:

- A First Course in Computers S . Jaiswal Golgotha Publication
- Computers Today Suresh K. Basandra Galgotia Publication
- Understanding windows Chapman BPB Publication

REFERENCE BOOKS:

- The Complete Guide to Microsoft Office Professional, Ron Mansfield,Sybex /BPB Asian Edition
- Inside IBM PC., Norton Peter, TMH
- Multimedia Making it work, Tay Vaughan,TataMcGrawHill

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
Software and hardware engineer	Able to provide software skills and computer proficiency	Goal 04(Quality education)	

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SEMESTER- 2nd
Course: Diploma CSE
SUBJECT:Communication Skills-II

Subject Code: 2TDDE205
Theory Max. Marks: 50
Theory Min. Marks: 17

Course objective:

- The students, after completing the course ,will be able to use general purpose words of English to express himself in speaking reasonably clearly and correctly on routine matters .Develop a habit of reading with comprehension to achieve an optimum speed of 75 wpm Write reasonably and grammatically correct English

ENABLING OBJECTIVES:

- The students, after completing the course, will be able to
- Understand slowly delivered spoken material in Indian English.
- Understand general purpose words of English.
- Use general purpose words of English to express himself in speaking reasonably clearly and correctly on routine matters.
- Write reasonably and grammatically correct English.
- Develop a habit of reading with comprehension to achieve an optimum speed of 75 WPM.
- Communicate effectively in a professional environment through speaking and writing to achieve desired objectives.

Unit	Unit wise course contents	Methodology Adopted
Unit – I	**Nature, process and importance of communication** Meaning of communication, Definition of communication, Functions and importance of communication, Process of communication	Usage of ICT like PPT, Video Lectures, Black board.
Unit – II	**Detailed study of the stories from the prescribed book** Writing summary, moral and characterization of any one story from the book prescribed	Usage of ICT like PPT, Video Lectures, Black board.
Unit – III	**Letter writing** Importance of letter writing, Lay out of business letter, Format of business letter, Letters of complaint /claim	Usage of ICT like PPT, Video Lectures, Black board.
Unit – IV	**Passages of comprehension** Steps for effective Reading, Meaning of comprehension	Usage of ICT like PPT, Video Lectures, Black board.
Unit - V	**Composition and Translation** writing paragraphs of 150 words on topics of general interest, Translation (Hindi to English and vice-versa)	Usage of ICT like PPT, Video Lectures, Black board.

Course outcomes:

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- Seeks to develop the students' abilities in grammar, oral skills, reading, writing and study skills. students should improve their speaking ability in English both in terms of fluency and comprehensibility

TEXT BOOKS:

• English Conversation Practice	Grant Taylor	
• Communication skills		M/S Somaiya Publication, Bombay
• English Grammar, Usage, and Composition	Tickoo& Subramanian,	S. Chand

REFERENCE BOOKS:

• Communication for Business	Shirely Taylor	Longman, England.
• Effective Business Communication	M.V. Rodriques	Concept Pub. Co., New Delhi.
• Essentials of Business Communication	Dr. Rajendra Pal & J.S. Korlahalli	S.Chand& Sons, New Delhi

Job Opportunities	Employability Skill developed	UNDP Goal Achieved	Entrepreneurship Opportunity
	Able to provide Speaking skills	Goal 04(Quality education)	

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SEMESTER- 3rd
Course: Diploma CSE
SUBJECT: Database management System

Subject Code: 2TDCS-301
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

- To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
- To understand and use data manipulation language to query, update, and manage a database
- To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency,
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Database Systems; Database and its purpose, Characteristics of the database approach, Advantages and disadvantages of database systems. Classification of DBMS, Database Administrators, Introduction to SQL, DDL, DML.	ICT based class room teaching, Group Presentations, White board
Unit – II	Database System Concepts and Architecture:-Data models, schemas, instances, data base state. DBMS Architecture; The External level, The conceptual level, The internal level, Mappings. Data Independence; Logical data Independence, Physical data Independence. Database Languages and Interfaces; DBMS Language, DBMS Interfaces.	ICT based class room teaching, Individual Presentation, White board
Unit – III	Data Modeling using E.R. Model (Entity Relationship Model) :-Data Models Classification; File based or primitive models, traditional data models, semantic data models. Entities and Attributes, Entity types and Entity sets, Key attribute and domain of attributes, Relationship among entities.	ICT based class room teaching, Group Discussions, White board
Unit – IV	Relational Model:- Relational Model Concepts: Domain, Attributes, Tuples and Relations. Relational constraints and relational database schemes; Domain constraints, Key constraints andconstraints on Null. Relational databases and relational database schemes, Entity integrity, referential integrity and foreign key.	ICT based class room teaching, White board
Unit - V	Normalization:-Non-loss decomposition and functional dependencies, First, Second and Third normal forms, Boyce/Codd normal form, Joining concepts, Transaction control, Locking techniques.	ICT based class room teaching, Group Presentation, White board

LIST OF PRACTICALS:

The program to be implemented using SQL:

1. Create the Database & Table using SQL.
2. Entering the values in Database using insert & delete option.
3. WAP for joining (left,right,equivalent).
4. Create a table using primary , Candidate & foreign keys.
5. Implementation of connectivity of front end to back end.
6. Implement Aggregate function.
7. Searching a content in a table.
8. Creating table from another table.
9. Inserting data into a table from another table.
10. Alter, and update operations.

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11. Grouping data, aggregate functions 12.

Course Outcomes:

1. Define program-data independence, data models fordatabase systems, database schema and database instances.
2. Recall Relational Algebra concepts, and use it to translate queries to Relational Algebra statements and vice versa.
3. Identify Structure Query Language statements used in creation and manipulation of Database
4. Identify the methodology of conceptual modeling through Entity Relationship model.
5. Identify the methodology of logical model.
6. Identify the methodology of physical model.
7. Develop an understanding of the differences between OODBMS, ORDBMS and RDBMS and the practical implications of each approach.
8. Analyze and design a real database application.

Text Book:

- Database Management System by Seema Keaar "Pune Technical Publication"2011
- Database Management System Oracle SQL and PL/SQL by Pranab Kumar Das Gupta & P. Radha Krishna 2nd. "New Delhi PHI Learning"
- Database Management Systems by Alexis Leon & Mathews Leon"Chennai :Leon Vikas

Reference Books:

- Database Management Systems (McGraw-Hill International Editions: Computer Science Series) Paperback – Import, Dec 1999 by Raghu Ramakrishnan (Author), Johannes Gehrke (Author, Editor)
- An Introduction to Database Systems, 8e Paperback – 2006 by Date (Author)
- Database Management System Oracle SQL and PL/SQL by Pranab Kumar Das Gupta &

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Software Developers DBA Teaching Scientist Analyst	Able to understand and use data manipulation language to query, update, and manage a database. Able to design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.	Goal 04(Quality education) Goal 09 (Financial growth Innovative)	Service consultancy. Freelancing.

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SEMESTER- 3rd
Course: Diploma CSE
SUBJECT: Programming with C

Subject Code:2TDCS-302
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

- To impart adequate knowledge on the need of programming languages and problem solving techniques.
- To develop programming skills using the fundamentals and basics of C Language.
- To enable effective usage of arrays, structures, functions, pointers and to implement the memory management concepts.
- To teach the issues in file organization and the usage of file systems

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	ELEMENTS OF C LANGUAGE Algorithm and Programming Development steps in development of a program, Flow charts, Algorithm development, Program Debugging. Program Structure:-I/o statements, assign statements. Constants, variables and data types, Operators and Expressions, Standards and Formatted, Use of Header & Library files.	ICT based class room teaching, Group Presentations, White board
Unit – II	CONTROL STRUCTURES Introduction, Decision making with IF – statement, IF – Else and Nested IF, While and do-while, for loop, Break and switch statements. Functions:- Introduction to functions, Global and Local Variables, Function Declaration, Standard functions, Parameters and Parameter Passing, Call – by value/reference, Recursion.	ICT based class room teaching, Individual Presentation, White board
Unit – III	INTRODUCTION TO ARRAYS Array Declaration and Initialization, Single and Multidimensional Array.Arrays of Characters.	ICT based class room teaching, Group Discussions, White board
Unit – IV	POINTERS Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers.Structures and Unions:-Declaration of structures, Accessing structure members, Structure Initialization, Unions.	ICT based class room teaching, White board
Unit - V	STRINGS Introduction, Declaring and Initializing string variables, Reading and writing strings, Stringhandling functions, Array of strings Files:-Introduction, File reading/writing in different modes, File manipulation using standard functiontypes.	ICT based class room teaching, Group Presentation, White board

LIST OF PRACTICALS:

1. Write a Program (WAP) to calculate temperature in Fahrenheit to Celsius using formula C= (F-32)/1.8.
2. WAP to calculate Sum & average of N numbers.
3. WAP to convert integer arithmetic to a given number of day and month.
4. WAP to find maximum and minimum out of 3 numbers a, b & c.
5. WAP to find eb.
6. WAP to find factorial of positive integer.
7. WAP to find sum of series up to n number, 2+5+8+ +n.

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8. WAP to print all the number between 1 to 100 which are dividing by 7.
9. WAP to generate Fibonacci series up to n.
10. WAP to find position in class first =360, second=240, third=120 otherwise fail. Read marks of 3subjects.
11. Write an iterative function to calculate factorial of given number.
12. WAP to find whether number is prime or not.

Course Outcomes:

1. Understand the fundamentals of C programming.
2. Choose the loops and decision making statements to solve the problem.
3. Implement different Operations on arrays.
4. Use functions to solve the given problem.
5. Understand pointers, structures and unions.
6. Implement file Operations in C programming for a given application.

Text Book:

- Programming In C by Yatin Chaturvedi1st."Bhopal :Ram Prasad & Sons .,"2000.
- Programming In ANSI C by E Balagurusamy4th."New DelhiTata Mc Graw Hill Publishing"
- Programming with C by B.S. Gottfried &Schaums 2nd."New DelhiTata Mc Graw Hill Publishing"2008

Reference Books:

- Mastering C Paperback – 1 Jul 2017 by K R Venugopal; Sudeep R Prasad (Author)
- Programming with C by B.S. Gottfried &Schaums 2nd."New Delhi Tata Mc Graw Hill Publishing" 2008
- Test your Skills in C Paperback – 1 Jul 2017 by S. Selvi (Author), Murugesan , R. (Author)

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Software developers . Tutor. Computer Scientist And Analyst.	Able to understand programming languages and problem solving techniques. Able to develop programming skills using thefundamentals and basics of C Language.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Service consultancy. IT consultant. Freelancing.

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SEMESTER- 3rd
Course: Diploma CSE
SUBJECT: Computer Network Essentials

Subject Code: 2TDCS-303
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

- Students are familiar with the basics of data communication.
- Students are familiar with various types of computer networks.
- Students have experience in designing communication protocols. be exposed to the TCP/IP protocol suite

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	NETWORKING BASICS Introduction to computer networks Network services Basic Connectivity, File Service, File Transfer Service, application and security service, Sharing of multimedia elementsModels of Network Computing: Centralized, Distributed, Collaborative ComputingApplication of computer networks. Network Architecture. Feature and applications of : Peer to Peer Networks Client Server Networks Internets and Intranets LAN, MAN, WAN	ICT based class room teaching, Group Presentations, White board
Unit – II	DIGITAL COMMUNICATION Basic concepts, uses of channel, communication channels characteristics, Band Width, Attenuation, Bit rate and Baud rate, modulators and de-modulators synchronous &asynchronous modulators Serial and Parallel transmission, Analog and digital communicators Simplex, Half Duplex & Full Duplex Communications	ICT based class room teaching, Individual Presentation, White board
Unit – III	COMMUNICATION MEDIA AND DEVICES Transmission Media and channels Magnetic mediaTwisted pair Co-axial cable Optical Fiber. Line of site Transmission Communication satellites	ICT based class room teaching, Group Discussions, White board
Unit – IV	Bus Topology, Ring Topology, Star Topology, Mesh Topology, Tree Topology, HybridOSI reference model Physical layer Data Link layer Network layer Transport layer Session layer Presentation layer Application layer	ICT based class room teaching, White board
Unit - V	PROTOCOLS and NETWORK HARDWARE TCP / IP Protocols.NETBEUI Protocol IPX/SPX Protocol IP addressing schemeSubnettingMedia Access Method CSMA ProtocolPersistent and Non Persistent CSMA. CSMA/ CD -Connector (RJ-11, RJ- 45) Repeaters, Hubs, Switches, Routers, Bridges, Gateways. NIC , Types of NIC, Installation and configuration Testing of NIC with PING	ICT based class room teaching, Group Presentation, White board

Course Outcomes:

- Master the terminology and concepts of the OSI reference model and the TCP□IPreference model.
- To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.
- To be familiar with wireless networking concepts.
- To be familiar with contemporary issues in networking technologies. To be familiar with network tools and network programming

Text Book:

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- Data Communication and computer Networks by Prakash Gupta .C"NewDelhi:PHI Learning.,"
- Computer Networks by Andrew S. Tanenbaum 4th."Delhi:Pearson Education,"2009.
- Data Communication and computer Networks by Prakash Gupta .C"NewDelhi:PHI Learning.,"2011.

Reference Books:

- Simulation in Computer Network Design and Modeling: Use and Analysis: 1 Hardcover– Import, 15 Feb 2012 by Hussein Al-Bahadili (Editor)
- Computer Networks - A System Approach Paperback – 2011 by Peterson (Author)
- Computer Networks by Andrew S. Tanenbaum 4th."Delhi:Pearson Education,"2009.

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Network Engineer. Software developers. Tutor Computer Scientist	Able to understand the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Start-up consultant.

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SEMESTER- 3rd
Course: Diploma CSE
SUBJECT: Digital Techniques

Subject Code: 2T0DCS-304
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

- To know the concepts of Combinational circuits.
- To understand the concepts of flipflops, registers and counters
- Understand how logic circuits are used to solve engineering problems.
- Understand how logic circuits are analyzed, designed, verified, and tested.
- Understand the relationship between abstract logic characterizations and practical electrical implementations.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	FUNDAMENTAL CONCEPTS, LOGIC GATES Comparison between analog and digital signals.Different types of number system and codes used in digital computers. Basic Logic Gates: Logic symbols and truth table of all gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR. Realization of all other gates using universal gate.	ICT based class room teaching, Group Presentations, White board
Unit – II	BOOLEAN ALGEBRA, COMBINATIONAL LOGIC DESIGN Rules and laws of Boolean algebra, Demorgan'stheorem.Evaluation of logic expression, algebraic reduction of Boolean Introduction to logic designKarnaugh map representation of logical functions, Simplification of logical function using K-map, (2, 3, 4 variable) Sum of products (SOP) Pproduct of Sum (POS) . Don't care conditions. Design example: half adder, full adder, Half subtractor, full subtractor, BCD to seven-segment decoder (using k-map) Gray to binary code converter (using k-map) Universal Gate	ICT based class room teaching, Individual Presentation, White board
Unit – III	COMBINATIONAL LOGIC DESIGN USING MSIAND LSI CIRCUITS Multiplexer (:1) demultiplexer (1:4), Decoder (3:8) encoder (8:3) using combinational logic design. BCD adder, using (7483).ALU(74181). Digital comparator (7485),Parity generator/checkers(74180). Code converters: BCD to binary(74184), Binary to BCD(74185A) Priority encoder: Decimal to BCD(74147), Octal to binary priority encoder (74148) Hexadecimal to binary priority encoder using 74148 encoders. Decoder/drivers for display device:BCD to decimaldecoder/driver (7447, 7448)	ICT based class room teaching, Group Discussions, White board
Unit – IV	LOGIC FAMILIES Digital integrated circuits, its introduction Introduction: RTL, DTL, IIL, ECL, MOS familiesPropagation delay time, speed, power consumption,	ICT based class room teaching, White board
Unit - V	SEQUENTIAL LOGIC CIRCUIT One bit memory cell Flip-Flop-S-R, Clocked RS, T,D, J-K, master slave , JK Triggering of flip- flops, analysis of clocked sequential circuits, state reduction and assignment, Flip-flop excitation table, design procedures, design of counters, design with state equation. Working Principle and Truth-Table Registers ,shift registers. Working with SISO,SIPO,PISO,PIPO shift registers . Counters : Ripple counters, synchronous and asynchronous counters, timing sequences, Ring and Johnson counter, application of counters, Counter 4 Bit Counter, BCD	ICT based class room teaching, Group Presentation, White board

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LIST OF PRACTICALS:

1. Study andVerify the truth table of logic gates (74xx series).
2. Realization of AND, OR, NOT and Ex-ORlogic gates using NAND and NOR gate
3. Verification ofDemorgan's theorem
4. Implementation of full adder,substractor using gates Study of gray to binary code convertor using gates Study tomultiplexeranddemultiplexers.
5. Implementation of combination logic circuit using mux andDmux. Study of BCD adder
6. Study of BCD to seven segment decoder. Verification of truth table of flip flop using IC's Shift registersusingD flip-flop.
7. Presetable shift right, shift left registers.
8. Ripple counter using J-K flip-flop. Decode counter 7490.
9. Synchronous counter using J-K flip-flops. Up/down counter.
10. ModN counter using J-K flip-flop
11. Study of 6116 RAM. Study of 2732 EPROM

Course Outcomes:

After successful completion of the course student will be able to

- Develop a digital logic and apply it to solve real life problems.
- Analyze, design and implement combinational logic circuits.
- Classify different semiconductor memories.
- Analyze, design and implement sequential logic circuits.

Text Book:

- DIGITAL SYSTEMS : FROM GATES TO MICROPROCESSORS BY SANJAY K. BOSE 2ND . "NEW DELHI NEW AGE INTERNATIONAL"2008
- Analog and Digital Communication By P. Chakrabarti 1st. Delhi:Educational and Technical Publishers,2008.
- Lab Primer Through MATLAB : Digital Signal Processing, Digital Image Processing, Digital Signal Processor and Digital Communication by K.A. Navas& R. Jayadevan 1st. "New Delhi PHI Learning"

Reference books:

- Analogue and Digital Electronics for Engineers: An Introduction (Electronics Texts for Engineers and Scientists) Paperback – Import, 18 Oct 1984 by H. Ahmed (Author), P. J. Spreadbury (Author)
- Fundamentals of Digital Circuits Paperback – 2016 by Kumar A. Anand (Author)
- Analog and Digital Communication By P. Chakrabarti 1st. Delhi:Educational and Technical Publishers,2008

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Service Engineer. Network Engineer.	Able to understand how logic circuits are used to solve engineering problems. Able to handle Boolean algebra.	Goal 04(Quality education) Goal 09 (Financial growth Innovative)	Service Consultancy

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SEMESTER- 3rd
Course: Diploma CSE
SUBJECT: Operating System

Subject Code: 2TDCS-305
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

- To learn the mechanisms of OS to handle processes and threads and their communication
- To learn the mechanisms involved in memory management in contemporary OS
- To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols
- To know the components and management aspects of concurrency management
- To learn programmatically to implement simple OS mechanisms

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction Operating System Mainframe Systems Desktop Systems Multiprocessor Systems Distributed Systems Clustered Systems Real-Time Systems Handheld Systems Feature Migration Computing Environments	ICT based class room teaching, Group Presentations, White board
Unit – II	Computer- System Structures Computer-System OperationI/O Structure Storage Structure Storage Hierarchy Hardware Protection Network Structure	ICT based class room teaching, Individual Presentation, White board
Unit – III	Operating System Structures System Components Operating-System Services System Calls System Programs System Structure Virtual Machines System Design and Implementation System Generation	ICT based class room teaching, Group Discussions, White board
Unit – IV	Processes and multi threading, CPU Scheduling, Dead Locks Process Concept Process Scheduling Operations on Processes Cooperating Processes Inter process Communication in Client–Server Systems Multithreading Models Basic Concepts Scheduling Criteria Scheduling Algorithms Multiple-Processor Scheduling Real-Time Scheduling Algorithm Evaluation Process Scheduling Models Basic Concepts Deadlock Detection, Prevention Handling algorithm, excluding Banker's Algorithm	ICT based class room teaching, White board
Unit - V	Memory Management, File-System Interface& Implementation, Virtual Memory Swapping Contiguous& Non-Contiguous Memory Allocation Paging Segmentation with Paging File- system interface- File Concept- Access Methods- Directory Structure- File-System Mounting- File Sharing- Protection, File system implementation- File-System Structure- File-System Implementation- Directory Implementation- Allocation Methods- Free-Space Management- Efficiency and Performance- Recovery Definition Demand paging Page Replacement Algorithm Thrashing	ICT based class room teaching, Group Presentation, White board

Course Outcomes:

- To learn the fundamentals of Operating Systems.
- To learn the mechanisms of OS to handle processes and threads and their communication
- To learn the mechanisms involved in memory management in contemporary OS

Text Book:

- Operating System Principles by Abraham Silberschatz and Peter Baer Galvin and Greg Gagne 7th."New Delhi:Wiley India.,"2008.
- Operating System by H.M. Deitel& P.J. Deitel& D.R. Choffnes 3rd."Delhi:Pearson Education.,"2008.
- Refere Operating Systems by Gary Nutt &NabenduChaki&Sarmistha Neogy3rd."Delhi:Pearson Education.," 2009.

Reference Books:

- Modern Operating Systems 4e Paperback – 31 Aug 2016 by Tanenbaum (Author)
- Operating Systems Paperback – Jan 2016 by Rajiv Chopra (Author)
- Operating System by H.M. Deitel& P.J. Deitel& D.R. Choffnes4rd."Delhi:Pearson Education

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Software architect Kernel designer	Able to understand paging, fragementation concepts. Understanding of deadlock prevention. Able to handle risk management.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Start business Unit Service Consultancy

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SEMESTER- 4th
Course: Diploma CSE
SUBJECT: R programming

Subject Code: 2TDCS-401
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

In this course you will learn how to program in R and how to use R for effective data analysis. You will learn how to install and configure software necessary for a statistical programming environment and describe generic programming language concepts as they are implemented in a high-level statistical language. The course covers practical issues in statistical computing which includes programming in R, reading data into R, accessing R packages, writing R functions, debugging, profiling R code, and organizing and commenting R code. Topics in statistical data analysis will provide working examples.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	R Base Software, Understanding CRAN,R Studio The IDE, Sequence of Numbers, Vectors, Basic Operations, Operators and Types, R Functions, Logistic Regression in R, Reason for Logistic Regression, The Logistic Transform, Logistic Regression Modeling, Model Optimization, Understanding ROC Curve	ICT based class room teaching, Group Presentations, White board
Unit – II	Default Modeling using Logistic Regression in R, Decision Trees, Theory of Entropy & Information Gain, Stopping Rules, Cross Validations for Over fitting Problem, Pruning as a Solution for Over fitting, Ensemble Learning, Bootstrap Aggregation, Random Forests, Intrusion Detection in IT Network	ICT based class room teaching, Individual Presentation, White board
Unit – III	Linear Regression in R, Covariance and Correlation, Multivariate Analysis, Hypothesis Testing, Limitations of Regression, Business Case: Managing Credit Risk, Loss Given Default using Linear Regression Support Vector Machine, Classification as a Hyper Plane Location Problem, Motivation for Linear Support Vectors, Quadratic Optimization, Non Linear SVM, Kernel Functions Default Modeling using SVM in R	ICT based class room teaching, Group Discussions, White board
Unit – IV	Predictive Modeling, Decision Trees, Neural Networks, Predictive Modeling with Decision Trees, Neural Networks, Perception, MLP, Back Propagation ,Revision of Key Concepts Parameter Estimation, Hypothesis testing, Bayesian Analysis ,Identifying the best estimator, Other Statistical Theory, Model fitting, Linear Regression, Non-linear Regression Categorical Data Analysis, Time Series & Longitudinal Analysis	ICT based class room teaching, White board
Unit - V	Machine Learning, ANOVA/ Regression Analysis, Analysis of Variance & Covariance, Analysis of Variance, ANOVA Results, Examine Regression Results, Regression Analysis, Linear and Logistic Regression Tree and Bayesian Network Models, Decision Trees, Bagging, Random Forests ,Boosted Trees, Bayesian Classification Models	ICT based class room teaching, Group Presentation, White board

Course Outcomes:

- List motivation for learning a programming language
- Access online resources for R and import new function packages into the R workspace
- Import, review, manipulate and summarize data-sets in R
- Explore data-sets to create testable hypotheses and identify appropriate statistical tests
- Perform appropriate statistical tests using R
- Create and edit visualizations with R Requirements/Prerequisites: This course is aimed

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Text Book:

Reference Books:

- Hands on Programming With R: Write Your Own Functions and Simulations Paperback – 2014by Garrett Grolemund (Author)
- R Programming For Dummies,– 2016 by Andrie de Vries (Author), Joris Meys (Author)
- The Art of R Programming – by Norman Matloff (Author)

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Software Developer. Data Analyst. Web Designer. Tutor. Technical Analyst.	Able to understand to program in R and how to use R for effective data analysis.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	IT consultancy Start business unit.

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SEMESTER- 4th
Course: Diploma CSE
SUBJECT: Data Structures

Subject Code: 2TDCS-402
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

Data structures play a central role in modern computer science. In addition, data structures are essential building blocks in obtaining efficient algorithms. The objective of the course is to teach students how to design, write, and analyze the performance of programs that handle structured data and perform more complex tasks, typical of larger software projects. Students should acquire skills in using generic principles for data representation & manipulation with a view for efficiency, maintainability, and code reuse. Another goal of the course is to teach advance data structures concepts, which allow one to store collections of data with fast updates and queries.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	INTRODUCTION TO DATA STRUCTURE: Definitions & examples of stack, Primitive operations General concept of - Data, Data types, Data variable, Constants & their storage representation, Data types of C, Data Structure and their types, Linear data type, Non- Linear data type, Primitive data type, Non primitive data type etc.	ICT based class room teaching, Group Presentations, White board
Unit – II	ARRAYS: Arrays & their type One-dimensional, Two- dimensional Multidimensional Defining an array & physical allocation. Operations on arrays: Searching, Sorting Character stings in C, Arrays in C, - Structures & Unions in C.	ICT based class room teaching, Individual Presentation, White board
Unit – III	STACKS: Push, Pop Overflow & underflow of stack. Representing Stacks in C as an array Applications of stack. In-fix, Post-fix, Pre-fix, Converting in-fix to Post-fix and Pre-fix, Concept of recursion (with example Such as factorial, fibonacci sequence, multiplication of natural numbers).	ICT based class room teaching, Group Discussions, White board
Unit – IV	QUEUES. LINKED LIST: Introduction to queues, Definition of Queue Concept of queues Front, Rear, FIFO, Overflow Underflow. Operations on Queue Searching Insertion, Deletion, Types of queue, Priority queue, Circular queue - Introduction, Terminologies: Node, Address, Pointer, Information, Next, Null pointer, Empty listetc .Operations on list Searching, Insertion and Deletion Types of list slinked list and Circular list Array stacks, queues, implementation using list .Storage allocation and garbage collection	ICT based class room teaching, White board
Unit - V	SEARCHING & SORTING, INTRODUCTION TO TREES AND GRAPHS: Searching, Linear Search ,Binary Search ,Hash Search .Sorting Bubble Sort, Selection Sort, Merge Sort, Radix Sort, Bucket Sort, Heap Sort -Directed and Un-directed Graphs, Data Structure for graph representation. DFS, BFS Trees: Definition , Traversal, Pre order, In-order, Post-order, Data structure for Binary search tree.	ICT based class room teaching, Group Presentation, White board

LIST OF PRACTICALS

1. Program to search an element of array sing linaer search.
2. Program to reverse the element of array.
3. Insertion and deletion on array at specified position.
4. Program for Matrices operation-
   (i)Transpose (ii)Multiplication (iii)Addition (iv)Ad joint

5. Pogram to concatenate two strings using array.
6. Program based on structure union.
7. Program to implement PUSH and POP operation on stack.
8. Program based on queue & their operations for an application.
9. Program for implementation of circular queue.
10. Program based on list operations and its application.
11. Program based on pointers in C.
12. Implementation of tree using linked list.
13. Implementation of different types of sorting techniques.
14. Implementation of Binary search Algorithm using Binary tree
15. Assignment based on graph theory.

Course Outcome:-

On completion of the course:

- For a given search problem (linear search and binary search) student will be able to implement it.
- For a given problem of stacks, queues and link lists, students will be able to implement it and analyze the same to determine the time and computation complexity
- Students will be able to write an algorithm for selection sort, insertion sort, quick sort, merge sort, heap sort, bubble sort and compare their performance
- Students will be able to implement tree, graph search and traversal algorithms

Text Book:

- Data Structures Using C by Aaron M. Tenenbaum &YedidyahLangsam& Moshe J. Augenstein 1st."Delhi:Pearson Education .," 2008.
- Data Structures Using C by Aaron M. Tenenbaum &YedidyahLangsam& Moshe J. Augenstein
- Data Structures & Program Design In by Robert Kruse & C.L. Tondo & Bruce Leung

Reference Books:

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- Data Structures & Program Design In by Robert Kruse & C.L. Tondo & Bruce Leung

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Developer. Tutor.	Able to understand and manage data. Able to handle programming knowledge.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Start business Unit Service Consultancy

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SEMESTER- 4th
Course: Diploma CSE
SUBJECT: Computer Architecture

Subject Code: 2TDCS-403
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

- Broad understanding of the design of computer systems, including modern architectures and alternatives.
- Understanding of the interaction amongst architecture, applications and technology.
- Understanding of a framework for evaluating design decisions in terms of application requirements and performance measurements.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	COMPUTER ARCHITECTURE:Introduction to 8085 /8086 Architectural Block-Diagram Register Transfer and Micro-operations, bus and Memory Transfer, three state bus buffers memory transfer. Arithmetic, logic, shift, Binary adder, subtractor, incrementor, decrementor, Arithmetic circuits. Various logic micro-operations.& hardware implementation. Shift micro- operation-Hardware Implementation. ALU- circuits	ICT based class room teaching, Group Presentations, White board
Unit – II	INSTRUCTION CYCLE, INSTRUCTION CODES:Fetch, decode, Register & memory reference instructions AND to AC, ADD to AC, LDA, STA, BUN, BSA, ISZ. Input output instruction &interrupts.I/O Interface, Isolated v/s memory mapped I/O DMA- DMA Controller and DMA Transfer, I/O Processor.	ICT based class room teaching, Individual Presentation, White board
Unit – III	PROGRAMMING:M/C language, Assembly language, Assembler first pass, program loops, Programming Arithmetic & logic operations. Subroutines,I/PProgramming.	ICT based class room teaching, Group Discussions, White board
Unit – IV	CENTRAL PROCESSING UNIT: Register organization, stack organization, instruction format, address in gmodes, data transfer instructions and manipulation instruction, program control instruction, RISC and CISC.	ICT based class room teaching, White board
Unit - V	MEMORY ORGANIZATION: Main memory-RAM, ROM, Memory address map, Auxiliary memory-magnetic disc, tapes etc., Cache memory-Associative mapping, direct & set associative mapping. Virtual memory-Address Space, memory space, Address mapping using pages, page table, page replacement. Memory management hardware-Segment and page mapping, memory protection.	ICT based class room teaching, Group Presentation, White board

List of Practicals

1. Study of Multiplexer and Demultiplexer
2. Study of Half Adder and Subtractor
3. Study of Full Adder and Subtractor
4. WAP to add two 8 bit numbers and store the result at memory location 2000
5. WAP to multiply two 8 bit numbers stored at memory location 2000 and 2001 and stores the result atmemory location 2000 and 2001.
6. WAP to add two 16-bit numbers. Store the result at memory address starting from 2000.
7. WAP which tests if any bit is '0' in a data byte specified at an address 2000. If it is so, 00 would be stored at address 2001 and if not so then FF should be stored at the same address.
8. Assume that 3 bytes of data are stored at consecutive memory addresses of the data memory starting at 2000. Write a program which loads register C with (2000), i.e. with data contained at memory address 2000, D with (2001), E with (2002) and A with (2001).

9. Sixteen bytes of data are specified at consecutive data-memory locations starting at 2000. Write a program which increments the value of all sixteen bytes by 01.
10. WAP to add t 10 bytes stored at memory location starting from 3000. Store the result at memory location 300A

Course Outcomes:

- Ability to understand basic structure of computer.
- Ability to perform computer arithmetic operations.
- Ability to understand control unit operations.
- Ability to design memory organization that uses banks for different word size operations.
- Ability to understand the concept of cache mapping techniques.

Text Book:

- Computer Architecture and Organization by John P. Hayes
- Computer Architecture and Parallel Processing by Kai Hwang & Faye A. Briggs
- Computer Architecture and Organization (SOS) by Nicholas P. Carter

ReferenceBook:

- Advanced Computer Architecture by R.Y. Kain
- Computer Architecture: Pipelined and Parallel Processor Design by Michael J. Flynn
- Computer Architecture: Pipelined and Parallel Processor Design by Michael J. Flynn

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Hardware Engineer Tutor. Hardware Engineer. Computer Scientist . Computer operator.	Able to understand the design of computer systems, including modern architectures and alternatives. Able to understand the interaction amongst architecture, applications and technology.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	IT consultancy Start business unit.

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SEMESTER- 4th
Course: Diploma CSE
SUBJECT: Multimedia and Web Technology

Subject Code: 2TDCS-404
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

- To identify a range of concepts, techniques and tools for creating and editing the interactive multimedia applications.
- To identify the current and future issues related to multimedia technology.
- To identify both theoretical and practical aspects in designing multimedia systems surrounding the emergence of multimedia technologies using contemporary hardware and software technologies.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	MULTIMEDIA TECHNOLOGY AND ITS APPLICATIONS: Computer Technology and application of multimedia technology, Multimedia Technology and its different forms, Hardware and Softwarerequired.Plain text and formatted text, Hyper Text Mark-up Language (html), conversion of text formats, object linking and embedding concept and Text preparation tools.	ICT based class room teaching, Group Presentations, White board
Unit – II	DEVELOPMENT OF A WEB PAGE: Introduction to HTML Components of HTML Tags (closed and open), Elements, Attributes Structure of HTML code Head BodyStructure Tags Standard HTML, Tab HTML, Header, Title and body Block level tags Block Formatting, Heading, Paragraph, Comments, Breaks, Centre,TextAlignment and font size Text Level Tag Bold Italic, Moonscape, Underlined, strike through, superscript, subscript Horizontal Rules Colours in WEB page Background colour, Text colour, Link colourSpecial Characters Lists Ordered listsUnorderedlistsDefinitionlistNesting List The Metatag	ICT based class room teaching, Individual Presentation, White board
Unit – III	LINKING OF HTML DOCUMENTS AND IMAGES: Concepts of URL Linking HTML Documents Anchor Tag Linking to a Document in the same folder Linking to a Document in a different folderLinking to a Document on the web Linking to specific locations within the Document Inserting Email links Adding Images Types of images GIF JPEG PNG Effect of physical size and file size of image on downloading.IMGtagImageformattingAlignmentResizingVertical and Horizontal spacingWrappingtextImage as a linkImageMapsServer side Image mapClient side Image map	ICT based class room teaching, Group Discussions, White board
Unit – IV	TABLES, LISTS ,DEVELOPING HTML FORMS: Table TagsTable Tags<TABLE >, <TR>,<TH>, <TD>TagsSpanning Rows and Columns< ROWSPAN>, < COLSPAN>TagFormatting tables using attributes.BORDER, BORDERCOLOR, NOBORDER,BGCOLOR, BACKGROUND, ALLIGN,WIDTH,NOWRAP,CELLSPACING, CELLPADDINGCaption TagTag	ICT based class room teaching, White board
Unit - V	CREATING FRAMES AND LAYERS: Introduction to framesAdvantages and disadvantages of using frames.The<FRAMESET>, <FRAME> and <NOFRAME>tags.Formatting frames using attributes.Frame border, Border, No resize, Scrolling, Alignment, Margin WidthBordercolor.Frame targeting. Creation of layer, switching to different layers.CreatingForms.Form controls. Text controls. Password fieldsRadio buttons Check boxes Reset and submit buttons. The <TEXTAREA>Tag Including select field using <SELECT> and <OPTION> Tags Processing forms	ICT based class room teaching, Group Presentation, White board

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LIST OF PRACTICALS

1. Work with Text Processing Tools like note-pad, MS-Word, MS-FrontPage
2. Create, Process and Print Graphics using adobe Photoshop, Paint shop Pro s/w.
3. Capture sound using microphone, and process using Wave for Windows or Wave Studio.
4. Study basic features of animation tools like Animator Pro, Macromedia flash, 3-D studio/Max.
5. Study basic features of video editing and movie making tools like Video for window/Adobe premier
6. Design a simple web page using HTML Tags.
7. Design Table through HTML.
8. Design and implement Hyper link and special effects on web page.
9. Design form by using HTML.
10. Embed pictures and sound on web page.
11. And then performed by the students.

Course Outcomes:

Ability to develop proficiency in Webpage Development and website management

- Ability to develop proficiency in creating dynamic Web Interface
- Ability to write server and client sides scripts and manage websites
- Ability to design a web page using Image, Audio and Video editing tools
- Ability to understand the basic concepts of Open Source Standards and Open Source softwares
- Ability to understand the basic concepts of networking

Text Book:

- Multimedia Making IT Work by Tay Vaughan
- Fundamentals of Multimedia by ZE Nian Li & Mark S. Drew
- Multimedia System Design by P.K. Andleigh& K. Thakrar

Reference Book:

- Principles of Multimedia by Ranjan Parekh
- Multimedia In Action by James E. Shuman
- Multimedia System Design by Prabhat K. Andleigh and Kiran Thakrar

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Web developer . Web and graphics designer. Information architect. Front end developer	Able to understand concept of multimedia. Able to Understand different tags in HTML.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	IT consultancy . Start business unit.

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SEMESTER- 4th
Course: Diploma CSE
SUBJECT: IT Trends and Technologies

Subject Code: 2TDCS-405
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

This course will introduce students to new directions in information systems and effective approaches for evaluating their relevance and applicability to their business environments as well as the new challenges and problems that they present. They will learn about emerging technologies and the latest design trends in data and knowledge, networks and applications in terms of what issues they address and in particular, how organizations can exploit them for competitive advantage

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	PARALLEL COMPUTING: Parallel virtual machine (PVM) and message passing interface (MPI) libraries and calls. Advanced architectures, Today's fastest computers.	ICT based class room teaching, Group Presentations, White board
Unit – II	MOBILE COMPUTING: Mobile connectivity-cells, framework, wireless delivery technology and switching methods, mobile information access devices mobile data internetworking standards, cellular data communication protocol, mobile databases- protocols, scope, tools and technology. M-business.WAP/Blue tooth.E-Technologies	ICT based class room teaching, Individual Presentation, White board
Unit – III	ELECTRONIC COMMERCE: Framework, media convergence of applications, Consumer applications, organization applicationsElectronic PaymentSystemsDigital token, smart card, credit card, risk in electronic payment system, designing electronic payment systemElectronic Data Interchange (EDI)Concept, application (legal, security & privacy) issues, EDI & electronic commerce, standardization & EDI, EDI software implementation, EDI envelop for message transport, Internet based EDI Digital LibraryConcept, type of digital document issue behind document infrastructure	ICT based class room teaching, Group Discussions, White board
Unit – IV	SOFTWARE AGENTS: Characteristics and properties of agents, technology behind software agents.GIS And ERPMain concept in geographical information system E-cash, EBusiness, ERP packages	ICT based class room teaching, White board
Unit - V	DATA WAREHOUSING: Data warehousing environment, architecture of a data warehousing methodology, analysis design, construction and administration Data Mining - Extracting models & patterns from large database, data mining techniques, classification, regression, clustering, summarization, dependency modeling, link analysis, sequencing analysis, mining scientific & business data	ICT based class room teaching, Group Presentation, White board

Course Outcome:

- Student will understand about parallel computing
- Student will understand about mobile computing
- Student will understand about data warehousing
- Student will understand about software agents

Text Book:

- Data Warehousing : Fundamentals for IT Professionals by Paulraj Ponniah

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- Data Warehousing, Data Mining & OLAP by Alex Berson
- Data Warehousing by C.S.R. Prabhu

Reference Book:

- Data Warehousing, Data Mining & OLAP by Alex Berson
- Data Warehousing by C.S.R. Prabhu
- Data Warehousing, Data Mining, & OLAP by Alex Berson& Stephen J. Smith
- Data Warehousing : Fundamentals for IT Professionals by Paulraj Ponniah
- Data Warehousing, Data Mining & OLAP by Alex Berson
- Data Warehousing by C.S.R. Prabhu

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Data Analyst. Data scientist.	Able to understand about parallel computing, mobile computing and data warehousing.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	IT consultancy . Start business unit.

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SEMESTER- 5th
Course: Diploma CSE
SUBJECT: Software Engineering

Subject Code: 2TDCS-501
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

The basic objective of software engineering is to develop methods and procedures for software development that can scale up for large systems and that can be used consistently to produce high-quality software at low cost and with a small cycle of time.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction to software engineering, Importance of software, The evolving role of software, Software Characteristics, Software Components, Software Applications, Software Crisis, Software engineering problems, Software Development Life Cycle, Software Process.	ICT based class room teaching, Group Presentations, White board
Unit – II	Water Fall Model, The Incremental Model, Prototyping, Spiral Model, role of management in software, development. Design principles, problem partitioning, abstraction, and top down and bottom up-design, structured approach, functional versus object oriented approach, Cohesion, Coupling.	ICT based class room teaching, Individual Presentation, White board
Unit – III	Programming approaches, structured programming, programming style and internal documentation, Testing,Types of testing, Levels of testing, Life cycle, test plan, Verification & validation, debugging.	ICT based class room teaching, Group Discussions, White board
Unit – IV	The Management spectrum- (The people, the product, the process, the project), cost estimation, project,scheduling, staffing, software configuration management, Maintenance and its types, quality assurance plan,project monitoring, risk management.	ICT based class room teaching, White board
Unit - V	Reliability, Reliability metrics, Reliability growth modeling, Software quality, ISO 9000 certification for, software industry, SEI capability maturity model, comparison between ISO & SEI CMM. CASE and its Scope, CASE support in software life cycle, documentation, project management, Reverse Software Engineering, Architecture of CASE environment.	ICT based class room teaching, Group Presentation, White board

Course Outcomes:

Graduates of the program are expected to demonstrate:

- An Ability To apply knowledge of mathematics, science, and engineering.
- An Ability to design and conduct experiments, as well as to analyze and interpret data.
- An Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to function on multi-disciplinary teams.
- An Ability to identify, formulate, and solve engineering problems.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.

Text Book:

- Software Engineering by Rajan Mathew
- An Integrated Approach to Software Engineering by Pankaj Jalote

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- Theory and Problems of Software Engineering by David A. Gustafson &Schaums

Reference Book:

- Software Engineering by K.K. Aggarwal & Yogesh Singh
- Software Engineering Fundamentals by Ali Behforooz& Frederick J. Hudson
- Software Engineering by Ian Sommerville

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Research Scientist. System manager. Computer network architect.	Able to develop methods and procedures for software development . Understand softwarelife cycle. Able to understandcohesion and Coupling.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Start business Unit IT Consultancy

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SEMESTER- 5th
Course: Diploma CSE
SUBJECT: Introduction to JAVA

Subject Code: 2TDCS-502
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

This course provides an introduction to object oriented programming (OOP) using the Java programming language.
Its main objective is to teach the basic concepts and techniques which form the object oriented programming paradigm
The model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism
Fundamental features of an object oriented language like Java: object classes and interfaces, exceptions and libraries of object collections.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	INTRODUCTION & FUNDAMENTALS Features of Java, newly added features in Java2,introduction to OOPS, data types,variables, literals, expressions, operators, arrays and programming constructs, Garbage Collection, Comparision with C++, Java Virtual Machines, Java Class Libraries	ICT based class room teaching, Group Presentations, White board
Unit – II	CLASSES AND OBJECTS Classes and Objects, Objects and References, , Method: Defining method, calling method,passing arguments to method, this keyword, overloading method, static, Access specifiers; public, default, private & protected. Command line arguments, constructors and finalizers, overloading constructors, inner classes.Introduction to inheritance; definition and advantages, overriding, Super , final and abstract classes, Interface , Package.	ICT based class room teaching, Individual Presentation, White board
1Unit – III	EXCEPTIONS, STRING AND VECTOR Basics of exception handling, default Exception handling, try and catch, Multiple catch statements, try-catch- finally, uses of throw and throws, Strings: string constructor, string arithmetic, string methods, stringbuffer and methods, Introduction and programming using Vector, Iterator and Enumeration.	ICT based class room teaching, Group Discussions, White board
Unit – IV	MULTITHREADING Thread Concepts, Thread lifecycle, Runnable Vs Thread Class, Thread Priority, Thread Methods, Thread Synchronization: Concept of Monitor, Synchronized methods & Synchronized blocks.	ICT based class room teaching, White board
Unit - V	INTERNET PROGRAMMING WITH JAVA AWT, applets and application, user interfacing components, Events and Event Handling, Overview of Swing Components, Java Database Connectivity: JDBC, ODBC, executing DDL, DML command.	ICT based class room teaching, Group Presentation, White board

LIST OF PRACTICALS

1 WAP to find the average and sum of the N numbers Using Command line argument. 2 WAP to Test the Prime number.
3 WAP to create a Simple class to find out the Area and perimeter of rectangle and box using super and this keyword.
4 WAP to design a class account using the inheritance and static that show all function of bank (withrowal, deposite).
5 WAP to find the factorial of a given number using Recursion.
6 WAP to design a class using abstract Methods and Classes.

7 WAP to design a String class that perform String Method(Equal,Reverse the string,change case). 8 WAP to handle the Exception using try and multiple catch block.
9 WAP that Implement the Nested try Statements.
10 WAP that import the user define package and access the Member variable of classes that Contained by Package.
11 WAP that show the partial implementation of Interface.
12 WAP to Handle the user define d Exception using throw keyword. 13 WAP to create a thread that Implement the Runable interface.
14 WAP to create a class component that show controls and event handling on that controls.(math calc). 15 WAP to Draw the line, Rectangle,oval,text using the graphics method.
16 WAP to create a Menu using the frame. 17 WAP to create a Dialogbox.

Course Outcome:

1. Construct problem definition statements for real life applications and implement a database for the same.
2. Design conceptual models of a database using ER modeling for real life applications and also construct queries in Relational Algebra
3. Create and populate a RDBMS, using SQL.
4. Write queries in SQL to retrieve any type of information from a data base.
5. Analyze and apply concepts of normalization to design an optimal

Text Book:

- Programming With JAVA A Primer by E. Balagurusamy
- Big Java :Compartible With Java 5& 6 by Cay Horstmann
- Introduction to Object Oriented Programming Through : Java by Group ISRD

Reference Book:

- Java : How To Pragram (With CD) by Paul Deitel
- Beginning Java 2 JDK 5 Edition by Ivor Horton`s
- Java 2 Programming Black Book by Holzner Steven & Al Et

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Software Developer. Web Designer. Graphics Designer. Tutor.	Able to understamd concept of OOP's to build program. Able to perform Database connectivity to frond end program to make web based applications.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Freelancing. Service consultant.

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SEMESTER- 5th
Course: Diploma CSE
SUBJECT: PHP and MYSQL

Subject Code: 2TDCS-503
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

The PHP programming skills needed to successfully build interactive, data-driven sites. Workwith regular expressions, handle exceptions, and validate data.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	INTRODUCTION & BASIC TO PHP . History of PHP, Apache Web Server, MySQL and Open Source, Relationship between Apache, MySQL and PHP (AMP Module), PHP configuration in IIS ,Apache Web server, PHP structure and syntax ,Creating the PHP pages,Rules of PHP syntax, Integrating HTML with PHP , Constants, Variables : static and global variable, Conditional Structure & Looping, PHP Operators , Arrays, foreach constructs ,User defined function, argument function, Variable function, Return Function, default argument, variable length argument	ICT based class room teaching, Group Presentations, White board
Unit – II	WORKING WITH FUNCTIONS. Variable Function : gettype, settype, isset, unset, strval, floatval,intval, print_r , String Function : chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim trim, substr, strcmp, trcasecmp, strops, strrpos, strstr, stristr, str_replace, strrev, echo, print, Math Function : abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand, Date Function : date, getdate, setdate, checkdate, time, mktime , Array Function : count, list, in_array, current, next, previous, end, each, sort, array_merge, array_reverse , File Function : fopen,fread,fwrite,fclose	ICT based class room teaching, Individual Presentation, White board
Unit – III	WORKING WITH DATA. FORM element, INPUT elements , Processing the form, User Input ,INPUT checkbox type , one form, multiple processing , Radio INPUT element , Multiple submit buttons , Basic input testing , Dynamic page title , Manipulating the string as an array ,Adding items , Validating the user input , Passing variables between pages , Passing variables through a URL , Passing variables with sessions , Passing variables with cookies, Passing information with forms	ICT based class room teaching, Group Discussions, White board
Unit – IV	IMAGES WITH PHP & INTRODUCTION TO MYSQL Error types in PHP, Generating PHP errors, Exceptions , Working with GD Library , File types with GD and PHP , Compiling PHP with GD , Creating the image table ,Uploading the image . MySQL structure and syntax , Types of MySQL tables and storages engines , MySQL commands ,Integration of PHP with MySQL , Connection to the MySQL server, Working with PHP and arrays of data , Referencing two tables , Joining two tables	ICT based class room teaching, White board
Unit - V	WORKING WITH DATABASE	ICT based class room teaching, Group

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	Creating a table , Manipulating the table , Filling the table with data , Adding links to the table , Adding data to the table , Displaying the new information ,Displaying the movie details , Editing the database , Inserting a record ,Deleting a record , Editing data	Presentation, White board

LIST OF PRACTICAL:

1. Creating the PHP page.
2 Programs using arrays and control and loop structures
3 Testing different PHP functions and user define function.
4 Creating forms using buttons, textboxes and other form elements.Use ($_POST and $_GET to retrieve data.)
5. Passing hidden information to the form processing script via hidden form controls and a URL query string.
6. Creating forms with sessions and cookies.
7. Error handling and exception creating error handling pages with PHP. 8.Enabling PHP setup to include the GD Library.
9. Allowing the user to upload their own images. 10.View the data contained in the My SQL database. 11.Connect to the database from your website.
12. Programs to manipulate the table.

Course Outcome:

Student will able to do

- Implement interactive web page(s) using HTML, CSS and JavaScript.
- Design a responsive web site using HTML5 and CSS
- Build Dynamic web site using server side PHP Programming and Database connectivity
- Describe and differentiate different Web Extensions and Web Services.
- Demonstrate web application using Python web Framework-Django

Text Book:

- Web Enabled Commercial Application Developing Using : HTML, JavaScript DHTML and PHP with CD by Ivan Bayross
- SQL Programming Style by Joe Celko
- Professional SQL Server 2005 Programming by R. Vieira
- Database Management System Oracle SQL and PL/SQL by Pranab Kumar Das Gupta &P. Radha Krishna

Reference Book:

- The Complete Reference SQL by James R. Groff & Paul N. Weinberg
- Oracle Database Ajax and Php Web Application Development by Lee Barney & M. Mcaulghlin
- Web Technologies : HTML, Java Script, PHP, Java JSP XML and Ajax Black Book by Kogent Learning Solutions
- PHP Advanced and Object-Oriented Programming by Larry Ullman
- Web Enabled Commercial Application Developing Using : HTML, JavaScript DHTML and PHP with CD by Ivan Bayross

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Web Developer. Tutor. Web Designer.	Able to build Dynamic web site using server side PHP Programming and Database connectivity.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Freelancing. Service consultant.

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SEMESTER- 5th
Course: Diploma CSE
SUBJECT: Microprocessor and its Interfacing

Subject Code: 2TDCS-504
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

- To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
- To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	INTRODUCTION TO MICROPROCESSORS & ARCHITECTURE OF 8085 MICROPROCESSORS Evolution of microprocessors; Specific features of microprocessors; Application of microprocessors.Functional Block Diagram and Internal Architecture of 8085 – ALU, Registers, Control Chapter, Clocks, Bus Structure; Address, Data and Control Bus of 8085; Function of different pins of 8085; Programming model of 8085 Microprocessor; Demultiplexing the multiplexed Buses; Generating Control Signals.	ICT based class room teaching, Group Presentations, White board
Unit – II	PROGRAMMING OF 8085 MICROPROCESSORS Instruction Classification of 8085; Instruction Format and Length of instruction; Different Addressing modes of 8085; Definition of Instruction cycle, Machine Cycle and T-State; Recognition of Machine Cycle & T-State of 8085;Bus Idle Cycle; Timing Diagram of Opcode Fetch, Memory and I/O Read, Memory and I/O write; Timing diagram of typical Instructions like MOV, MVI, LXI, LDA, STA, IN, OUT, PUSH, POP, ADD, ADI; Solving basic problems by using Assembly Language Programming of 8085, Simple Arithmetic and Data transfer Program.	ICT based class room teaching, Individual Presentation, White board
Unit – III	INTERFACING OF MEMORY AND I/O PORTS WITH 8085 Memory mapped I/O, I/O mapped I/O; address Decoding and Interfacing of Memory(Both RAM & ROM); The 8255A Programmable Peripheral Interface – Internal Block diagram and function, Different operating modes & Control Word Formats; Interrupt mechanism of 8085, Multiple interrupt and Priorities, Software Interrupts of 8085; The 8259A Programmable Interrupt Controller – Block Diagram & Function only; DMA Description with sequence of steps and control flow, Structure of a generic DMA controller 8237; Basic concept of Interfacing Data Converters.	ICT based class room teaching, Group Discussions, White board
Unit – IV	STUDY OF 16-BIT MICROPROCESSOR 8086 Architectural block diagram of 8086 and its function, Different functional Chapters, Different Register & flags; Function of different Pins of 8086 microprocessor, Maximum and Minimum Modes of 8086 Microprocessor; Concept of Segmentation used in 8086 Microprocessor: Difference between 8086 and 8088 Microprocessor, Interfacing Memory Banks To 8086;	ICT based class room teaching, White board
Unit - V	INTERRUPT OF 8086 8086 Interrupt mechanism, Predefined Interrupts of 8086, Concept of Interrupt Vector table, User defined Software Interrupt; Basic Instruction Set of 8086 (ADD,SUB,MUL,DIV,MOV,BranchingInstructions,LOOP,INT etc.); Concept of Assembly Language Programming, Assembler Directives.	ICT based class room teaching, Group Presentation, White board

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LIST OF PRACTICALS

1. 8-bit addition and Subtraction
2. BCD subtraction
3. 8 - bit multiplication and BCD multiplication.
4. 8-bit division.
5. Searching for an element in an array.
6. Sorting in Ascending order.
7. Finding largest and smallest elements from an array.
8. Reversing array elements.
9 BCD to Hex and Hex to BCD.
10. Binary to ASCII and ASCII to binary.
11. ASCII to BCD and BCD to ASCII.

Course Outcome:

Students will be able to:

- Apply the fundamentals of assembly level programming of microprocessors.
- Build a program on a microprocessor using arithmetic & logical instruction set of 8086.
- Develop the assembly level programming using 8086 loop instruction set.
- Write programs based on string and procedure for 8086 microprocessor.
- Analyze abstract problems and apply a combination of hardware and software to address the problem

Text Book:

- Advanced Microprocessors and Peripherals by K.M. Bhurchandi and A.K. Ray
- Digital Systems : From Gates to Microprocessors By Sanjay k. Bose
- Fundamentals of Digital Electronics and Microprocessors by Anokh Singh & A.K. Chhabra
- Advanced Microprocessors And Interfacing by Ram Badri

Reference Book:

- Advanced Microprocessors and Peripherals by A.K. Ray & K.M. Bhurchandi
- Microprocessor Architecture Programming and Applications With the 8085 by R. Gaonkar
- Microprocessors : Theory and Applications Intel and Motorola by M. Rafiquzzaman
- Pentium Microprocessor by J.G. Antonakos
- Microprocessor Architecture Programming and Appplications with the 8085 (with CD) by Ramesh Gaonkar

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Programmer. Embedded Engineer. Tutor	Able to understand the fundamentals of assembly level programming of microprocessors. Able to analyze problems and apply a combination of hardware and software to address the problem	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Freelancing. Service consultant.

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SEMESTER- 5th
Course: Diploma CSE
SUBJECT: Data Communication

Subject Code: 2TDCS-504
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

The students will be able to:

1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. Introduce the student to advanced networking concepts, preparing the student forestry Advanced courses in computer networking.
4. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Introduction to data communication: Components ,data representation ,data flow and basic model ,data representation .Serial & Parallel transmission , Modes of data transmission, Encoding: Unipolar, Polar .Bipolar line & block codes ,Data compression .Frequency dependant codes, Run length encoding .Relative encoding ,LZ Compression .Image and multimedia compression. Review of analog & digital transmission methods, Nyquist Theorem .	ICT based class room teaching, Group Presentations, White board
Unit – II	Multiplexing: FDM, TDM, WDM, Synchronous & Statistical TDM, North American digital multiplexing hierarchy, European TDM, Spread spectrum: Frequency Hopping & Direct Sequence spread spectrum. Terminal handling & polling. Switched Communication Networks: Circuit, Message, Packet & Hybrid Switching, Soft switch Architecture with their comparative study, X.25, ISDN.	ICT based class room teaching, Individual Presentation, White board
Unit – III	Physical Layer: Introduction, Interface, Standards, EIA-202-D, RJ-34, RJ-11, BNC connector & EIA-449 digital Interface: Connection, specifications & configuration, X.21 Modem: Types, features, signal constellation, block schematic, limited distance, dial up, baseband, line driver, Group Band and Null modems etc., ITU-T V-series modem standards Connecting Devices: Active and Passive Hubs, Repeaters, Bridges, Two & Three layer switches & Gateway. Study of various types of topology and their comparative study and introduction to queing theory.	ICT based class room teaching, Group Discussions, White board
Unit – IV	Transmission Media: Transmission line characteristics, distortions, Crosstalk, Guided Media: Twisted Pair, Baseband & Broadband Coaxial. Optical Fiber : Physics and velocity of propagation of light, Advantages & Disadvantages ,Block diagram .Nodes and classificationComparision,losses ,light source and detectors , Construction, Unguided media : Electromagnetic polarization ,Rays and wavesfront .electromagnetic spectrum and radiation .spherical wave front and inverse square law , wave attenuation and absorption, optical properties of Radio waves , Terrestrial Propagation of electromagnetic waves , skip distance , free - space path loss .Radio waves , Microwave , Infrared & Satellite Communication system . Telephone Network: Components, LATAs, signaling and Services, Digital Subscriber Line: ADSL, HDSL, SDSL, VDSL, Cable TV network for data transfer.	ICT based class room teaching, White board
Unit - V	Transmission Errors :Content Error, flow integrity error, methods of error control .Error detection .Error correction ,Bit error rate , Error detection methods: Parity checking , Checksum Error Detection .Cyclic Redundancy Check ,Hamming code , Interleaved codes , Block Parity , Convolution code, Hardware Implementation, Checksum .	ICT based class room teaching, Group Presentation, White board

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Course Outcomes:

After completing this course the student must demonstrate the knowledge and ability to:

1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of eachlayer.
5. Identify the different types of network devices and their functions within a network
6. Understand and building the skills of subnetting and routing mechanisms.
7. Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

Text Book:

- Data Communications and Computer Networks by Brijendra Singh
- Fundamentals of Voice and Data Communication by K.K. Sharma
- Advanced Microprocessors and Peripherals by K M Bhurchandi& A K Ray

Reference Book:

- Data Communications and Computer Networks by P.C. Gupta
- Data Communication and Computer Networks by ISRD Group
- Introduction to Data Communications and Networking by W. Tomasi
- Data Communications and Computer Networks by Brijendra Singh
- Fundamentals of Voice and Data Communication by K.K. Sharma
- Advanced Microprocessors and Peripherals by K M Bhurchandi& A K Ray

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Network Engineer. Tutor Hardware Engineer.	Able to understand basic computer network technology and explain Data Communications System and its components. Able to understand advanced networking concepts and become expertise in some specific areas of networking such as the design and maintenance of individual networks.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Freelancing. Service consultant.

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SEMESTER- 6th
Course: Diploma CSE
SUBJECT: UNIX and Shell programming

Subject Code: 2TDCS-601
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

This course will prepare students to develop software in and for Linux/UNIX environments. Topics to be covered include basic operating system concepts, effective command line usage, shell programming, the C language, programming development tools, system programming, network programming (client-server model and sockets), and GUI programming.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	File and common commands - Shell - More about files - Directories- Unix system - Basics of file Directories and filenames - Permissions - modes - Directory hierarchy - Devices - the grep family - Other filters - the stream editor sed - the awk pattern scanning and processing language - files and good filters.	ICT based class room teaching, Group Presentations, White board
Unit – II	Command line structure - Metacharacters - Creating new commands - Command arguments and parameters - program output as arguments - Shell variables - More on I/O redirection - loop in shell programs - Bundle - Setting shell attributes, Shift command line parameters - Exiting a command or the shell, evaluating arguments - Executing command without invoking a new process - Trapping exit codes -- Conditional expressions.	ICT based class room teaching, Individual Presentation, White board
Unit – III	Customizing the cal command, Functions of command, While and Until loops - Traps - Catching interrupts - Replacing a file - Overwrite - Zap - Pick command - News command - Get and Put tracking file changes.	ICT based class room teaching, Group Discussions, White board
Unit – IV	Standard input and output - Program arguments - file access - A screen at a time printer - On bugs and debugging - Examples - Zap - pick - Interactive file comparison program - Accessing the environment - Unix system calls - Low level I/O, File system Directories and modes, Processors, Signal and Interrupts.	ICT based class room teaching, White board
Unit - V	PROGRAM DEVELOPMENT AND DOCUMENT PREPARATION Program development - Four function calculator - Variables and error recovery - Arbitrary variable names, Built in functions, Compilation into a machine, Control flow and relational operators, Functions and procedures -Performance evaluation - Ms macro package - Troff level - Tbl and eqn preprocessors - Manual page - Other document preparation.	ICT based class room teaching, Group Presentation, White board

LIST OF PRACTICALS

1. Prime Test.
2. Menu Driven Shell Script - Sort with various options.
3. User friendly change of modes (chmod).
4. Write a shell script to generate the Fibonacci series.
5. Write a shell script to reverse the digits of a given number.
6. Write a shell script to accept three numbers and display the largest. 7 Write a shell script to find the number of files in a directory.
8. Write a shell script to display first ten positive numbers using until loop.
9. Write a shell script to check if a particular user has logged in or not. If not, continue the loop till he/she logins. Once the required user logins display a message.

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10. Write a shell script to accept the name, grade and basic salary from the user. Write the details in to a file called employee, separating the fields with a colon(,)continue the process till the user wants.
11. Write a shell script to printthefirst10odd numbers using the while loop

Course Outcomes:

- Understanding the basic set of commands and utilities in Linux/UNIX systems.
- To learn to develop software for Linux/UNIX systems.
- To learn the C language and get experience programming in C.
- To learn the important Linux/UNIX library functions and system calls.
- To understand the inner workings of UNIX-like operating systems.
- To obtain a foundation for an advanced course in operating systems.

Text Book:

- Test Your UNIX Skills by YashavantKanetkar
- Unix Network Programming by W. Richard Stevens
- The Unix Programming Environment by Brian W. Kernighan & Rob Pike
- Teach Yourself UNIX Shell Programming in 14 Days by Kamran Husain
- UNIX Concepts and Applications by Sumitabha Das

Reference Book:

- Unix and Shell Programming : ATB. by Behrouz A. Forouzan and Richard F. Gilberg
- A Beginner`s Guide to Unix by N.P. Gopalan and B.Sivaselvan
- Introduction to Unix and shell programming by M.G. Venkateshmurthy
- Introduction to Unix & Shell Programming by M.G. Venkateshmurthy
- Unix Concepts and Applications by Sumitabha Das
- Test Your UNIX Skills by YashavantKanetkar
- Unix Network Programming by W. Richard Stevens
- The Unix Programming Environment by Brian W. Kernighan & Rob Pike
- Teach Yourself UNIX Shell Programming in 14 Days by Kamran Husain
- UNIX Concepts and Applications by Sumitabha Das

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Shell Programmer. Software Developer. Technical analyst. Technical writer. Tutor.	Able to Understandthe basic set of commands and utilities in Linux/UNIX systems. Able to understand the workings of UNIX-like operating systems.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Freelancing. Service consultant.

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SEMESTER- 6th
Course: Diploma CSE
SUBJECT: E-Commerce and ERP

Subject Code: 2TDCS-602
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

The objectives of the course are to introduce the concept of electronic commerce, and to understand how electronic commerce is affecting business enterprises, governments, consumers and people in general. In addition, we will study the development of websites using relevant software tools.

- Acquaint students with a fundamental understanding of the environment and strategies in the New Economy.
- Provide analytical tools to understand opportunities in unserved or underserved New Economy markets.
- Provide a fundamental understanding of the different types and key components on business models in the New Economy.
- Provide guiding principles behind the design and strategy of the customer web interface.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	ELECTRONIC COMMERCE :Overview, Definitions, Advantages & Disadvantages of E – Commerce, Threats of E – Commerce, Managerial Prospective , Rules & Regulations For Controlling E – Commerce, Cyber Laws.	ICT based class room teaching, Group Presentations, White board
Unit – II	BUSINESS MODELS OF E – COMMERCE Model Based On Transaction Type, Model Based On Transaction Party - B2B, B2C, C2B, C2C, E – Governance. E – strategy : Overview, Strategic Methods for developing E – commerce.	ICT based class room teaching, Individual Presentation, White board
Unit – III	SUPPLY CHAIN MANAGEMENT E – logistics, Supply Chain Portal, Supply Chain Planning Tools (SCP Tools), Supply Chain Execution (SCE), SCE – F framework, Internet's effect on Supply Chain Power. E – Payment Mechanism : Payment through card system, E – Cheque, E – Cash, E – Payment Threats & Protections.	ICT based class room teaching, Group Discussions, White board
Unit – IV	ENTERPRISE RESOURCE PLANNING (ERP) Features, capabilities and Overview of Commercial Software, re-engineering work processes for IT applications, Business Process Redesign, Knowledge engineering and data warehouse . Business Modules : Finance, Manufacturing (Production), Human Resources, Plant Maintenance.	ICT based class room teaching, White board
Unit - V	ERP MODULES Materials Management, Quality Management, Sales& Distribution ERP Package, ERP Market: ERP Market Place, SAP AG, PeopleSoft, BAAN, JD Edwards, Oracle Corporation ERP-Present and Future: Enterprise Application Integration (EAI), ERP and E-Commerce, ERP and Internet, Future Directions in ERP	ICT based class room teaching, Group Presentation, White board

Course Outcome-

At the end of the course, the students is expected to realise the problems involved in designing and building e-commerce systems; understand the need to design EC systems that fully meet the requirements of the intended users; appreciate the need to ensure that the implementation of a design is adequately tested to ensure that the completed EC system meets the specifications; be fully

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aware of the principles and practice of an O-O approach to the design and development of EC systems; be able to apply these principles in practice.

1. Explain the components and roles of the Electronic Commerce environment.
2. Explain how businesses sell products and services on the Web.
3. Describe the qualities of an effective Web business presence.
4. Describe E-Commerce payment systems.

Text Book:

- E-Commerce the Cutting Edge of Business by K.K. Bajaj & D. Nag
- E-Commerce : Fundamentals and Applications by Henry Chan & Raymond Lee &Tharam Dillon & Elizabeth Chang
- Enterprise Resource Planning by Alexis Leon
- Enterprise Resource Planning Concepts and Practice by V.K. Garg & N.K. Venkitakrishanan

Reference Book:

- E-Commerce the Cutting Edge of Business by K.K. Bajaj & D. Nag
- Essentials of E-Commerce Technology by V. Rajaraman
- E-Commerce : Fundamentals and Applications by Henry Chan & Raymond Lee &Tharam Dillon & Elizabeth Chang

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Digital marketing manager. Tutor Start-up consultant.	Able to understand a fundamental understanding of the environment and strategies in the New Economy. Able to understand different types and key components on business models in the New Economy.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Freelancing. Short business unit (retail and macro)'

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SEMESTER- 6th
Course: Diploma CSE
SUBJECT: Computer Graphics and Multimedia

Subject Code: 2TDCS-603
Theory Max. Marks: 50
Theory Min. Marks:17

COURSE OBJECTIVE:

- To learn the basic principles of 3-dimensional computer graphics.
- Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition.
- Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.
- To be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications.
- To comprehend and analyze the fundamentals of animation, virtual reality, underlying technologies, principles.

Syllabus:

Unit	Unit wise course contents	Methodology Adopted
Unit – I	INTRODUCTION TO GRAPHIC PRESENTATION OF PICTURE & OVERVIEW OF GRAPHICS SYSTEM Definition of Computer Graphics – Different Steps to Present a Picture – Picture Files – Display Files – Pixel.Cathode Ray Tubes - Raster Scan Displays - Random Scan Displays - Flat Panel Displays.	ICT based class room teaching, Group Presentations, White board
Unit – II	OUTPUT PRIMITIVES Points & lines – Line drawing algorithm – Brasenham's line drawing algorithm – Circle generating algorithm –Properties of circle – Midpoint circle algorithm – Ellipse generating algorithm – Properties of Ellipse – Mid point ellipse algorithm.	ICT based class room teaching, Individual Presentation, White board
Unit – III	GEOMETRIC TRANSFORMATIONS Basic Transformations – Translation – Rotation – Scaling – Homogeneous Co-ordinates – Other Transformations – Reflections in Different Lines, Axis & Points – Shear.	ICT based class room teaching, Group Discussions, White board
Unit – IV	VIEWING Projections – Parallel Projections – Perspective Projections – Windowing – Clipping - Normalized View Volume – View Port Clipping.	ICT based class room teaching, White board
Unit - V	COMPUTER ANIMATIONS Design of animation sequence – General Computer Animation Function – Raster Animation – Computer Animation Language – Key Frame System – Morphing.	ICT based class room teaching, Group Presentation, White board

LIST OF PRACTICALS

1. To practice point plotting, line and regular figure algorithms.
2. WriteaprogramtodrawthelineusingDDAalgorithm.
3. WriteaprogramtodrawthelineusingBresenham'salgorithm.
4. WriteaprogramtodrawcircleusingBresenham'salgorithm.
5. Writeaprogramtodrawcircleusingmid-pointalgorithm.
6. Raster scan line and circle drawing algorithm.
7. To practice clipping and windowing algorithms for points, lines and polygons. 8.To practice 2-D / 3-D transformations.
9. Simple fractal representation. 10.To practice filling algorithms. 11.To create animation using Flash.

Course outcomes:

- To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
- To describe the importance of viewing and projections.
- To define the fundamentals of animation, virtual reality and its related technologies.
- To understand a typical graphics pipeline 6. To design an application with the principles of the virtual reality.

Text Book:

- Computer Graphics Principles & Practice in C by James D. Foley and Andries Van Dam and Steven K. Feiner And F. Hughes John
- Computer Graphics by Amarendra N. Sinha and Arun D. Udai
- Computer Graphics C Version by Donald Hearn & M. Pauline Baker
- Procedural Elements For Computer Graphics by David F. Rogers

Reference Book:

- Computer Graphics and Multimedia by G.S. Baluja
- Procedural Elements for Computer Graphics by David F. Rogers
- Computer Graphics Principles & Practice in C by James D. Foley and Andries Van Dam and Steven K. Feiner And F. Hughes John
- Computer Graphics by Amarendra N. Sinha and Arun D. Udai
- Computer Graphics C Version by Donald Hearn & M. Pauline Baker
- Procedural Elements For Computer Graphics by David F. Rogers
- Principles of Interactive Computer Graphics by William M. Newman & Robert F. Sproull
- Computer Graphics:Principles& Practice by James D. Foley &Andries Van Dam & Steven K. Feiner& John F. Hughes
- Computer Graphics by Donald Hearn & M. Pauline Baker

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Web Developer Graphics Designer Animator Web Designer	Able to understand the basic principles of 3-dimensional computer graphics. Able to understand the application of computer graphics concepts in the development of computer games, information visualization, and business applications.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Animation or Editing Institute Freelancing.

Principal
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Kota - Bilaspur (C.G.)

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Kota, Bilaspur (C.G.)

DR. C.V.RAMAN UNIVERSITY

KARGI ROAD, KOTA, BILASPUR (C.G.)

SEMESTER- 6th
Course: Diploma CSE
SUBJECT:Project Lab
MAJOR PROJECT

Subject Code: 2TDCS-604
Theory Max. Marks: 100
Theory Min. Marks:50

Students should devote themselves to make a project which preferably should be a working model of theirthoughts based on their subject of choice.The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the VI semester.The project shall be finalized by the students before the start of the VI semester and shall be completed andsubmitted at least one month before the last working day of the VI semester, date of which shall be notifiedin the academic calendar.

The evaluation committee shall consist of faculty members constituted by the college which would becomprised of at-least three members comprising - the Department Coordinator, Class Coordinator and aominee of the Principal. The students guide would be a special invitee to the presentation. The seminarsession shall be an open house session. The internal marks would be the average of the marks given by eachmember of the committee separately and submitted to the Principal in a sealed envelope.
Not more than three students would form a group for such industrial training/ project submission.

Job opportunity	Employability skill developed	Local/National/UNDP Goal Achieved	Entrepreneurship Opportunity
Project Implementation.	Able to understand problem solving approach.	Goal 04(Quality education) Goal 09 (FinancialgrowthInnovative)	Service consultancy.

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DR. C.V.RAMAN UNIVERSITY

KARGI ROAD, KOTA, BILASPUR (C.G.)

SEMESTER- 6th
Course: Diploma CSE
SUBJECT: Entrepreneurship and innovative Skills

Subject Code: 2TDCS-605
Theory Max. Marks:25
Theory Min. Marks:12

COURSE OBJECTIVE:

The Master of Science in Entrepreneurship programme provides you with cutting-edge knowledge and skills on how to successfully develop captivating products and services to solve challenging problems in a highly uncertain environment, often under considerable time constraints with very limited resources. You will be able to apply these skills in the context of both new ventures as well as in established companies.

Unit	Unit wise course contents	Methodology Adopted
Unit – I	Innovation: innovation- an abstract concept; creativity, innovation and imagination; types of innovation-classified according to products, processes or business organizations.	ICT based class room teaching, Group Presentations, White board
Unit – II	Entrepreneurship: who is an entrepreneur ?Entrepreneurship-A state of Mind, Emergence of entrepreneur; Role of Entrepreneur; A Doer not a Dreamer- Characteristics of an entrepreneur; Factor affecting entrepreneurial growth –Social, cultural, personality factors, psychological and Social Factors. Impact of Entrepreneurship for sustainable development.	ICT based class room teaching, Individual Presentation, White board
Unit – III	Difference between entrepreneur and entrepreneurship, Difference between entrepreneur and intra-preneur, Common Entrepreneurial competencies/Traits; Entrepreneurship stimulants, bstaclesinhibitingEntrepreneurship;Typesofentrepreneurs,Functionsofanentrepreneur.	ICT based class room teaching, Group Discussions, White board

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Syllabus:

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Kota, Bilaspur (C.G.)

Unit – IV	IdentificationofBusinessOpportChapteries:Introduction,SourcesofBusiness ofProductIdeas,StepsinIdentificationofBusinessopportChapteryanditsSWOTAnalysis.	ICT based class room teaching, White board
Unit - V	Techno-EconomicFeasibilityoftheproject:Introduction,Techno-EconomicfeasibilityoftheProject, FeasibilityReport,ConsiderationswhilepreparingaFeasibilityReport,ProformaofFeasibilityReport, RoleofInstitutionsand entrepreneurship.	ICT based class room teaching, Group Presentation, White board

Course Outcome:

- Entrepreneurship and Innovation minors will be able to sell themselves and their ideas. Students master oral and visual presentation skills and establish a foundation of confidence in the skills necessary to cause others to act.
- Entrepreneurship and Innovation minors will be able to find problems worth solving. Students advance their skills in customer development, customer validation, competitive analysis, and iteration while utilizing design thinking and process tools to evaluate in real-world problems and projects.
- Entrepreneurship and Innovation minors will be able to mobilize people and resources. Students identify and secure customers, stakeholders, and team members through networks, primary customer research, and competitive and industry analyses in order to prioritize and pursue an initial target market in real-world projects.

Text Book:

- Fundamentals of Entrepreneurship by Sangram Keshari Mohanty
- Udhyamita (Entrepreneurship) (H) by M.K. Jain
- Entrepreneurship Development by U.C. Gupta & Satish Kumar Sinha

Reference Book:

- Fundamentals of Entrepreneurship by Sangram Keshari Mohanty
- Tribe of Mentors: Short Life Advice from the Best in the World by Tim Ferriss
- Crushing It!: How Great Entrepreneurs Build Their Business and Influence-and How You Can, Too Hardcover – January 30, 2018by Gary Vaynerchuk (Author)

Job opportunity	**Employability skill developed**	**Local/National/UNDP Goal Achieved**	**Entrepreneurship Opportunity**
Business analyst Start-up consultant	Able to understandsell themselves and their ideas Able to understand to find problems worth solving.	Goal 04(Quality education)	Short business unit (retail and macro) Service consultancy

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