Programme Structure for B Tech.: First Computer Science and Engineering

Semester I: Teaching Scheme

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Th	Pr	Tu	Th	Pr	Tu	Total credits
U01BS101	Applied Mathematics I	3	-	-	3	-	-	3
U01BS001 U01BS002	Applied Chemistry OR Applied Physics	3	-	-	3	-	-	3
U01ES001 U01ES002	Engineering Mechanics OR Engineering Graphics	2	-	-	2	-	-	2
U01ES003 U01ES004	Basic Civil and Mechanical Engineering OR Basic Electrical and Electronics Engineering	3	-	-	3	-	-	3
U01BS003 U01BS004	Applied Chemistry Lab OR Applied Physics Lab	-	2	-	-	1	-	1
U01ES005 U01ES006	Engineering Mechanics Lab OR Engineering Graphics Lab	-	4	-	-	2	-	2
U01ES007 U01ES008	Basic Civil and Mechanical Engineering Lab OR Basic Electrical and Electronics Engineering Lab	-	2	-	-	1	-	1
U03AE001 U01IK002	Professional Communication OR Ancient Indian Logic from the view point of Computer Science and Engineering	2*	-	-	2	-	-	2
U01VS001 U01VS002	Workshop Practice-I:C Programming OR Workshop Practice-II: Basic Engineering Practices	-	4	-	-	2	-	2
U04CC0XX	Co-curricular Courses I	-	4	-	-	2	-	2
U03VE001	Constitution of India	2	-	-	2	-	-	2
U03VE002	Universal Human Values-I#	-	-	-				**Audit Course**
	Total	**15**	**16**	**-**	**15**	**8**	**-**	**23**

- ***Out of 2 hours, 1 hour theory shall be taught to entire class followed by 1 hrs. Practical in batches,Th: Theory, Pr: Practical, Tu: Tutorial**
- **#During the Induction Program, students would get an initial exposure to human values through Universal Human Values-I.**

Semester I: Evaluation Scheme

Course Code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				ESE	Term work	Practical Oral/POE	
		T1	T2	FET	Total				
U01BS101	Applied Mathematics I	10	10	5	25	50	-	-	75
U01BS001 U01BS002	Applied Chemistry OR Applied Physics	10	10	5	25	50	-	-	75
U01ES001 U01ES002	Engineering Mechanics OR Engineering Graphics	-	10	5	15	35	-	-	50
U01ES003 U01ES004	Basic Civil and Mechanical Engineering OR Basic Electrical and Electronics Engineering	10	10	5	25	50	-	-	75
U01BS003 U01BS004	Applied Chemistry Lab OR Applied Physics Lab	-	-	-	-	-	25	-	25
U01ES005 U01ES006	Engineering Mechanics Lab OR Engineering Graphics Lab	-	-	-	-	-	50	-	50
U01ES007 U01ES008	Basic Civil and Mechanical Engineering Lab OR Basic Electrical and Electronics Engineering Lab	-	-	-	-	-	25	-	25
U03AE001 U01IK002	Professional Communication OR Ancient Indian Logic from the view point of Computer Science and Engineering	-	10	5	15	35	-	-	50
U01VS001 U01VS002	Workshop Practice-I:C Programming OR Workshop Practice-II: Basic Engineering Practices	-	-	-	-	-	50	-	50
U04CC0XX	Co-curricular courses I	-	-	-	-	-	50	-	50
U03VE001	Constitution of India	10	-	5	15	35	-	-	50
U03VE002	Universal Human Values-I	-	-	-	-	-	-	-	**Audit Course**

- **Minimum passing is 40% for all courses and evaluation head mentioned above. FET – Faculty evaluation for Theory, T1, T2, Continuous Assessment Test, Term Work , ESE - End Semester Examination, P/F – Pass/ Fail Course, AU – Audit Course**

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS101	Applied Mathematics I	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01BS101	Applied Mathematics I	10	10	5	25	40%	50	40%	75

Course Description

This course is at first semester of first year Engineering. It is a foundation course in Mathematics and may be pre-requisites for other courses and next semester Mathematical subjects. It covers matrices, expansions of functions, partial derivatives and applications of partial derivatives.

Pre-requisites: 11^{th} and 12^{th} standard Mathematics.

Course Objectives

- To know the application of the matrix technique to find solutions of system of linear equations arising in many engineering problems.
- To know and apply the concept partial derivatives and their applications.
- To understand Computation of Jacobian of functions of several variables and their applications.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Solve**[3] simultaneous linear equations using matrix.
- **CO2** **Find**[3] Eigen values, Eigen vectors.
- **CO3** **Express**[3] functions in power of x and (x-a).
- **CO4** **Calculate**[3] the partial derivatives of a function of two or more than two variables.

Course Contents

Module	Unit	Description	Hours
1.0		**Matrices I**	**9**
1	1.1	Rank of matrix, Elementary transformation on matrices, rank of matrix, rank by normal form (canonical form) and echelon form.	
	1.2	Consistency of linear system of equations, solution of system of linear homogeneous and non-homogeneous equations.	
2.0		**Matrices II**	**9**
2	2.1	Vectors, Linear dependence and independence of vectors, properties of vectors.	
	2.2	Characteristic equation, Eigen value, properties of Eigen value, Eigen vectors, Properties of Eigen vectors.	
	2.3	Cayley Hamilton's theorem (Without proof), Power and inverse of matrix by Cayley Hamilton theorem.	
3.0		**Expansion of functions**	**9**
3	3.1	Expansion of function by Maclaurin's series, standard expansions, expansion by integration & derivative and substitution method.	
	3.2	Expansion of function by Taylor's series.	
	3.3	Limits and indeterminate forms.	
4.0		**Partial Differentiation**	**9**
4	4.1	Partial derivatives, Partial derivatives of higher order, Partial derivatives of composite functions, partial derivatives of Implicit functions.	
	4.2	Euler's theorem on homogeneous function (Without Proof).	
	4.3	Jacobians, properties of Jacobians.	
5.0		**Application of Partial Differentiation**	9
5	5.1	Error and approximation, Maxima and minima for function of two variables.	
	5.2	Differentiation under the integral sign with constant limits.	

Text Books

1. Grewal. B. S "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi, (2011)
2. Bali N. P and Manish Goyal, A Textbook of Engineering Mathematics, Eighth Edition, Laxmi Publications Pvt Ltd., (2011)

References

1. Dass, H.K., and Er. RajnishVerma, Higher Engineering Mathematics, S. Chand Private Ltd., (2011).
2. Glyn James, Advanced Modern Engineering Mathematics, 3rd Edition, Pearson Education, (2012).
3. Peter V and O'Neil, Advanced Engineering Mathematics, 7th Edition, Cengage learning, (2012).

Internal Assessment (T1, T2 and FET)

1. T1 (Test 1) should be based on first two modules and T2 (Test 2) should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS001	Applied Chemistry	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01BS001	Applied Chemistry	10	10	5	25	40%	50	40%	75

Course Description

This is foundation course in science and may be prerequisite course of other engineering courses. It covers quality parameters of water, corrosion of engineering materials, metallurgy, fuel, cell and green chemistry

Pre-requisites:

Course Objectives

- To understand the basic principles of chemistry.
- To study the applications of chemistry in various engineering disciplines
- To create an awareness of the environmental impact of engineering activities and the role of chemistry in addressing it.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Estimate**[3] water quality parameters for applications in water purification.
- **CO2** **Examine**[3] the mechanism of corrosion to prevent corrosion.
- **CO3** **Describe**[2] the significance of advanced material, process of metallurgy and alloy
- **CO4** **Explain**[2] the concepts of Fuel, cell, batteries and Electrochemistry.

Course Contents

Module	Unit	Description	Hours
1.0		**Water**	**9**
1	1.1	Introduction, impurities in natural water, water quality parameters total solids, acidity, alkalinity, chlorides, and dissolved oxygen (definition, causes, significance), hardness of water (Causes, types, units of hardness),	
	1.2	Ill effects of hard water in steam generation in boilers (Scale, Sludge & caustic embrittlement), numerical on hardness, treatment of hard water (ion exchange and reverse osmosis).	
2.0		**Corrosion and its Prevention**	**9**
2	2.1	Introduction, basic concepts (electrochemistry), causes, classification, atmospheric corrosion (oxidation corrosion), Electrochemical corrosion (hydrogen evolution and oxygen absorption mechanism), factors affecting rate of corrosion. Prevention of corrosion by proper design and material selection, hot dipping (galvanizing and tinning), Cathodic protection, metal spraying and electroplating.	
	2.2	Green Chemistry: Introduction, Need and Historical Background of Green Chemistry, Concept of Systems Thinking, Circular economy and Sustainability, Twelve principles of Green Chemistry.	
3.0		**Engineering Materials**	**9**
3	3.1	Polymers: Introduction, thermo softening and thermosetting plastics, industrially Important plastics like phenol formaldehyde, urea formaldehyde and epoxy resins, conducting Polymers (doping, conjugation, conductivity), examples and applications, biodegradable plastics.	
	3.2	Cement: Classification, Composition and manufacturing of Portland cement. Refractories: Classification and properties.	

4.0		**Metallurgy and Alloys**	**9**
4	4.1	Introduction, concepts of metals and nonmetals in periodic table, basic terms in metallurgy (mineral, ore, metallurgy). Process of extraction of metal: Concentration of ore, Ore to metaloxide, Metaloxide to metal, purification of metal.	
	4.2	Alloys: Definition, purposes of making alloys with examples. Classification of Alloys- Ferrous and nonferrous alloys	
5.0		**Fuels and Energy Source**	**9**
5	5.1	**Fuels:** Introduction, classification, calorific value, definition, units (calorie, kcal, joules, kilojoules), characteristics of good fuels, comparison between solid, liquid and gaseous fuels, types of calorific Value (higher and lower), Bomb calorimeter and Boy's calorimeter. Numerical on Bomb and Boy's calorimeter. Renewable and non-renewable sources.	
	5.2	**Energy Source:** Basic terms and types of batteries (a) Primary batteries – Lechalanche cell (dry cell) (b) Secondary batteries(Accumulators) Lead acid battery (c) Fuel cells- $H_2 – O_2$ fuel cell	

Text Books

1. S. S. Dara and S. S. Umare , A Textbook of Engineering Chemistry, S. Chand & CompanyLtd., New Delhi.
2. C. P. Murthy, C. V. Agarwal and A. Naidu, A Textbook of Engineering Chemistry, BS Publications, Hyderabad.

References

1. Jain and Jain, Engineering Chemistry, Dhanpat Rai Publishing Company Ltd., New Delhi.
2. Pendse M H, Joshi S S, Bhavsar C M, Kulkarni S D, Nirali Prakashan, Engineering Chemistry.
3. V. K. Ahluwalia, Green Chemistry, Environmentally benign Reaction ,Ane Books Pvt Ltd
4. Dr. A. K. Pahari and Dr. B. S. Chauhan, Engineering Chemistry, Laxmi Publications (P) Ltd, New Delhi.
5. B. K. Sharma, Industrial Chemistry (Including Chemical Engineering), GOEL Publishing House.

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately..

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS002	Applied Physics	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01BS002	Applied Physics	10	10	5	25	40%	50	40%	75

Course Description

This course is designed in such a way that it bridges the sciences and engineering, technology. The syllabus effectively focuses on the concepts needed for first year technology students for their further technological studies.

Pre-requisites

- Basic knowledge about Sound, Ultrasonic sound and their properties.
- Knowledge Electromagnetic spectrum
- Idea about interference, diffraction and polarisation etc.
- Basic of magnetism and different phases of matter.

Course Objectives:

- To introduce students to the basic principles of Ultrasonic's and acoustics and its application.
- To study in details the concepts of interference, diffraction and polarisation and to study their applications.
- To provide students with the basic knowledge of quantum physics .
- To prepare students for further studies in related fields.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Discuss**[2]The basic theory and principles of production of ultrasonic sound and acoustics.
- **CO2** **Explain**[3] Properties and applications of electromagnetic waves in engineering, LASER technology and fiber optics and their applications.
- **CO3** **Understand**[2] and **Explain**[3]Particle nature of light and basic of quantum mechanics.
- **CO4** **Apply**[4]Knowledge of magnetism and crystallography in Engineering field.

Course Contents

Module	Unit	Description	Hours
1.0		**Ultrasonic and Acoustics**	**9**
1	1.1	Introduction, production of ultrasonic waves by Piezoelectric and Magnetostriction method (Using transistor circuit), properties of ultrasonic waves, determination of wavelength and velocity of ultrasonic waves, application of ultrasonic waves.	
	1.2	Acoustics: Introduction, Basic requirements for acoustically good hall, reverberation, time of reverberation, Sabine's formula (No derivation), absorption coefficient, factors affecting architectural acoustics and their remedies, Numerical.	
2.0		**Properties and Applications of Electromagnetic Waves**	**9**
2	2.1	Properties of Electromagnetic Waves: Interference, diffraction, double refraction and polarization.	
	2.2	Applications of Electromagnetic Waves: Applications of microwave and radio waves, Infrared rays, Ultraviolet rays, X-rays and gamma rays.	
3.0		**Laser and Fibre Optics:**	**9**
3	3.1	Laser Basic process and Lasing action (metastable state, population inversion), Applications communication in space, medical and industry.	
	3.2	Fiber optics: Structure and principle, types of optical fibers, Applications-medical applications / communication.	
4.0		**Quantum Mechanics**	**9**
4	4.1	Development of Quantum theory, wave-particle duality, de-Broglie hypothesis, matter waves, different forms of matter wave.	
	4.2	Heisenberg's Uncertainty principle, Photoelectric and Compton effect, Numerical.	

5.0		**Magnetic Materials and Crystal Physics**	**9**
5	5.1	Origin of magnetic moment, magnetic properties of materials, Magnetic susceptibility, Classification of diamagnetic, paramagnetic and ferromagnetic materials, Ferromagnetic domains, Hysteresis in ferromagnetic materials, Soft and Hard magnetic materials, applications of magnetic materials	
	5.2	**Crystal Physics:** Introduction to basic concepts, Bravais Lattices, Properties of Crystal symmetry elements of a cubic crystal, Miller Indices.	
	5.3	X-ray diffraction: Bragg's law and powder method.	

Text Books

1. A. K. Jha, A Textbook of Applied Physics, Volume 1, I. K. International Pvt Ltd,2009.
2. R.Balasubramaniam, Callister's Materials Science and Engineering, Wiley (Indian Edition),2014.
3. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw Hill Education (Indian Edition), 2020.
4. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019.

References

1. Mehta Neeraj, Applied Physics for Engineers, PHI Learning Pvt. Ltd.,2011.
2. Paul E. Tippens, Applied Physics, Gregg Division McGraw-Hill Book Co.,1985.

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES001	Engineering Mechanics	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01ES001	Engineering Mechanics	-	10	5	15	40%	35	40%	50

Course Description

Engineering Mechanics is a subject that deals with the principles, calculations, and laws of Forces; along with their applications to Mechanical Engineering problems. Engineering Mechanics is used to solving real-life designing, analyzing, and constructing things.

Pre-requisites: -

Course Objectives

- Understand the force systems and draw free body diagram to analyze rigid body equilibrium
- Compute the centroid, first moment and second moment of an area
- Understand the concept of motion of particles and rigid bodies.
- Explain different energy principles of mechanics

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Determine**[1] the Resultant of Concurrent and Non-Concurrent Force System
- **CO2** **Analysis**[3] of Structures for a given force system to determine Moment of Inertia
- **CO3** **Demonstrate**[3] the concept of Kinetics and Kinematics of a particle
- **CO4** **Illustrate**[3] Principles of Work and Energy and Principle of Impulse and Momentum

Course Contents

Module	Unit	Description	Hours
1.0		**Fundamental Concepts and Principles of Mechanics**	**6**
1	1.1	Newton's Laws of Motion, Forces on Particle, Systems of 2D forces**,** Resolution, Composition and Resultant of Concurrent Forces	
	1.2	Law of Parallelogram of Forces, Equilibrium of a Particle, Lami's Theorem, Free-Body Diagrams	
2.0		**Moment of a Force**	**6**
2	2.1	Moment, Couple, Equilibrium of 2D Rigid Bodies, Resultant of Non-Concurrent Force System	
	2.2	Moment, Couple, Equilibrium of 2D Rigid Bodies, Resultant of Non-Concurrent Force System	
3.0		**Centroids and Moment of Inertia and Non-liner motion**	**6**
3	3.1	Centre of Gravity of a 2D Body, 2.Centroids of Areas and Lines, Composite Plates	
	3.2	Moment of Inertia, of an Areas, Polar Moment of Inertia, Radius of Gyration of an AreaParallel-Axis Theorem, Perpendicular Axis Theorem, Moments of Inertia of Composite Areas	
4.0		**Kinematics and Dynamics of Motion**	**6**
4	4.1	Introduction to Kinematics of Linear motion (no numerical on kinematics), Kinetics of linear motion, Newton's Laws, D'Alembert's Principle, Work- Energy Principle, Impulse Momentum Principle.	
	4.2	Rectilinear Motion of Particles, Dependent Motion of Particles, Curvilinear Motion of ParticlesRelative Motion, Projectile Motion, Linear Momentum of a Particle, Dynamic Equilibrium,Equations of Motion in Terms of Radial and Transverse Components, Kepler's Laws of Planetary Motion. Work of a Force, Kinetic Energy of a Particle.	

5.0		**Principle of Work and Energy**	**6**
5	5.1	Applications of the Principle of Work and Energy, Power and Efficiency, Potential Energy Conservative Forces, Conservation of Energy Motion under a Conservative Central Force.	
	5.2	Principle of Impulse and Momentum, Impulsive Motion, Impact, Direct Central Impact, Oblique Central Impact.	

Text Books

1. Beer &Johnston, Engineering Mechanics, Tata McGraw Hill.

References

1. Timoshenko and Young, Engineering Mechanics, Third Edition, McGraw Hill Publishers,2006.
2. J.L.Meriam and L.G. Kraige, Engineering Mechanics, Seventh Edition, John Wiley & Sons, 2012.
3. Gere and Timoshenko, Mechanics of Materials, Second Edition, CBS Publishers, 2011.

Internal Assessment (T1, T2 and FET)

1. T2 should be based on First to Fourth modules, for 10 marks.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES002	Engineering Graphics	02	--	-	02	--	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01ES002	Engineering Graphics	-	10	5	15	40%	35	40%	50

Course Description

This course aims to make students conversant with methods of engineering drawing and to learn CAD software so that they could draw and make best use of it in drawing of engineering graphics.

Pre-requisites: Knowledge of Steel Rule, Set-squares & Protractor.

Course Objectives

- To improve imagination skills.
- Increase ability to communicate with people through drawings.
- Train to interpret data and transform into graphical representation.
- Prepare the student for future Engineering positions.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Draw**[2] the technical drawing following all BIS conventions
- **CO2** **Apply**[3] orthographic projection method to obtain multiview, auxiliary view and sectional views
- **CO3** **Draw**[2] Isometric view from the front views, top views and/or side views.
- **CO4** **Represent & Demonstrate**[1] technical drawings

Course Contents

Module	Unit	Description	Hours
1.0		**Fundamentals of Engineering Graphics**	**6**
1	1.1	Different types of lines and material conventions used in drawing practice.	
	1.2	Dimensioning system as per BIS (Theoretical treatment only)	
2.0		**Projections of Lines & Planes**	**6**
2	2.1	Introduction to First angle and third angle methods of projection.	
	2.2	Projection of points, Projections of lines on regular, horizontal and frontal planes.	
3.0		**Orthographic Projections**	**6**
3	3.1	Lines used, Selection of views, spacing of views, dimensioning.	
	3.2	Drawing required views from given pictorial views (Conversion of pictorial view into orthographic view)	
4.0		**Orthographic Sectional Views**	**6**
4	4.1	Drawing required views from given pictorial views including sectional orthographic view	
	4.2	Drawing required views from given pictorial views including sectional orthographic view	
5.0		**Isometric projections**	**6**
5	5.1	Introduction to isometric, Isometric scale.	
	5.2	Isometric projections and Isometric views / drawings.	
	5.3	Circles in isometric view. Isometric views of simple solids and objects	

Text Books

1. N. D. Bhatt, Engineering Drawing, Charotor Publication House, Bombay
2. W. J. Luzadder, Fundamentals of Engineering Drawing, Prentice Hall of India.

References

1. Jon M.Duff, William A. Ross, Engineering Design and Visualization, CENGAGE Learning.
2. N. D. Bhatt, Machine Drawing, Charotor Publication House, Bombay.
3. French and Vierck, Graphic Science, Mc-Graw Hill International.
4. K. Venugopal, Engineering Drawing and Graphics, New Age Publication.

Internal Assessment (T1, T2 and FET)

1. T2 should be based on First to Fourth modules, for 10 marks.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES003	Basic Civil and Mechanical Engineering	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01ES003	Basic Civil and Mechanical Engineering	10	10	5	25	40%	50	40%	75

Course Description

This course deals about basic Civil Engineering and Mechanical Engineering**.** The course helps students identify the fundamentals of Civil Engineering and mechanical Engineering related to building planning, bye plans, manufacturing process.

Pre-requisites: -

Course Objectives

- Understand concept of planning and bye laws
- Compute various levels of surveying by different methods of leveling
- Explain the energy transformation processes and power plants
- Understand classification of manufacturing processes

Course Outcomes: After the successful completion of the course students will able to:

- **CO1: Ápply**[3] Principals of Planning and Bye Laws practically
- **CO2: Evaluate**[2] various levels of surveying by different methods of levelling
- **CO3: Classify**[2] Energy Sources and Mechanical Power Transmission devices.
- **CO4: Suggest**[2] suitable manufacturing processes for different applications.

Course Contents

Module	Unit	Description	Hours
1.0		**Relevance of Civil Engineering and Building Planning**	**9**
1	1.1	Introduction, branches of civil engineering, application of civil engineering in other allied fields.	
	1.2	Introduction to types of loads, load bearing and framed structures.	
2.0		**Components of Building**	**9**
2	2.1	Elements of sub-structures and their functions, types of foundations and their suitability	
	2.2	Elements of super-structures and their functions	
3.0		**Principles of planning & Bye-Laws and Surveying**	**9**
3	3.1	Principles of planning, introduction to Bye-Laws related to BUA, FSI etc. Principles of surveying, bearing and its types, system of bearing, Levelling,	
	3.2	Terms used in levelling, types of levelling	
4.0		**Introduction to Energy Sources and its conversion**	**9**
4	4.1	Energy sources: Renewable and Non-renewable Energy Sources, Hydropower energy, nuclear energy, Steam Power Plant, Solar energy, Geothermal energy, Wind energy, Tidal energy,	
	4.2	Introduction of pump, compressor, turbines. Power Transmission Devices: Gears, Belt-Pulley, Rope Drives, Chain-Sprocket	
5.0		**Introduction to Manufacturing Processes**	**9**
5	5.1	Types of manufacturing Processes, Casting, Material Removal Processes Metal forming: Rolling, Drawing, Extrusion, Forging, Sheet metal working Introduction to Welding	
	5.2	Introduction to Automation and Robotics in industry	

Text Books

1. Arora S.P. and Bindra S.P., Basic Civil and Mechanical Engineering, Dhanpat Rai and Sons, New Delhi 1997.
2. G.D. Rai, Non-Conventional Sources of Energy, Khanna Publication

References

1. Shanmugam, G, and Palanichamy, Building Construction, Planning Techniques and Method of Construction, Tata McGraw Hill Publishing Co., New Delhi, 1996
2. P. N. Rao, Manufacturing Technology -Volume I and II, Tata Mc-Graw Hill

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES004	Basic Electrical and Electronics Engineering	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01ES004	Basic Electrical and Electronics Engineering	10	10	5	25	40%	50	40%	75

Course Description

This course provides an introduction towards the fundamental principles and concepts of Electrical and Electronics engineering. It is designed to provide a solid foundation to the students who are pursuing Engineering degree in various disciplines as a beginner.

Pre-requisites: Knowledge of Physics and Mathematics in Secondary Education

Course Objectives:

- To impart the basic terminology and definitions of Electrical and Electronics engineering
- To study various laws to evaluate the performance of components in the circuits
- To acquire the basic knowledge of analog and digital devices and its functioning
- To study different number system conversions and logic gates
- To acquire the basic knowledge and operations of measuring instruments

Course Outcomes: After the Successful completion of the course students will able to:

- **CO1: Explain**[2] basic components in Electric and Magnetic Circuits.
- **CO2: Describe**[2] basic laws suitable for Electrical applications.
- **CO3: Analyse**[2] basic switches and their characteristics.
- **CO4: Interpret**[2] number systems and logical operation for Electronics circuits.
- **CO5:Explain**[2] the operation of measuring instruments and applications.

Course Contents

Module	Unit	Description	Hours
1.0		**Fundamentals and Magnetic Circuits**	**9**
1	1.1	Concept of E.M.F, Potential Difference, Current, Resistance, Resistivity and Conductivity Types of Elements: Resistance, Inductance and Capacitance. Voltage, current and power of each element, Independent and Dependent current and voltage sources, Source transformation	
	1.2	Magnetic Circuits: Concept of mmf, reluctance, magnetic flux, Magnetic Flux density, Magnetic field strength, BH curve, magnetic leakage, fringing, Comparison of Electric and Magnetic circuit and types of magnetic circuits	
2.0		**DC & AC Circuit**	**9**
2	2.1	Ohms Law, Applications of Kirchhoff's laws: KVL & KCL. Series & Parallel connection and reduction.	
	2.2	Fundamentals of Alternating quantities, Faraday's Law, Types of Induced E.M.F, Generation of sinusoidal voltage, concept of R.M.S. & Average value, form factor, Peak Factor, Pure Resistive, Inductive, Capacitive, R-L, R-C, R-L-C series circuits, powers, Significance of power factor. Laws of electromagnetic induction, Concept of self and mutual induction, Generation of single-phase and three phase sinusoidal voltage.	
3.0		**Semiconductor Devices**	**9**
3	3.1	Conductors, Insulators & Semiconductors, PN-Junction diode-Operation and Characteristics, Zener Diodes-Operation and Characteristics	
	3.2	Bipolar Junction Transistor: Construction, operation and characteristics of NPN and PNP Transistors, Input and Output characteristics of CB and CE Configuration. Relation between α , β and γ	
4.0		**Number Systems and Logic Gates**	**9**
4	4.1	Introduction to number system: binary, octal, decimal, hexadecimal. Inter conversion between number systems, Binary coded decimal (BCD) number.	
	4.2	Basic gates-AND, OR, NOT, X-OR, X-NOR with truth table, Universal gates: NAND & NOR with truth table, Design of basic logic gates by using universal gates.	

5.0		Measuring Instruments	9
5	5.1	Introduction to Voltmeter, Power meter, Ammeter, Ohm-meter, Digital Multimeter	
	5.2	Cathode Ray Oscilloscope- Block diagram, Measurement of voltage and frequency, Signal Generator, Digital Multimeter-Block diagram and its operation.	

Text Books

1. Nagrath I.J. and D. P. Kothari, "Basic Electrical Engineering", TMH Publication, 3rdEdition, 2010.
2. Ashfaq Husain, "Fundamentals of Electrical Engineering" Dhanpat Rai & Company, 4thEdition, 2011.
3. Anand Kumar, "Fundamentals of Digital Circuits" PHI Publication, 4th edition, 2017.
4. R. P. Jain, "Modern Digital Electronics", TMH Publication, 4th edition, 2010

References

1. B.L & A.K. Theraja, "Electrical Technology", Vol-II, S. Chand McGraw Hill Publication, 4thEdition, 2011.
2. N Salivanan & Sureshkumar, Electronic Devices & Circuits, Tata Mc-GrawHill.
3. Anil K. Maini, "Digital Electronics Principles and Integrated Circuits" Wiley Publications, 2007.

Internal Assessment (T1, T2 and FET):

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each. T1 and T2 can be Test/ Presentation/Any other formative assessment .
2. FET shall be assessed for 5 marks separately.

End Semester Examination:

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS003	Applied Chemistry Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term work	Min pass	Marks	Min pass	Total (Marks)
U01BS003	Applied Chemistry Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Estimate**[3] the parameters and mechanism of material used in engineering applications.
- **CO2** **Prepare**[3] the basic material used in engineering applications.

List of Experiments

All the experiments will be based on the course content of **Applied Chemistry U01BS001**

References

1. Jain and Jain, Engineering Chemistry, Dhanpat Rai Publishing Company Ltd., New Delhi.
2. Pendse M H, Joshi S S, Bhavsar C M, Kulkarni S D, Nirali Prakashan, Engineering Chemistry.
3. V. K. Ahluwalia, Green Chemistry, Environmentally benign Reaction ,Ane Books Pvt Ltd
4. Dr. A. K. Pahari and Dr. B. S. Chauhan, Engineering Chemistry, Laxmi Publications (P) Ltd, New Delhi.

Evaluation Scheme

1. TERM WORK assessment shall be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS004	Applied Physics Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01BS004	Applied Physics Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Develop**[2] practical skills with proper handling and selection of instruments.
- **CO2** **Understand**[1] basic theoretical concepts and properties of light and LASER.
- **CO3** **Understand**[1] hysteresis and crystal structures.

List of Experiments

All the experiments will be based on the course content of **Applied Physics – U01BS002**

References

1. Mehta Neeraj, Applied Physics for Engineers, PHI Learning Pvt. Ltd.,2011.
2. Paul E. Tippens, Applied Physics, Gregg Division McGraw-Hill Book Co.,1985.

Evaluation Scheme:

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES005	Engineering Mechanics Lab	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01ES005	Engineering Mechanics Lab	50	40%	-	-	50

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Perform**[2] experiment related to the Resultant of Concurrent and Non-Concurrent Force System
- **CO2** **Determine**[3] resultant of given force system to determine Moment of Inertia
- **CO3** **Illustrate**[3] Principles of Work and Energy and Principle of Impulse and Momentum

List of Experiments

All the experiments will be based on the course content of **Engineering Mechanics – U01ES001**

References

1. Timoshenko and Young, Engineering Mechanics, Third Edition, McGraw Hill Publishers,2006.
2. J.L.Meriam and L.G. Kraige, Engineering Mechanics, Seventh Edition, John Wiley & Sons, 2012.
3. Gere and Timoshenko, Mechanics of Materials, Second Edition, CBS Publishers, 2011.

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment done on computer graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES006	Engineering Graphics Lab	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01ES006	Engineering Graphics Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Develop** [3] isometric drawings of simple objects reading the orthographic projections of those objects.
- **CO2** **Design** [4] 3D objects with isometric principles by using computer aided sketches
- **CO3** **Produce**[2] geometric construction, dimensioning and detail drawings.

List of Experiments

All the experiments will be based on the course content of **Engineering Graphics – U01ES002**

References

1. Jon M.Duff,William, A. Ross, Engineering Design and Visualization , CENGAGE Learning
2. N. D. Bhatt, Machine Drawing , Charotor Publication House, Bombay.
3. French and Vierck, Graphic Science, Mc-Graw Hill International
4. K. Venugopal, Engineering Drawing and Graphics, New Age Publication

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment done on computer graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES007	Basic Civil and Mechanical Engineering Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01ES007	Basic Civil and Mechanical Engineering Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Plot**[2] outline of the building
- **CO2** **Measurement**[1] of horizontal angle by prismatic compass
- **CO3** **Explain**[2] the principle of working of Various mechanical systems

List of Experiments

All the experiments will be based on the course content of Engineering Graphics – U01ES003

References

1. Shanmugam, G, and Palanichamy, Building Construction, Planning Techniques and Method of Construction, Tata McGraw Hill Publishing Co., New Delhi, 1996
2. P. N. Rao, Manufacturing Technology Volume I and II, Tata Mc-Graw Hill

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES008	Basic Electrical and Electronics Engineering Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01ES008	Basic Electrical and Electronics Engineering Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:Analyze[4]** the different basic laws and types of circuits
- **CO2:Deomonstrate[2]** number systems and digital logic gates.
- **CO3: Explain[2]** the operation of basic electronic switches and gates

List of Experiments

All the experiments will be based on the course content of **Basic Electrical and Electronics Engineering – U01ES004**

References

1. B.L & A.K. Theraja, "Electrical Technology", Vol-II, S. Chand McGraw Hill Publication, 4thEdition, 2011.
2. N Salivanan & Sureshkumar, Electronic Devices & Circuits, Tata Mc-GrawHill.
3. Anil K. Maini, "Digital Electronics Principles and Integrated Circuits" Wiley Publications, 2007.

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

*****

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U03AE001	Professional Communication	02*	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U03AE001	Professional Communication	-	10	5	15	40%	35	40%	50

***Out of 2 hours, 1 hour theory shall be taught to entire class followed by 1 hrs, Practical in batches**

Course Description

This subject is designed to develop Communication and soft skills required in professional life. The students will learn these essential professional skills that will help them in academia and professional life.

Pre-requisites: - Basic LSRW skills acquaintance.

Course Objectives

- Understand concept of Communication skills
- Recognize the importance of LSRW skills
- Understand the importance of application of behavioral at various situations
- Identify Career Skills

Course Outcomes: After the successful completion of the course students will able to:

- **CO1: Identify** importance of communication in formal situations.
- **CO2: Apply** Language Skills (LSRW) effectively
- **CO3: Apply** Behavioural Skills in real life situations
- **CO4: Exhibit** career skills

Course Contents

Module	Unit	Description	Hours
1.0		**Communication Theory**	**6**
1	1.1	Communication: Concept and Its Meaning, Process, Types: Verbal and Non-verbal Communication, Levels and Networks of Communication: Formal and Informal, Flows of Communication, Barriers to Communication, ways to overcome different barriers, Communication in Crisis, Technology and Recent Trends in Communication.	
	1.2	Parts of speech, Vocabulary Building, Use of Body Language in Communication and Grooming,	
2.0		**Listening and Speaking Skills**	**6**
2	2.1	Importance of Listening, Listening and Hearing, Barriers to Effective Listening. Types of Listening, Techniques of Effective Listening,	
	2.2	Situational Conversations: Greetings, Introduction and Meeting People, Public Speaking and Presentation Skills	
3.0		**Reading and Writing Skills**	**6**
3	3.1	Types of Reading, Techniques for Effective Reading-SQ3R, Reading Comprehension	
	3.2	Business Correspondence: Seven C's in Business Letter, Types of Business Letters and Emails, Notices, Agenda, Minutes, Circulars, Memos and Report Writing, Employment Communication	
4.0		**Behavioural Skills**	**6**
4	4.1	Self Analysis tools and Techniques, SWOC Analysis, Attitude Building/ Developing Positive attitude	
	4.2	Problem Solving, Decision Making, Goal Setting, Time Management, Team Building, Team Work and Leadership.	
5.0		**Career Skills**	**6**
5	5.1	Applying for Job, Resume Building, Interview: Techniques & skills, Group Discussion, E-Portfolio	
	5.2	Planning and Managing Career Office Etiquettes.	

Text Books

1. Chadha, R.K., Communication Techniques and Skills, Dhanpat Rai Publications, New Delhi.
2. Raymond Murphy, Essential English Grammar: A Self-Study Reference and Practice Bookfor Elementary Students of English with Answers, Cambridge University Press
3. Green, David. Contemporary English Grammar–Structures and Composition.MacMillan India. 2014 (Print)
4. Fitikides, T. J. Common Mistakes in English. London: Orient Longman, 1984

References

1. Ashraf Rizvi, Effective Technical Communication, Tata McGraw-Hill.
2. Thomas N. Huckin& Leslie A. Olsen, Technical Writing & Professional Communication for non-native speakers of English, McGraw –Hill.
3. Nicky Stanton, Mastering Communication by, Palgrave Master Series
4. Meenakshi Raman & Sangita Sharma, Technical Communication; Principles and Practice, Oxford University Press.
5. M Ashraf Rizvi, Effective Technical Communication, Tata McGraw-Hill Education
6. Martin Hewings, Advanced Grammar in Use, Cambridge University Press, 2013

Internal Assessment (T1, T2 and FET)

1. T2 should be based on first to fourth modules for 10 marks.
2. Fifth module will be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01IK002	Ancient Indian Logic from the view point of Computer Science and Engineering	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01IK002	Ancient Indian Logic from the view point of Computer Science and Engineering	-	10	5	15	40%	35	40%	50

Course Description

This course provides an in-depth exploration of the foundational principles and systems of Ancient Indian Logic, with a focus on the Nyaya and Vaisheshika schools, as well as insights into Buddhist and Jaina perspectives. Students will delve into the rich philosophical traditions that shaped the discourse on epistemology, ontology, and logical reasoning in ancient India..

Pre-requisites: Computer Basics

Course Objectives

- Understanding Philosophical Foundations.
- Investigate key categories such as Padartha and the Nyaya theory of causation
- Introduce the unique epistemological stance of Buddhist philosophy.
- Compare Jaina logic with Nyaya, Vaisheshika, and Buddhist logical systems

Course Outcomes: After the end of this course students will be able to

- **CO1** **Identify**[1] major figures and schools associated with Ancient Indian Logic.
- **CO2** **Describe**[2] the metaphysical principles and categories of the Vaisheshika system.
- **CO3** **Apply**[3] the Nyaya syllogism in constructing logical arguments.
- **CO4** **Conduct**[4] a comparative analysis of Jaina logic with Nyaya, Vaisheshika, and Buddhist logical systems.

Course Contents

Module	Unit	Description	Hours
1.0		**Foundations of Ancient Indian Logic**	**6**
1	1.1	Overview of Ancient Indian Philosophy. Introduction to Nyaya and Vaisheshika Schools , Basic concepts in Indian Logic: Pramana, Prameya, etc.	
	1.2	Evolution of Nyaya and Vaisheshika Systems. Key Figures: Gautama, Kanada, etc. Readings: Relevant portions from Nyaya Sutras, Vaisheshika Sutras	
2.0		**Nyaya System**	**6**
2	2.1	Nyaya Epistemology and Ontology The Nyaya Syllogism (Anumana) Nyaya Categories: Padartha	
	2.2	Nyaya Theory of Causation Nyaya Logic and Language Readings: Selections from Nyaya Shastra	
3.0		**Vaisheshika System**	**6**
3	3.1	Vaisheshika Metaphysics Vaisheshika Categories: Dravya, Guna, Karma, etc. Vaisheshika Atomism	
	3.2	Vaisheshika Theory of Causation Vaisheshika and Perception Readings: Relevant portions from Vaisheshika Sutras	
4.0		**Buddhist Logic**	**6**
4	4.1	Introduction to Buddhist Philosophy Buddhist Epistemology: Pramana Abhidharma and the Analysis of Dharmas.	
	4.2	Buddhist Syllogism and Inference Comparison with Nyaya and Vaisheshika Readings: Selected texts from Abhidharma	
5.0		**Jaina Logic**	**6**
5	5.1	Overview of Jain Philosophy Jaina Theory of Reality (Syadvada) Jaina Logic and Sevenfold Predication (Saptabhanginaya).	
	5.2	Comparison with Nyaya and Buddhist Logic Readings: Relevant portions from Jain Agamas	

Text Books

1. Indian Philosophy: A Very Short Introduction" by Sue Hamilton Publisher: Oxford University Press ISBN-13: 978-0192853745
2. Classical Indian Philosophy: An Introductory Text" by J.N. Mohanty Publisher: Rowman & Littlefield ISBN-13: 978-0847689335

References

1. Indian Philosophy: An Introduction" by Roy W. Perrett. Publisher: Routledge ISBN-13: 978-0367336541
2. Indian Logic in its Sources: On Validity of Inference" by Bimal Krishna Matilal Publisher: Oxford University Press ISBN-13: 978-0198244142

Internal Assessment (T1, T2 and FET)

3. T2 should be based on first to fourth modules for 10 marks.
4. Fifth module will be assessed for 5 marks separately.

End Semester Examination

6. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks.
7. The duration of end semester examination shall be Two hours.
8. The students need to solve all 5 questions.
9. Question No.1 will be compulsory and based on entire syllabus.
10. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
U01VS001	Workshop Practice-I: C Programming	Theory	Practical	Tutorial	Theory	Practical	Tutorial
		-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
U01VS001	Workshop Practice-I: C Programming	Term Work	Min pass	Marks	Min pass	Total (Marks)
		50	40%	-	-	50

Course Description

The C programming language is a general-purpose, operating system-agnostic, and procedural language that supports structured programming and provides low-level access to the system memory

Course objectives

- Understand basics and fundamentals of C
- Understand the basics of file handling mechanisms

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Understand**[2] basic of programming language
- **CO2** **Demonstrate**[3] use of array and functions in c language
- **CO3** **Implement**[2] the algorithms for solving different problems

List of Experiments

- Program to illustrate Primitive Data types, variables, constants and expressions
- Program to illustrate Control Structures Program
- Write a program to design an arithmetic calculator using Switch-Case
- Program to illustrate String functions
- Write a program to find the number of vowels, consonants, digits in a string
- Write a program to calculate length of a String.
- Write a program to find the frequency of characters in a string.
- Write a program to find largest and smallest elements in an array.
- Write a program to copy an array to another array in reverse

- Write a program to concatenate arrays
- Write a Program to perform different Matrix Operations by using arrays
- Write a program to find a factorial of a number using functions
- Write a Program to calculate Area & perimeter of rectangle using function
- Write a Program o perform linear search using functions
- Write a Program to check whether a number can ne expressed as sum of two prime numbers
- Write a Program to Calculate Power using recursion
- Write a program to declare a structure 'Student' with name, age and marks of threesubjects as parameters. Compute the average of marks of 10 students.
- Write a program to perform addition of two numbers using command line arguments.
- Write a Program to pass the arrays and structure to the function.
- Write a Program to calculate the factorial value by using recursion.
- Write a Program to capitalize first letter of every word in a file.
- Write a Program to compare two strings using pointers
- Write a Program to find the sum of all matrix elements using pointers
- Write a Program to sort numbers in ascending order using pointers
- Write a Program to print number of lines of a file
- Write a Program to read Content of a file using getc ()
- Write a Program to capitalize the first letter of every word in a file
- Write a program to input the student data and perform the following operations by using structure and file handling concepts: Read from File, Write Data to File, Update the input data and delete the any asked student record:

Text Books

1. Kernighan Brain,The C Programming Language, Pearson Publication, 2nd Edition
2. Grey perry, C Programming Absolute beginner's guide, Que publication, 3rd Edition

References

1. Herbert Schildt, C the Complete Reference, Tata Mc-Graw Hills, 6th Editions.
2. Yashavant Kanetkar, Let us C, BPB Publication, 2007-7th Edition

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
U01VS002	Workshop Practice-II: Basic Engineering Practices	Theory	Practical	Tutorial	Theory	Practical	Tutorial
		-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
U01VS002	Workshop Practice-II: Basic Engineering Practices	Term Work	Min pass	Marks	Min pass	Total (Marks)
		50	40%	-	-	50

Course Description

This is a mainly practical course aimed to improve your career prospects within mechanical, manufacture or systems related areas within engineering.

Course objectives

- Understand the basic principles of mechanical engineering
- Demonstrate the techniques of smithy, carpentry in workshop.
- Demonstrate different techniques of welding and other processes in workshop.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Acquire**[2] skills in basic engineering practices (Use of different types of machines, tools and equipment)
- **CO2** **Develop**[2] sheet metal, carpentry model, smithy, plumbing for specific applications.
- **CO3** **Practice**[3] fitting operation and able to produce assembly of two work pieces
- **CO4** **Perform**[2] different joining operations on metal.

List of Experiments

- Demonstration of different operation performed in smithy to make model like Hook.
- Demonstration of different sheet metal operations useful for sheet metal objects like tray etc and to make one simple job of sheet metal like tray, cover etc.
- Demonstration of different fitting operations and to make one job of fitting like marking, cutting, drilling, tapping, filing, fitting operations.
- Demonstration of different joining process (Spot, arc welding) for metals and to make one job of Arc welding like lap joint, butt joint and tee joint, corner joint in flat position.
- Demonstration of different carpentry operations with the help of hand tools and power tools.
- Site visit and its report.

Text Books

1. B. S. Raghuvanshi, A Course in Workshop Technology, Vol – I, Dhanapat Rai and Sons.
2. Hajara Chaudhari, Elements of Workshop Technology, Vol –I, Media Promoters.
3. Gupta and Kaushik, Workshop Technology, Vol – I, New Heights.

References

1. Chapman, Workshop Technology, Vol – I, The English Language Book Society.
2. H.S. Bawa Workshop Technology, Vol.-I by, TMH Publications, New Delhi.
3. P. M. Agrawal, Dr. V. J. Patel**,** CNC Fundamentals and Programming

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC001	National Cadet Corps (NCC)	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC001	National Cadet Corps (NCC)	50	40%	-	-	50

Course Description

This course provides exposure to the cadets in a wide range of activities. With a distinct emphasis on Social Services, Discipline and Adventure Training.

Pre-requisites:

- To study this course, a student must be medically fit.
- It is open for all.

Course Objectives

- Practicing the students and informing them about the legendary drills
- Students motivate a good citizen of India.
- Students awareness of National Unity and Integration
- Understand the importance of a weapon its detailed safety precautions necessarycfor prevention of accidents.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1: Practice**[1] togetherness in all walks of their life.
- **CO2: Perform**[2] foot drill and follow the different word of command
- **CO3: Think**[1] critically about different life related issues .

Suggestive List of Activities

- Introduction and General information about NCC
- National Integration & Awareness
- Drill
- Weapon Training (WT)
- Personality Development and Leadership.
- Disaster Management
- Social Awareness and Community Development
- Health & Hygiene
- Adventure Training
- Environment Awareness and Conservation

Text Books

1. Maliwal, B. N., (2015) Practical Military Science , Bareli , Prakash Book Depo.
2. Chauhan, Rajeev,kumar,(2021) NCC National Cadet Corps, Gwalior, Aakruti Publication.
3. NCC Directorate MP, CG,(2018) Cadet Hand book, Itawa, NCC Directorate MP, CG.
4. Mitra, Barun, K.,(2020) Personality Development and soft skills, Oxford University Press India.
5. Goyal, Hariom, (2016) Personality Development, Kalpana Publication.

References

1. Popil, Harvinder, and Sharma, Nirmal, (2018) Emergency First Aid Safety oriented, CRS Publishers.
2. Jain, N.C., and Sookshi, (2015) First Aid and Emergency case, AITBS Publishers.

Evaluation Scheme

Sr. No.	Activity	Marks
1	Attendance Mark	40
2	Social activity	10
	Total	50

1. A cadet should be awarded 40 marks if he attends 100% of the parades. Marks should be awarded on the basis of following formula for awarding attendance marks.

$$\frac{\text{Parades Actually Attended x Total Attendance Points}}{\text{Total number of parades}} = \text{Attendance Marks}$$

$$Example: \frac{30 \times 40}{30} = 40$$

2. Participation in social work ex. For participation in social activity/ work as per instructions of Company Commanding Officer besides cleanliness of college premises, plantation of trees, traffic control, blood donation participation of cadet should be given marks out of 10.
3. Final Marking is to be done out of 50 Marks.
   (Attendance Marks (40) + Social Work Marks (10) = 50 Total Marks).
4. The Duration of One Practical Period will be 02.00 clock Hours.

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Course code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC002	National Service Scheme (NSS)	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC002	National Service Scheme (NSS)	50	40%	-	-	50

Course Description

This course provides an extension dimension to the higher education system to orient the student youth to community service while they are studying in educational institutions.

Pre-requisites:

- To study this course, a student must be medically fit.
- It is open for all.

Course Objectives

- Develop among them a sense of social and civic responsibility.
- Utilize their knowledge in finding practical solutions to individual and community problems.
- Develop competence required for group-living and sharing of responsibilities.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:** **Identify**[1] and solve the major social and environmental issues/challenges and equip the classroom learning to face those challenges.
- **CO2:** **Develop**[2] teacher competence, sensitivity and teacher motivation.
- **CO3:** **Perform**[1] NSS regular activities

List of Activities

- Introduction to National Service Scheme
- Introduction to National Integration
- Special Programme
  - Legal awareness
  - Health awareness
  - First-aid
  - Career guidance
  - Leadership training - cum - Cultural Programme
  - Globalization and its Economic Social Political and Cultural impacts.
- Special Camping programme
  - Nature and its objectives
  - Selection of camp site and physical arrangement
  - Organization of N.S.S. camp through various committees and discipline in the camp.
  - Activities to be undertaken during the N.S.S. camp.
  - Use of the mass media in the N.S.S. activities.
- N.S.S. Regular Activities
  - Traffic regulation
  - Working with Police Commissioner's Office
  - Working with Corporation of Chennai
  - Working with Health Department
  - Blind assistance
  - Garments collection
  - Non-formal education
  - 'Environmental Education, Awareness and Training (EEAT)'
  - Blood donation

Text Books

1. Nirmalya Kumar Sinha and Dr. Surajit Majumder , Text Book of National Service Scheme (Volume –I), Vidya Kutir Publications 2021.
2. Nirmalya Kumar Sinha and Dr. Surajit Majumder , Text Book of National Service Scheme (Volume –II), Vidya Kutir Publications 2021.

References

1. Gurmeet Hans ,Case material as Training Aid for field workers.
2. Kapil K.Krishan, Social service opportunities in Hospitals.
3. Ram Ahuja, Social Problems in India,..
4. Government of India, National Service Scheme Manual.
5. TISS Training Programme on National Programme scheme,.
6. TISS, Orientation Courses for N.S.S. Programme officers,.

Evaluation Scheme

1. Participation in Regular Activities 40 Marks out of 50.

$$\frac{\text{Number of Activites Attended x Total Attendance Points}}{\text{Total number of Activities}} = \text{Attendance Marks}$$

$$Example: \frac{5 \text{ x } 40}{5} = 40$$

2. Participation in various Activities 10 Marks out of 50.
   - Participation in RD, SRD, NIC or any National Level Camp -10 Marks out of 10.
   - Participation in State Level Camp (Avhan, Utkartsh, Prearana Etc.) 08 marks out of 10.
   - Participation in Regional, University, district Level Camp/ Workshop 07 Marks out of 10.
   - Participation in Annual Special camp 06 Marks out of 10.

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Course code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC003	Yoga and Meditation	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC003	Yoga and Meditation	50	40%	-	-	50

Course Description

This course provides a form of exercise that uses specific body postures to achieve physical and mental health benefits, while meditation is a practice that can be done with or without movement in order to focus and calm the mind

Pre-requisites:

Course Objectives

- Stilling the mind and gaining insight, resting in detached awareness, and liberation (Moksha) from saṃsāra and duḥkha
- Sense of calm, peace and balance

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:** **Demonstrate**[2] basic skills associated with yoga activities including strength and flexibility, balance and coordination.
- **CO2:** **Demonstrate**[2] the ability to perform yoga movements in various combination and forms.
- **CO3:** **Identify**[1] a new perspective on stressful situations NSS regular activities

List of Activities

- Suryanamaskar
- Standing Asanas
  - Tadasana
  - Trikonasan
  - Padhamasan
  - Ardhachakrasan
  - Vrukashsan
- Sitting Asanas
  - Bhadrasan
  - Vajrasan
  - Utanmandukasan
  - Vakrasana
- Supine Asanas
  - Pawanmuktasan
  - Setubandhasana
  - Ardhahalasan
  - Shavasan
- Prone Asanas
  - Navakasana
  - Bhujangasan
  - Dhanurasana
  - Makrasana
  - Shalbhasana
- Pranayama
  - Bhastrika
  - Kapal Bharti
  - Ujjai
  - Anulom-Vilom
  - Sheetali
  - Bhramari
- Meditation

Text Books

1. Iyengar,B.K.(2008).Light on Yoga.Orient Long man Pvt.Ltd.Mumbai.
2. Iyengar,B.K.(2008).Light on Pranayama. Orient Long man Pvt. Ltd. Mumbai.
3. Iyengar,B.K.(2008).Light on Astanga Yoga.Alchemy Publishers. NewDelhi.

References

1. Iyengar, B.K.(2008).Yoga the Path to Holistic Health. Dorling Kinders ley.London.
2. Gharote, M. L. (2013). Guidelines for Yogic Practices. The Lonavla Yoga Institute. India.

Evaluation Scheme

1. The 50 marks would be evaluate based on the scheme:

Sr. No.	Activity	Marks
1.	Practice and Performance	10
2.	Regularity	10
3.	Discipline	05
4.	Suryanamskar : **Compulsory**	05
5.	Standing & Siting asanas: **Any two**	05
6.	Supine & Prone asanas : **Any two**	05
7.	Pranayama :**Any two**	05
8.	Mediation	05
	Total	**50**

*****

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC004	Physical Fitness	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC004	Physical Fitness	50	40%	-	-	50

Course Description

This course provides a execute daily activities with optimal performance, endurance, and strength with the management of disease, fatigue, and stress and reduced sedentary behaviour.

Pre-requisites:

Course Objectives

- The main objectives of physical education are to: develop motor abilities like strength, speed, endurance, coordination, flexibility, agility and balance, as they are important aspects for good performance in different games and sports.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:** **Reduce**[1] your risk of a heart attacks.
- **CO2:** **Manage**[1] your weight better.
- **CO3:** **Manage**[1] a lower blood cholesterol level and lower the risk of type 2 diabetes and some cancers.

List of Activities

- Endurance
  - 5 Minute run
  - 12Min.RunWalk
- Speed
  - 40 Metre Sprint Test
  - Shuttle Run Test
  - Flying 30 Metre Test
  - Rope Skipping
- Agility
  - Zig-Zag Run
  - 'T' Drill Test
  - Burpee Test
- Strength
  - Sit-ups
  - Push-up
  - Standing Long
  - Jump Test
  - Bench Press Test
- Flexibility
  - Sit & rich
  - Modified Sit & Reach Test
  - Static Flexibility Test – Shoulder

Text Books

1. Kansal, D. K. Textbook of Applied Measurement Evaluation & Sports Selection, Sports and Spiritual Science Publication, NewDelhi 2008.
2. Lipman, H. A., Measurement and Evaluation in Physical Education, Friends Publication, NewDelhi 2009.
3. Miller,T. NSCA's Guide to Testand Assessment, Human Kinetics,USA 2012.

References

1. Morrow, J., Jackson, A., Disch, J., & Mood, D. Measurement and Evaluation In human Performance, Human Kinetics.USA 2005.
2. Scott, M. G. & French, E. (2009). Measurement and Evaluation in Physical Education, Sports Educational Technologies, New Delhi 2009.
3. Yobu, A., Test Measurement and Evaluation in Physical Education and Sports.Friends Publication. NewDelhi 2010.

Evaluation Scheme

1. The 50 marks would be evaluate based on the scheme:

Sr. No.	Activity	Marks
1.	Practice and Performance	10
2.	Regularity	10
3.	Discipline	05
4.	Endurance :**Any one activity**	05
5.	Speed : **Any two activity**	05
6.	Agility :**Any two activity**	05
7.	Strength :**Any two activity**	05
8.	Flexibility :**Any two activity**	05
	Total	**50**

*****

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC005	Performing Arts-Music	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC005	Performing Arts-Music	50	40%	-	-	50

Course Description

This course is designed to develop musical skills that will lead to a thorough understanding of musical Instruments. Students are prepared to take the Music Theory Final when they have completed the course.

Pre-requisites:

Course Objectives

- This is a generic course and provides an opportunity to the students of other disciplines to have an introduction to the nuances of music and its appreciation. Basic voice culture, learning simple compositions in the prescribed ragas and will understand the basics of Guitar and Keyboard.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:** **Demonstrate**[3] a grounding in musical instrument studies
- **CO2:** **Apply**[2] theoretical concepts and approaches derived from considering musical instruments from varied perspectives
- **CO3:** **Understand**[2] and learn using the Notes and Octave.
- **CO4:** **Demonstrate**[3] to perform on the notes.

List of Activities

- Understanding of Music – Guitar and Keyboard.
- Differentiating blowing, String, lite, String Instruments
- Holding Of Guitar, Care of Guitar. Holding Of Keyboard, Care of Keyboard.
- Pick and Its Holding.
- Tuning of 6 strings of guitar.
- Playing on all notes on Keyboard.
- Playing of odd notes on Keyboard.
- Playing of even notes on Keyboard.
- Up down strokes of Guitar.
- Spiral up down strokes on guitar on 12 frets.
- C scale form 5th string. (Ascending, Descending)
- Playing of L no. 1 (Birthday Song)
- Playing of L no. 2(Jana Gana Mana)

Text Books

1. Kansal, D. K. Textbook of Applied Measurement Evaluation & Sports Selection, Sports and Spiritual Science Publication, NewDelhi 2008.
2. Lipman, H. A., Measurement and Evaluation in Physical Education, Friends Publication, NewDelhi 2009.
3. Miller,T. NSCA's Guide to Testand Assessment, Human Kinetics,USA 2012.

References

1. Morrow, J., Jackson, A., Disch, J., & Mood, D. Measurement and Evaluation In human Performance, Human Kinetics.USA 2005.
2. Scott, M. G. & French, E. (2009). Measurement and Evaluation in Physical Education, Sports Educational Technologies, New Delhi 2009.
3. Yobu, A., Test Measurement and Evaluation in Physical Education and Sports.Friends Publication. NewDelhi 2010.

Evaluation Scheme

1. The 50 marks would be evaluate based on the scheme:

Sr. No.	Activity	Marks
1.	Practice and Performance	10
2.	Regularity	10
3.	Discipline	10
4.	Playing on all notes on Keyboard.	10
5.	Playing on all notes on Guitar.	10
	Total	**50**

*****

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC006	Fine Arts	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC006	Fine Arts	50	40%	-	-	50

Course Description

This course aims at providing students with basic understanding of fine arts skills and knowledge. The main purpose of the subject is to help the students in understanding the basic concept of Art, origin, history, drawing & painting, etc. and how creativity if fostered professionally can result in beautiful designs for today's scenario.

Pre-requisites: Basic Drawing & Coloring

Course Objectives

- The knowledge gained with this course will help students to foster creativity and self-expression (basic understanding of color concept and application in relation to different use cases)
- Techniques studied from Visual arts should be used by the students in their respective field to make a more impactful presentation overall. Students will learn to appreciate art in a more critically artistic way.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1: Appreciate**[1] Traditional Indian Art
- **CO2: Understand**[1]fundamentals of Visual Arts.
- **CO3: Implement**[2]creative skills in Drawing & Painting
- **CO4: Create**[3] Various day to day articles in a creative format.

List of Activities

- Performing Secondary Research on Indian Art forms
- Performing Secondary Research on Traditional Painting Techniques of India
- Assignment on Elements of Design
- Assignment on Principles of Design
- Assignment on Basics of Drawing
- Assignment on Basics of Painting
- Prepare Commercial Art article

Text Books

1. Ncert ,An Introduction To Indian Fine Arts Part 1 ,National Council of Education Research and Training,2019.
2. Ncert ,An Introduction To Indian Fine Arts Part 2 ,National Council of Education Research and Training,2021.

References

1. Dasgupta, S.N.: Fundamentals of Indian Art
2. Dr. Kurt Herbert ,Artists Technique,

Evaluation Scheme

1. The 50 marks would be evaluate based on the scheme:

Sr.No	Developing Skills at Grade Level	Excellent	Very Good	Good	Satisfactory	Developing
1.	Understanding of Art	10	8	6	4	2
2.	Creativity	10	8	6	4	2
3.	Understanding of Elements	10	8	6	4	2
4.	Understanding of Principles	10	8	6	4	2
5.	The Hand	10	8	6	4	2

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U03VE001	Constitution of India	02	-		02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U03VE001	Constitution of India	-	10	5	15	40%	35	40%	50

Course Description

The objective of this course is to highlight key features of Indian Constitution, like directive principles of state policy, fundamental rights and duties, and the various organs of constitution.

Pre-requisites: -

Course Objectives

- To make students aware of the significance and basic concepts of constitution of India
- To acquaint them with the importance of fundamental rights and fundamental duties.
- To familiarize them with functioning of Union, State and Local Governments in Indian federal system.
- To make them aware of procedure and effects of emergency, composition and activities of election commission and amendment procedure.

Course Outcomes: After the successful completion of this course students will able to:

- **CO1** **Realise**[2] the significance of constitution of India in their everyday life.
- **CO2** **Identify**[2] the importance of fundamental rights as well as fundamental duties
- **CO3** **Describe**[1] the roles of Union and State Executives
- **CO4** **Explain**[2] procedure and effects of emergency, composition and activities of election commission and amendment procedure

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction to Indian Constitution**	**6**
1	1.1	Meaning and importance of the Constitution, salient features of Indian Constitution. Preamble of the Constitution.	
	1.2	Fundamental rights- meaning and limitations. Directive principles of state policy and Fundamental duties -their enforcement and their relevance.	
2.0		**Union Executive and Union Legislature**	**6**
2	2.1	Union Executive- President, Vice-president, Prime Minister, Council of Ministers.	
	2.2	Union Legislature- Parliament and Parliamentary proceedings. Union Judiciary-Supreme Court of India – composition and powers and functions.	
3.0		**State Executive and State Legislature**	**6**
3	3.1	State Executive- Governor, Chief Minister, Council of Ministers..	
	3.2	State Legislature-State Legislative Assembly and State Legislative Council	
	3.3	State Judiciary-High court.	
4.0		**Local Government**	**6**
4	4.1	Local Government-Panchayat raj system with special reference to 73rd Amendment	
	4.2	Urban Local Self Govt. with special reference to 74th Amendment	
5.0		**Election Commission and Human Rights**	**6**
5	5.1	Election Commission of India-composition, powers and functions and electoral process.	
	5.2	Human Rights –Meaning and Definitions, Working of National Human Rights Commission in India	

Text Books

1 Dr. Br Ambedkar, The Constitution of India.

2. Durga Das Basu, Introduction to the Constitution on India, (Students Edn.) Prentice –Hall EEE, 19th / 20th Edn., 2002

3 M.V.Pylee, An Introduction to Constitution of India, Vikas Publishing,2002.

4. Brij Kishore Sharma,Introduction to the Constitution of India, PHI Learning Pvt. Ltd., New Delhi,2011

References

1. D D Basu, Introduction to the Constitution of India.

2. Subhash Kashyap, Concise Encylcopedia of Indian Constitution.

3. Pradeep Sharma and Jayal, Local Governance in India: Decentralization and Beyond.

Internal Assessment (T1, T2 and FET)

1. T2 should be based on first to fourth modules for 10 marks.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprised of 5 questions, each carrying 7 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U03VE002	Universal Human Values-I	-	-		Audit Course	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U03VE002	Universal Human Values-I	-	-	-	-	-	-	-	-

Course Description

This course provides self verification, on the basis of one's own Natural Acceptance, leading to self-confidence and self- evolution.

Pre-requisites: -

Course Objectives

- To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding to the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
- To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Explore**[2] themselves: get comfortable with each other and with the teacher; they start appreciating the need and relevance for the course.
- **CO2** **Describe**[2] that the natural acceptance (intention) is always for living in harmony, only competence is lacking!
- **CO3** **Differentiate**[3] between the characteristics and activities of different orders and study the mutual fulfilment among them.
- **CO4** **Present**[1] sustainable solutions to the problems in society and nature

Course Contents

Module	Unit	Description	Hours
1.0		**Introduction to Value Education**	**6**
1	1.1	Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education)	
	1.2	Understanding Value Education	
	1.3	Self-exploration as the Process for Value Education	
	1.4	Continuous Happiness and Prosperity – the Basic Human Aspirations	
	1.5	Happiness and Prosperity – Current Scenario	
	1.6	Method to Fulfil the Basic Human Aspirations	
2.0		**Union Executive and Union Legislature**	**6**
2	2.1	Understanding Human being as the Co-existence of the Self and the Body	
	2.2	Distinguishing between the Needs of the Self and the Body	
	2.3	The Body as an Instrument of the Self	
	2.4	Understanding Harmony in the Self	
	2.5	Harmony of the Self with the Body	
	2.6	Programme to ensure self-regulation and Health	
3.0		**Harmony in the Family and Society**	**6**
3	3.1	Harmony in the Family – the Basic Unit of Human Interaction	
	3.2	Trust' – the Foundational Value in Relationship	
	3.3	'Respect' – as the Right Evaluation	
	3.4	Other Feelings, Justice in Human-to-Human Relationship	
	3.5	Understanding Harmony in the Society	
	3.6	Vision for the Universal Human Order	

4.0		**Harmony in the Nature/Existence**	**6**
4	4.1	Understanding Harmony in the Nature	
	4.2	Interconnectedness, self-regulation and Mutual Fulfillment among the Four Orders of Nature	
	4.3	Realizing Existence as Co-existence at All Levels	
	4.4	The Holistic Perception of Harmony in Existence	
5.0		**Implications of the Holistic Understanding – a Look at Professional Ethics**	**6**
5	5.1	Natural Acceptance of Human Values	
	5.2	Definitiveness of (Ethical) Human Conduct	
	5.3	A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order	
	5.4	Competence in Professional Ethics	
	5.5	Holistic Technologies, Production Systems and Management Models-Typical Case Studies	
	5.6	Strategies for Transition towards Value-based Life and Profession	

Text Books

1. R R Gaur, R Asthana, G P Bagaria ,A Foundation Course in Human Values and Professional Ethics, , 2nd Revised Edition, Excel Books, New Delhi, 2019.
2. R R Gaur, R Asthana, G P Bagaria , Manual for A Foundation Course in Human Values and Professional Ethics, 2nd Revised Edition, Excel Books, New Delhi, 2019.

References

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. Mohandas Karamchand Gandhi, The Story of My Experiments with Truth.
4. E. F Schumacher, Small is Beautiful.
5. Cecile Andrews, Slow is Beautiful.
6. Pandit Sunderlal, Bharat Mein Angreji Raj.
7. Mohandas K. Gandhi , Hind Swaraj or Indian Home Rule.
8. Maulana Abdul Kalam Azad , India Wins Freedom.
9. Vivekananda, Romain Rolland (English).

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Programme Structure for B Tech.: First Year Computer Science and Engineering
Semester II: Teaching Scheme

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Th	Pr	Tu	Th	Pr	Tu	Total Credits
U01BS201	Applied Mathematics II	3	-	-	3	-	-	3
U01BS001 U01BS002	Applied Chemistry OR Applied Physics	3	-	-	3	-	-	3
U01ES001 U01ES002	Engineering Mechanics OR Engineering Graphics	2	-	-	2	-	-	2
U01ES003 U01ES004	Basic Civil and Mechanical Engineering OR Basic Electrical and Electronics Engineering	3	-	-	3	-	-	3
U01BS003 U01BS004	Applied Chemistry Lab OR Applied Physics Lab	-	2	-	-	1	-	1
U01ES005 U01ES006	Engineering Mechanics Lab OR Engineering Graphics Lab	-	4	-	-	2	-	2
U01ES007 U01ES008	Basic Civil and Mechanical Engineering Lab OR Basic Electrical and Electronics Engineering Lab	-	2	-	-	1	-	1
U03AE001 U01IK002	Professional Communication OR Ancient Indian Logic from the view point of Computer Science and Engineering	2*	-	-	2	-	-	2
U01VS001 U01VS002	Workshop Practice-I:C Programming OR Workshop Practice-II: Basic Engineering Practices	-	4	-	-	2	-	2
U04CC0XX	Co-curricular courses II	-	4	-	-	2	-	2
	Total	**13**	**16**		**13**	**8**		**21**

- ***Out of 2 hours, 1 hour Theory shall be taught to entire class followed by 1 hrs. Practical in batches,**

Th: Theory, Pr: Practical, Tu: Tutorial

Semester II: Evaluation Scheme

Course Code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				ESE	Term work	Practical Oral/POE	
		T1	T2	FET	Total				
U01BS201	Applied Mathematics II	10	10	5	25	50	-	-	75
U01BS001 OR U01BS002	Applied Chemistry OR Applied Physics	10	10	5	25	50	-	-	75
U01ES001 OR U01ES002	Engineering Mechanics OR Engineering Graphics	-	10	5	15	35	-	-	50
U01ES003 OR U01ES004	Basic Civil and Mechanical Engineering OR Basic Electrical and Electronics Engineering	10	10	5	25	50	-	-	75
U01BS003 OR U01BS004	Applied Chemistry Lab OR Applied Physics Lab	-	-	-	-	-	25	-	25
U01ES005 OR U01ES006	Engineering Mechanics Lab OR Engineering Graphics Lab	-	-	-	-	-	50	-	50
U01ES007 OR U01ES008	Basic Civil and Mechanical Engineering Lab OR Basic Electrical and Electronics Engineering Lab	-	-	-	-	-	25	-	25
U03AE001 OR U01IK002	Professional Communication OR Ancient Indian Logic from the view point of Computer Science and Engineering	-	10	5	15	35	-	-	50
U01VS001 OR U01VS002	Workshop Practice-I:C Programming OR Workshop Practice-II: Basic Engineering Practices	-	-	-	-	-	50	-	50
U04CC0XX	Co-curricular courses II	-	-	-	-	-	50	-	50

- **Minimum passing is 40% for all courses and evaluation head mentioned above. FET – FET – Faculty evaluation for Theory, T1, T2, Continuous Assessment Test, Term Work, ESE - End Semester Examination, P/F – Pass/ Fail Course, AU – Audit Course**

Exit Option:

- Students will have the flexibility to enter a programme in odd semesters and exit a programme after the successful completion of even semesters as per their future career needs.
- Students exiting the First-Year program after securing minimum 40 credits will be awarded UG Certificate in the relevant Discipline /Subject provided they secure 8 credits in work-based vocational courses or internship / Apprenticeship offered during summer vacation in addition to 4 credits from skill-based courses earned during the first and second semester.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS201	Applied Mathematics II	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01BS201	Applied Mathematics II	10	10	5	25	40%	50	40%	75

Course Description

This course is at even semester of first year Technology. It is a foundation course in Mathematics and may be prerequisites for other courses. It covers Complex numbers, hyperbolic functions, Differential equations, Special functions, multiple integrations and its applications.

Pre-requisites: Applied Mathematics I

Course Objectives

- To know and discuss the need and use of complex variables to find roots, to separate complex quantities and to establish relation between circular and hyperbolic functions.
- To understand and solve first order and first-degree differential equations.
- To understand and evaluate improper integrals.
- To evaluate double integral.

Course Outcomes: After the end of this course students will be able to

- **CO1** **Find**[3] roots of complex number.
- **CO2** **Find**[3] relation between circular and hyperbolic functions.
- **CO3** **Solve**[3] differential equation of first order and first degree.
- **CO4** **Evaluate**[4] improper integral by Gamma and Beta function.

Course Contents

Module	Unit	Description	Hours
1.0		**Complex Number**	**9**
1	1.1	Introduction, modules and arguments, types of complex number, DeMoiver's theorem (without proof), roots of complex number	
	1.2	Expansion of sin(nθ), cos (nθ) in powers of sinθ and/or cosθ , expansion of $\sin^n\theta$and $\cos^n\theta$in terms of sines and cosines of multiple of θ.	
2.0		**Hyperbolic function**	**9**
2	2.1	Hyperbolic functions, relation between circular and hyperbolic functions, formulae of hyperbolic functions (without proof).	
	2.2	Inverse hyperbolic function.	
	2.3	Separation of real and imaginary parts of complex number, logarithmic function of a complex variable.	
3.0		**Differential equation of first order and first degree**	**9**
3	3.1	Definition, order and degree of differential equation	
	3.2	Solution of differential equation of first order and first degree by linear equations, equation reducible to linear, exact differential equations, equation reducible to exact.	
4.0		**Special Function**	**9**
4	4.1	Gamma function, properties of gamma function, beta function, properties of beta function	
	4.2	Relation between beta and gamma function.	
5.0		**Double Integral and Area**	**9**
5	5.1	Double integral, Evaluation of double integration in Cartesian and polar form	
	5.2	Change of order of integration, change to polar, Double integration over the region.	
	5.3	Area enclosed by plane curves by double integral	

Text Books

1. Grewal. B. S "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi, (2011).
2. Bali N. P and Manish Goyal, A Textbook of Engineering Mathematics, Eighth Edition, Laxmi Publications Pvt Ltd., (2011)
3. Dass, H.K., and Er. RajnishVerma, Higher Engineering Mathematics, S. Chand Private Ltd., (2011).

References

1. Glyn James, Advanced Modern Engineering Mathematics, 3rd Edition, Pearson Education, (2012).
2. Peter V and O'Neil, Advanced Engineering Mathematics, 7th Edition, Cengage learning, (2012).

Internal Assessment (T1, T2 and FET)

3. T1 (Test 1) should be based on first two modules and T2 (Test 2) should be based on next two modules, for 10 marks each.
4. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS001	Applied Chemistry	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01BS001	Applied Chemistry	10	10	5	25	40%	50	40%	75

Course Description

This is foundation course in science and may be prerequisite course of other engineering courses. It covers quality parameters of water, corrosion of engineering materials, metallurgy, fuel, cell and green chemistry

Pre-requisites:

Course Objectives

- To understand the basic principles of chemistry.
- To study the applications of chemistry in various engineering disciplines
- To create an awareness of the environmental impact of engineering activities and the role of chemistry in addressing it.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Estimate**[3] water quality parameters for applications in water purification.
- **CO2** **Examine**[3] the mechanism of corrosion to prevent corrosion.
- **CO3** **Describe**[2] the significance of advanced material, process of metallurgy and alloy
- **CO4** **Explain**[2] the concepts of Fuel, cell, batteries and Electrochemistry.

Course Contents

Module	Unit	Description	Hours
1.0		**Water**	**9**
1	1.1	Introduction, impurities in natural water, water quality parameters total solids, acidity, alkalinity, chlorides, and dissolved oxygen (definition, causes, significance), hardness of water (Causes, types, units of hardness),	
	1.2	Ill effects of hard water in steam generation in boilers (Scale, Sludge & caustic embrittlement), numerical on hardness, treatment of hard water (ion exchange and reverse osmosis).	
2.0		**Corrosion and its Prevention**	**9**
2	2.1	Introduction, basic concepts(electrochemistry), causes, classification, atmospheric corrosion (oxidation corrosion), Electrochemical corrosion (hydrogen evolution and oxygen absorption mechanism), factors affecting rate of corrosion. Prevention of corrosion by proper design and material selection, hot dipping (galvanizing and tinning), Cathodic protection, metal spraying and electroplating.	
	2.2	Green Chemistry: Introduction, Need and Historical Background of Green Chemistry, Concept of Systems Thinking, Circular economy and Sustainability, Twelve principles of Green Chemistry.	
3.0		**Engineering Materials**	**9**
3	3.1	Polymers: Introduction, thermo softening and thermosetting plastics, industrially Important plastics like phenol formaldehyde, urea formaldehyde and epoxy resins, conducting Polymers (doping, conjugation, conductivity), examples and applications, biodegradable plastics.	
	3.2	Cement: Classification, Composition and manufacturing of Portland cement. Refractories: Classification and properties.	

4.0		**Metallurgy and Alloys**	**9**
4	4.1	Introduction, concepts of metals and nonmetals in periodic table, basic terms in metallurgy (mineral, ore, metallurgy). Process of extraction of metal: Concentration of ore, Ore to metaloxide, Metaloxide to metal, purification of metal.	
	4.2	Alloys: Definition, purposes of making alloys with examples. Classification of Alloys- Ferrous and nonferrous alloys	
5.0		**Fuels and Energy Source**	**9**
5	5.1	**Fuels:** Introduction, classification, calorific value, definition, units (calorie, kcal, joules, kilojoules), characteristics of good fuels, comparison between solid, liquid and gaseous fuels, types of calorific Value (higher and lower), Bomb calorimeter and Boy's calorimeter. Numerical on Bomb and Boy's calorimeter. Renewable and non-renewable sources.	
	5.2	**Energy Source:** Basic terms and types of batteries (a) Primary batteries – Lechalanche cell (dry cell) (b) Secondary batteries(Accumulators) Lead acid battery (c) Fuel cells- $H_2 – O_2$ fuel cell	

Text Books

1. S. S. Dara and S. S. Umare , A Textbook of Engineering Chemistry, S. Chand & CompanyLtd., New Delhi.
2. C. P. Murthy, C. V. Agarwal and A. Naidu, A Textbook of Engineering Chemistry, BS Publications, Hyderabad.

References

1. Jain and Jain, Engineering Chemistry, Dhanpat Rai Publishing Company Ltd., New Delhi.
2. Pendse M H, Joshi S S, Bhavsar C M, Kulkarni S D, Nirali Prakashan, Engineering Chemistry.
3. V. K. Ahluwalia, Green Chemistry, Environmentally benign Reaction ,Ane Books Pvt Ltd
4. Dr. A. K. Pahari and Dr. B. S. Chauhan, Engineering Chemistry, Laxmi Publications (P) Ltd, New Delhi.
5. B. K. Sharma, Industrial Chemistry (Including Chemical Engineering), GOEL Publishing House.

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately..

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS002	Applied Physics	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01BS002	Applied Physics	10	10	5	25	40%	50	40%	75

Course Description

This course is designed in such a way that it bridges the sciences and engineering, technology. The syllabus effectively focuses on the concepts needed for first year technology students for their further technological studies.

Pre-requisites

- Basic knowledge about Sound, Ultrasonic sound and their properties.
- Knowledge Electromagnetic spectrum
- Idea about interference, diffraction and polarisation etc.
- Basic of magnetism and different phases of matter.

Course Objectives:

- To introduce students to the basic principles of Ultrasonic's and acoustics and its application.
- To study in details the concepts of interference, diffraction and polarisation and to study their applications.
- To provide students with the basic knowledge of quantum physics .
- To prepare students for further studies in related fields.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Discuss**[2]The basic theory and principles of production of ultrasonic sound and acoustics.
- **CO2** **Explain**[3] Properties and applications of electromagnetic waves in engineering, LASER technology and fiber optics and their applications.
- **CO3** **Understand**[2] and **Explain**[3]Particle nature of light and basic of quantum mechanics.
- **CO4** **Apply**[4]Knowledge of magnetism and crystallography in Engineering field.

Course Contents

Module	Unit	Description	Hours
1.0		**Ultrasonic and Acoustics**	**9**
1	1.1	Introduction, production of ultrasonic waves by Piezoelectric and Magnetostriction method (Using transistor circuit), properties of ultrasonic waves, determination of wavelength and velocity of ultrasonic waves, application of ultrasonic waves.	
	1.2	Acoustics: Introduction, Basic requirements for acoustically good hall, reverberation, time of reverberation, Sabine's formula (No derivation), absorption coefficient, factors affecting architectural acoustics and their remedies, Numerical.	
2.0		**Properties and Applications of Electromagnetic Waves**	**9**
2	2.1	Properties of Electromagnetic Waves: Interference, diffraction, double refraction and polarization.	
	2.2	Applications of Electromagnetic Waves: Applications of microwave and radio waves, Infrared rays, Ultraviolet rays, X-rays and gamma rays.	
3.0		**Laser and Fibre Optics:**	**9**
3	3.1	Laser Basic process and Lasing action (metastable state, population inversion), Applications communication in space, medical and industry.	
	3.2	Fiber optics: Structure and principle, types of optical fibers, Applications-medical applications / communication.	
4.0		**Quantum Mechanics**	**9**
4	4.1	Development of Quantum theory, wave-particle duality, de-Broglie hypothesis, matter waves, different forms of matter wave.	
	4.2	Heisenberg's Uncertainty principle, Photoelectric and Compton effect, Numerical.	

5.0		**Magnetic Materials and Crystal Physics**	**9**
5	5.1	Origin of magnetic moment, magnetic properties of materials, Magnetic susceptibility, Classification of diamagnetic, paramagnetic and ferromagnetic materials, Ferromagnetic domains, Hysteresis in ferromagnetic materials, Soft and Hard magnetic materials, applications of magnetic materials	
	5.2	**Crystal Physics:** Introduction to basic concepts, Bravais Lattices, Properties of Crystal symmetry elements of a cubic crystal, Miller Indices.	
	5.3	X-ray diffraction: Bragg's law and powder method.	

Text Books

1. A. K. Jha, A Textbook of Applied Physics, Volume 1, I. K. International Pvt Ltd,2009.
2. R.Balasubramaniam, Callister's Materials Science and Engineering, Wiley (Indian Edition),2014.
3. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw Hill Education (Indian Edition), 2020.
4. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019.

References

1. Mehta Neeraj, Applied Physics for Engineers, PHI Learning Pvt. Ltd.,2011.
2. Paul E. Tippens, Applied Physics, Gregg Division McGraw-Hill Book Co.,1985.

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES001	Engineering Mechanics	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01ES001	Engineering Mechanics	-	10	5	15	40%	35	40%	50

Course Description

Engineering Mechanics is a subject that deals with the principles, calculations, and laws of Forces; along with their applications to Mechanical Engineering problems. Engineering Mechanics is used to solving real-life designing, analyzing, and constructing things.

Pre-requisites: -

Course Objectives

- Understand the force systems and draw free body diagram to analyze rigid body equilibrium
- Compute the centroid, first moment and second moment of an area
- Understand the concept of motion of particles and rigid bodies.
- Explain different energy principles of mechanics

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Determine**[1] the Resultant of Concurrent and Non-Concurrent Force System
- **CO2** **Analysis**[3] of Structures for a given force system to determine Moment of Inertia
- **CO3** **Demonstrate**[3] the concept of Kinetics and Kinematics of a particle
- **CO4** **Illustrate**[3] Principles of Work and Energy and Principle of Impulse and Momentum

Course Contents

Module	Unit	Description	Hours
1.0		**Fundamental Concepts and Principles of Mechanics**	**6**
1	1.1	Newton's Laws of Motion, Forces on Particle, Systems of 2D forces**,** Resolution, Composition and Resultant of Concurrent Forces	
	1.2	Law of Parallelogram of Forces, Equilibrium of a Particle, Lami's Theorem, Free-Body Diagrams	
2.0		**Moment of a Force**	**6**
2	2.1	Moment, Couple, Equilibrium of 2D Rigid Bodies, Resultant of Non-Concurrent Force System	
	2.2	Moment, Couple, Equilibrium of 2D Rigid Bodies, Resultant of Non-Concurrent Force System	
3.0		**Centroids and Moment of Inertia and Non-liner motion**	**6**
3	3.1	Centre of Gravity of a 2D Body, 2.Centroids of Areas and Lines, Composite Plates	
	3.2	Moment of Inertia, of an Areas, Polar Moment of Inertia, Radius of Gyration of an AreaParallel-Axis Theorem, Perpendicular Axis Theorem, Moments of Inertia of Composite Areas	
4.0		**Kinematics and Dynamics of Motion**	**6**
4	4.1	Introduction to Kinematics of Linear motion (no numerical on kinematics), Kinetics of linear motion, Newton's Laws, D'Alembert's Principle, Work- Energy Principle, Impulse Momentum Principle.	
	4.2	Rectilinear Motion of Particles, Dependent Motion of Particles, Curvilinear Motion of ParticlesRelative Motion, Projectile Motion, Linear Momentum of a Particle, Dynamic Equilibrium,Equations of Motion in Terms of Radial and Transverse Components, Kepler's Laws of Planetary Motion. Work of a Force, Kinetic Energy of a Particle.	

5.0		**Principle of Work and Energy**	**6**
5	5.1	Applications of the Principle of Work and Energy, Power and Efficiency, Potential Energy Conservative Forces, Conservation of Energy Motion under a Conservative Central Force.	
	5.2	Principle of Impulse and Momentum, Impulsive Motion, Impact, Direct Central Impact, Oblique Central Impact.	

Text Books

1. Beer &Johnston, Engineering Mechanics, Tata McGraw Hill.

References

1. Timoshenko and Young, Engineering Mechanics, Third Edition, McGraw Hill Publishers,2006.
2. J.L.Meriam and L.G. Kraige, Engineering Mechanics, Seventh Edition, John Wiley & Sons, 2012.
3. Gere and Timoshenko, Mechanics of Materials, Second Edition, CBS Publishers, 2011.

Internal Assessment (T1, T2 and FET)

1. T2 should be based on First to Fourth modules, for 10 marks.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES002	Engineering Graphics	02	--	-	02	--	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01ES002	Engineering Graphics	-	10	5	15	40%	35	40%	50

Course Description

This course aims to make students conversant with methods of engineering drawing and to learn CAD software so that they could draw and make best use of it in drawing of engineering graphics.

Pre-requisites: Knowledge of Steel Rule, Set-squares & Protractor.

Course Objectives

- To improve imagination skills.
- Increase ability to communicate with people through drawings.
- Train to interpret data and transform into graphical representation.
- Prepare the student for future Engineering positions.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Draw**[2] the technical drawing following all BIS conventions
- **CO2** **Apply**[3] orthographic projection method to obtain multiview, auxiliary view and sectional views
- **CO3** **Draw**[2] Isometric view from the front views, top views and/or side views.
- **CO4** **Represent & Demonstrate**[1] technical drawings

Course Contents

Module	Unit	Description	Hours
1.0		**Fundamentals of Engineering Graphics**	**6**
1	1.1	Different types of lines and material conventions used in drawing practice.	
	1.2	Dimensioning system as per BIS (Theoretical treatment only)	
2.0		**Projections of Lines & Planes**	**6**
2	2.1	Introduction to First angle and third angle methods of projection.	
	2.2	Projection of points, Projections of lines on regular, horizontal and frontal planes.	
3.0		**Orthographic Projections**	**6**
3	3.1	Lines used, Selection of views, spacing of views, dimensioning.	
	3.2	Drawing required views from given pictorial views (Conversion of pictorial view into orthographic view)	
4.0		**Orthographic Sectional Views**	**6**
4	4.1	Drawing required views from given pictorial views including sectional orthographic view	
	4.2	Drawing required views from given pictorial views including sectional orthographic view	
5.0		**Isometric projections**	**6**
5	5.1	Introduction to isometric, Isometric scale.	
	5.2	Isometric projections and Isometric views / drawings.	
	5.3	Circles in isometric view. Isometric views of simple solids and objects	

Text Books

1. N. D. Bhatt, Engineering Drawing, Charotor Publication House, Bombay
2. W. J. Luzadder, Fundamentals of Engineering Drawing, Prentice Hall of India.

References

1. Jon M.Duff, William A. Ross, Engineering Design and Visualization, CENGAGE Learning.
2. N. D. Bhatt, Machine Drawing, Charotor Publication House, Bombay.
3. French and Vierck, Graphic Science, Mc-Graw Hill International.
4. K. Venugopal, Engineering Drawing and Graphics, New Age Publication.

Internal Assessment (T1, T2 and FET)

1. T2 should be based on First to Fourth modules, for 10 marks.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES003	Basic Civil and Mechanical Engineering	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01ES003	Basic Civil and Mechanical Engineering	10	10	5	25	40%	50	40%	75

Course Description

This course deals about basic Civil Engineering and Mechanical Engineering**.** The course helps students identify the fundamentals of Civil Engineering and mechanical Engineering related to building planning, bye plans, manufacturing process.

Pre-requisites: -

Course Objectives

- Understand concept of planning and bye laws
- Compute various levels of surveying by different methods of leveling
- Explain the energy transformation processes and power plants
- Understand classification of manufacturing processes

Course Outcomes: After the successful completion of the course students will able to:

- CO1: **Ápply**[3] Principals of Planning and Bye Laws practically
- CO2: **Evaluate**[2] various levels of surveying by different methods of levelling
- CO3: **Classify**[2] Energy Sources and Mechanical Power Transmission devices.
- CO4: **Suggest**[2] suitable manufacturing processes for different applications.

Course Contents

Module	Unit	Description	Hours
1.0		**Relevance of Civil Engineering and Building Planning**	**9**
1	1.1	Introduction, branches of civil engineering, application of civil engineering in other allied fields.	
	1.2	Introduction to types of loads, load bearing and framed structures.	
2.0		**Components of Building**	**9**
2	2.1	Elements of sub-structures and their functions, types of foundations and their suitability	
	2.2	Elements of super-structures and their functions	
3.0		**Principles of planning & Bye-Laws and Surveying**	**9**
3	3.1	Principles of planning, introduction to Bye-Laws related to BUA, FSI etc. Principles of surveying, bearing and its types, system of bearing, Levelling,	
	3.2	Terms used in levelling, types of levelling	
4.0		**Introduction to Energy Sources and its conversion**	**9**
4	4.1	Energy sources: Renewable and Non-renewable Energy Sources, Hydropower energy, nuclear energy, Steam Power Plant, Solar energy, Geothermal energy, Wind energy, Tidal energy,	
	4.2	Introduction of pump, compressor, turbines. Power Transmission Devices: Gears, Belt-Pulley, Rope Drives, Chain-Sprocket	
5.0		**Introduction to Manufacturing Processes**	**9**
5	5.1	Types of manufacturing Processes, Casting, Material Removal Processes Metal forming: Rolling, Drawing, Extrusion, Forging, Sheet metal working Introduction to Welding	
	5.2	Introduction to Automation and Robotics in industry	

Text Books

1. Arora S.P. and Bindra S.P., Basic Civil and Mechanical Engineering, Dhanpat Rai and Sons, New Delhi 1997.
2. G.D. Rai, Non-Conventional Sources of Energy, Khanna Publication

References

1. Shanmugam, G, and Palanichamy, Building Construction, Planning Techniques and Method of Construction, Tata McGraw Hill Publishing Co., New Delhi, 1996
2. P. N. Rao, Manufacturing Technology -Volume I and II, Tata Mc-Graw Hill

Internal Assessment (T1, T2 and FET)

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES004	Basic Electrical and Electronics Engineering	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01ES004	Basic Electrical and Electronics Engineering	10	10	5	25	40%	50	40%	75

Course Description

This course provides an introduction towards the fundamental principles and concepts of Electrical and Electronics engineering. It is designed to provide a solid foundation to the students who are pursuing Engineering degree in various disciplines as a beginner.

Pre-requisites: Knowledge of Physics and Mathematics in Secondary Education

Course Objectives:

- To impart the basic terminology and definitions of Electrical and Electronics engineering
- To study various laws to evaluate the performance of components in the circuits
- To acquire the basic knowledge of analog and digital devices and its functioning
- To study different number system conversions and logic gates
- To acquire the basic knowledge and operations of measuring instruments

Course Outcomes: After the Successful completion of the course students will able to:

- **CO1: Explain**[2] basic components in Electric and Magnetic Circuits.
- **CO2: Describe**[2] basic laws suitable for Electrical applications.
- **CO3: Analyse**[2] basic switches and their characteristics.
- **CO4: Interpret**[2] number systems and logical operation for Electronics circuits.
- **CO5:Explain**[2] the operation of measuring instruments and applications.

Course Contents

Module	Unit	Description	Hours
1.0		**Fundamentals and Magnetic Circuits**	**9**
1	1.1	Concept of E.M.F, Potential Difference, Current, Resistance, Resistivity and Conductivity Types of Elements: Resistance, Inductance and Capacitance. Voltage, current and power of each element, Independent and Dependent current and voltage sources, Source transformation	
	1.2	Magnetic Circuits: Concept of mmf, reluctance, magnetic flux, Magnetic Flux density, Magnetic field strength, BH curve, magnetic leakage, fringing, Comparison of Electric and Magnetic circuit and types of magnetic circuits	
2.0		**DC & AC Circuit**	**9**
2	2.1	Ohms Law, Applications of Kirchhoff's laws: KVL & KCL. Series & Parallel connection and reduction.	
	2.2	Fundamentals of Alternating quantities, Faraday's Law, Types of Induced E.M.F, Generation of sinusoidal voltage, concept of R.M.S. & Average value, form factor, Peak Factor, Pure Resistive, Inductive, Capacitive, R-L, R-C, R-L-C series circuits, powers, Significance of power factor. Laws of electromagnetic induction, Concept of self and mutual induction, Generation of single-phase and three phase sinusoidal voltage.	
3.0		**Semiconductor Devices**	**9**
3	3.1	Conductors, Insulators & Semiconductors, PN-Junction diode-Operation and Characteristics, Zener Diodes-Operation and Characteristics	
	3.2	Bipolar Junction Transistor: Construction, operation and characteristics of NPN and PNP Transistors, Input and Output characteristics of CB and CE Configuration. Relation between α , β and γ	
4.0		**Number Systems and Logic Gates**	**9**
4	4.1	Introduction to number system: binary, octal, decimal, hexadecimal. Inter conversion between number systems, Binary coded decimal (BCD) number.	
	4.2	Basic gates-AND, OR, NOT, X-OR, X-NOR with truth table, Universal gates: NAND & NOR with truth table, Design of basic logic gates by using universal gates.	

5.0		Measuring Instruments	9
5	5.1	Introduction to Voltmeter, Power meter, Ammeter, Ohm-meter, Digital Multimeter	
	5.2	Cathode Ray Oscilloscope- Block diagram, Measurement of voltage and frequency, Signal Generator, Digital Multimeter-Block diagram and its operation.	

Text Books

1. Nagrath I.J. and D. P. Kothari, "Basic Electrical Engineering", TMH Publication, 3rdEdition, 2010.
2. Ashfaq Husain, "Fundamentals of Electrical Engineering" Dhanpat Rai & Company, 4thEdition, 2011.
3. Anand Kumar, "Fundamentals of Digital Circuits" PHI Publication, 4th edition, 2017.
4. R. P. Jain, "Modern Digital Electronics", TMH Publication, 4th edition, 2010

References

1. B.L & A.K. Theraja, "Electrical Technology", Vol-II, S. Chand McGraw Hill Publication, 4thEdition, 2011.
2. N Salivanan & Sureshkumar, Electronic Devices & Circuits, Tata Mc-GrawHill.
3. Anil K. Maini, "Digital Electronics Principles and Integrated Circuits" Wiley Publications, 2007.

Internal Assessment (T1, T2 and FET):

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each. T1 and T2 can be Test/ Presentation/Any other formative assessment .
2. FET shall be assessed for 5 marks separately.

End Semester Examination:

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS003	Applied Chemistry Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term work	Min pass	Marks	Min pass	Total (Marks)
U01BS003	Applied Chemistry Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Estimate**[3] the parameters and mechanism of material used in engineering applications.
- **CO2** **Prepare**[3] the basic material used in engineering applications.

List of Experiments

All the experiments will be based on the course content of **Applied Chemistry U01BS001**

References

1. Jain and Jain, Engineering Chemistry, Dhanpat Rai Publishing Company Ltd., New Delhi.
2. Pendse M H, Joshi S S, Bhavsar C M, Kulkarni S D, Nirali Prakashan, Engineering Chemistry.
3. V. K. Ahluwalia, Green Chemistry, Environmentally benign Reaction ,Ane Books Pvt Ltd
4. Dr. A. K. Pahari and Dr. B. S. Chauhan, Engineering Chemistry, Laxmi Publications (P) Ltd, New Delhi.

Evaluation Scheme

1. TERM WORK assessment shall be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01BS004	Applied Physics Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01BS004	Applied Physics Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Develop**[2] practical skills with proper handling and selection of instruments.
- **CO2** **Understand**[1] basic theoretical concepts and properties of light and LASER.
- **CO3** **Understand**[1] hysteresis and crystal structures.

List of Experiments

All the experiments will be based on the course content of **Applied Physics – U01BS002**

References

1. Mehta Neeraj, Applied Physics for Engineers, PHI Learning Pvt. Ltd.,2011.
2. Paul E. Tippens, Applied Physics, Gregg Division McGraw-Hill Book Co.,1985.

Evaluation Scheme:

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES005	Engineering Mechanics Lab	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01ES005	Engineering Mechanics Lab	50	40%	-	-	50

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Perform**[2] experiment related to the Resultant of Concurrent and Non-Concurrent Force System
- **CO2** **Determine**[3] resultant of given force system to determine Moment of Inertia
- **CO3** **Illustrate**[3] Principles of Work and Energy and Principle of Impulse and Momentum

List of Experiments

All the experiments will be based on the course content of **Engineering Mechanics – U01ES001**

References

1. Timoshenko and Young, Engineering Mechanics, Third Edition, McGraw Hill Publishers,2006.
2. J.L.Meriam and L.G. Kraige, Engineering Mechanics, Seventh Edition, John Wiley & Sons, 2012.
3. Gere and Timoshenko, Mechanics of Materials, Second Edition, CBS Publishers, 2011.

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment done on computer graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES006	Engineering Graphics Lab	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01ES006	Engineering Graphics Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Develop** [3] isometric drawings of simple objects reading the orthographic projections of those objects.
- **CO2** **Design** [4] 3D objects with isometric principles by using computer aided sketches
- **CO3** **Produce**[2] geometric construction, dimensioning and detail drawings.

List of Experiments

All the experiments will be based on the course content of **Engineering Graphics – U01ES002**

Text Books

1. N. D. Bhatt, Engineering Drawing, Charotor Publication House,Bombay
2. W. J. Luzadder, Fundamentals of Engineering Drawing, Prentice Hall of India.

References

1. Jon M.Duff,William, A. Ross, Engineering Design and Visualization , CENGAGE Learning
2. N. D. Bhatt, Machine Drawing , Charotor Publication House, Bombay.
3. French and Vierck, Graphic Science, Mc-Graw Hill International
4. K. Venugopal, Engineering Drawing and Graphics, New Age Publication

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment done on computer graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES007	Basic Civil and Mechanical Engineering Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01ES007	Basic Civil and Mechanical Engineering Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Plot**[2] outline of the building
- **CO2** **Measurement**[1] of horizontal angle by prismatic compass
- **CO3** **Explain**[2] the principle of working of Various mechanical systems

List of Experiments

All the experiments will be based on the course content of Engineering Graphics – U01ES003

Text Books

1. Arora S.P. and Bindra S.P., Basic Civil and Mechanical Engineering, Dhanpat Rai and Sons, New Delhi 1997
2. G.D. Rai, Non-Conventional Sources of Energy, Khanna Publication

References

1. Shanmugam, G, and Palanichamy, Building Construction, Planning Techniques and Method of Construction, Tata McGraw Hill Publishing Co., New Delhi, 1996
2. P. N. Rao, Manufacturing Technology Volume I and II, Tata Mc-Graw Hill

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01ES008	Basic Electrical and Electronics Engineering Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01ES008	Basic Electrical and Electronics Engineering Lab	25	40%	-	-	25

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:Analyze[4]** the different basic laws and types of circuits
- **CO2:Deomonstrate[2]** number systems and digital logic gates.
- **CO3: Explain[2]** the operation of basic electronic switches and gates

List of Experiments

All the experiments will be based on the course content of **Basic Electrical and Electronics Engineering – U01ES004**

References

1. B.L & A.K. Theraja, "Electrical Technology", Vol-II, S. Chand McGraw Hill Publication, 4thEdition, 2011.
2. N Salivanan & Sureshkumar, Electronic Devices & Circuits, Tata Mc-GrawHill.
3. Anil K. Maini, "Digital Electronics Principles and Integrated Circuits" Wiley Publications, 2007.

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U03AE001	Professional Communication	02*	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U03AE001	Professional Communication	-	10	5	15	40%	35	40%	50

***Out of 2 hours, 1 hour theory shall be taught to entire class followed by 1 hrs, Practical in batches**

Course Description

This subject is designed to develop Communication and soft skills required in professional life. The students will learn these essential professional skills that will help them in academia and professional life.

Pre-requisites: - Basic LSRW skills acquaintance.

Course Objectives

- Understand concept of Communication skills
- Recognize the importance of LSRW skills
- Understand the importance of application of behavioral at various situations
- Identify Career Skills

Course Outcomes: After the successful completion of the course students will able to:

- **CO1: Identify** importance of communication in formal situations.
- **CO2: Apply** Language Skills (LSRW) effectively
- **CO3: Apply** Behavioural Skills in real life situations
- **CO4: Exhibit** career skills

Course Contents

Module	Unit	Description	Hours
1.0		**Communication Theory**	**6**
1	1.1	Communication: Concept and Its Meaning, Process, Types: Verbal and Non-verbal Communication, Levels and Networks of Communication: Formal and Informal, Flows of Communication, Barriers to Communication, ways to overcome different barriers, Communication in Crisis, Technology and Recent Trends in Communication.	
	1.2	Parts of speech, Vocabulary Building, Use of Body Language in Communication and Grooming,	
2.0		**Listening and Speaking Skills**	**6**
2	2.1	Importance of Listening, Listening and Hearing, Barriers to Effective Listening. Types of Listening, Techniques of Effective Listening,	
	2.2	Situational Conversations: Greetings, Introduction and Meeting People, Public Speaking and Presentation Skills	
3.0		**Reading and Writing Skills**	**6**
3	3.1	Types of Reading, Techniques for Effective Reading-SQ3R, Reading Comprehension	
	3.2	Business Correspondence: Seven C's in Business Letter, Types of Business Letters and Emails, Notices, Agenda, Minutes, Circulars, Memos and Report Writing, Employment Communication	
4.0		**Behavioural Skills**	**6**
4	4.1	Self Analysis tools and Techniques, SWOC Analysis, Attitude Building/ Developing Positive attitude	
	4.2	Problem Solving, Decision Making, Goal Setting, Time Management, Team Building, Team Work and Leadership.	
5.0		**Career Skills**	**6**
5	5.1	Applying for Job, Resume Building, Interview: Techniques & skills, Group Discussion, E-Portfolio	
	5.2	Planning and Managing Career Office Etiquettes.	

Text Books

1. Chadha, R.K., Communication Techniques and Skills, Dhanpat Rai Publications, New Delhi.
2. Raymond Murphy, Essential English Grammar: A Self-Study Reference and Practice Bookfor Elementary Students of English with Answers, Cambridge University Press
3. Green, David. Contemporary English Grammar–Structures and Composition.MacMillan India. 2014 (Print)
4. Fitikides, T. J. Common Mistakes in English. London: Orient Longman, 1984

References

1. Ashraf Rizvi, Effective Technical Communication, Tata McGraw-Hill.
2. Thomas N. Huckin& Leslie A. Olsen, Technical Writing & Professional Communication for non-native speakers of English, McGraw –Hill.
3. Nicky Stanton, Mastering Communication by, Palgrave Master Series
4. Meenakshi Raman & Sangita Sharma, Technical Communication; Principles and Practice, Oxford University Press.
5. M Ashraf Rizvi, Effective Technical Communication, Tata McGraw-Hill Education
6. Martin Hewings, Advanced Grammar in Use, Cambridge University Press, 2013

Internal Assessment (T1, T2 and FET)

1. T2 should be based on first to fourth modules for 10 marks.
2. Fifth module will be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprise of 5 questions, each carrying 7 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

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Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01IK002	Ancient Indian Logic from the view point of Computer Science and Engineering	02	-		02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		
		T1	T2	FET	Total	Min pass	Marks	Min pass	Total (Marks)
U01IK002	Ancient Indian Logic from the view point of Computer Science and Engineering	-	10	5	15	40%	35	40%	50

Course Description

This course provides an in-depth exploration of the foundational principles and systems of Ancient Indian Logic, with a focus on the Nyaya and Vaisheshika schools, as well as insights into Buddhist and Jaina perspectives. Students will delve into the rich philosophical traditions that shaped the discourse on epistemology, ontology, and logical reasoning in ancient India.

Pre-requisites: Computer Basics

Course Objectives

- Understanding Philosophical Foundations.
- Investigate key categories such as Padartha and the Nyaya theory of causation
- Introduce the unique epistemological stance of Buddhist philosophy.
- Compare Jaina logic with Nyaya, Vaisheshika, and Buddhist logical systems

Course Outcomes: After the end of this course students will be able to

- **CO1** **Identify**[1] major figures and schools associated with Ancient Indian Logic.
- **CO2** **Describe**[2] the metaphysical principles and categories of the Vaisheshika system.
- **CO3** **Apply**[3] the Nyaya syllogism in constructing logical arguments.
- **CO4** **Conduct**[4] a comparative analysis of Jaina logic with Nyaya, Vaisheshika, and Buddhist logical systems.

Course Contents

Module	Unit	Description	Hours
1.0		**Foundations of Ancient Indian Logic**	**6**
1	1.1	Overview of Ancient Indian Philosophy. Introduction to Nyaya and Vaisheshika Schools , Basic concepts in Indian Logic: Pramana, Prameya, etc.	
	1.2	Evolution of Nyaya and Vaisheshika Systems. Key Figures: Gautama, Kanada, etc. Readings: Relevant portions from Nyaya Sutras, Vaisheshika Sutras	
2.0		**Nyaya System**	**6**
2	2.1	Nyaya Epistemology and Ontology The Nyaya Syllogism (Anumana) Nyaya Categories: Padartha	
	2.2	Nyaya Theory of Causation Nyaya Logic and Language Readings: Selections from Nyaya Shastra	
3.0		**Vaisheshika System**	**6**
3	3.1	Vaisheshika Metaphysics Vaisheshika Categories: Dravya, Guna, Karma, etc. Vaisheshika Atomism	
	3.2	Vaisheshika Theory of Causation Vaisheshika and Perception Readings: Relevant portions from Vaisheshika Sutras	
4.0		**Buddhist Logic**	**6**
4	4.1	Introduction to Buddhist Philosophy Buddhist Epistemology: Pramana Abhidharma and the Analysis of Dharmas.	
	4.2	Buddhist Syllogism and Inference Comparison with Nyaya and Vaisheshika Readings: Selected texts from Abhidharma	
5.0		**Jaina Logic**	**6**
5	5.1	Overview of Jain Philosophy Jaina Theory of Reality (Syadvada) Jaina Logic and Sevenfold Predication (Saptabhanginaya).	
	5.2	Comparison with Nyaya and Buddhist Logic Readings: Relevant portions from Jain Agamas	

Text Books

1. Indian Philosophy: A Very Short Introduction" by Sue Hamilton Publisher: Oxford University Press ISBN-13: 978-0192853745
2. Classical Indian Philosophy: An Introductory Text" by J.N. Mohanty Publisher: Rowman & Littlefield ISBN-13: 978-0847689335

References

1. Indian Philosophy: An Introduction" by Roy W. Perrett. Publisher: Routledge ISBN-13: 978-0367336541
2. Indian Logic in its Sources: On Validity of Inference" by Bimal Krishna Matilal Publisher: Oxford University Press ISBN-13: 978-0198244142

Internal Assessment (T1, T2 and FET)

1. T2 should be based on first to fourth modules for 10 marks.
2. FET shall be assessed for 5 marks separately.

End Semester Examination

1. Question paper will be of 35 marks comprised of 5 questions, each carrying 7 marks.
2. The duration of end semester examination shall be Two hours.
3. The students need to solve all 5 questions.
4. Question No.1 will be compulsory and based on entire syllabus.
5. Remaining question (Q.2 to Q.5) will be selected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U01VS001	Workshop Practice-I: C Programming	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U01VS001	Workshop Practice-I: C Programming	50	40%	-	-	50

Course Description

The C programming language is a general-purpose, operating system-agnostic, and procedural language that supports structured programming and provides low-level access to the system memory

Course objectives

- Understand basics and fundamentals of C
- Understand the basics of file handling mechanisms

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Understand**[2] basic of programming language
- **CO2** **Demonstrate**[3] use of array and functions in c language
- **CO3** **Implement**[2] the algorithms for solving different problems

List of Experiments

- Program to illustrate Primitive Data types, variables, constants and expressions
- Program to illustrate Control Structures Program
- Write a program to design an arithmetic calculator using Switch-Case
- Program to illustrate String functions
- Write a program to find the number of vowels, consonants, digits in a string
- Write a program to calculate length of a String.
- Write a program to find the frequency of characters in a string.
- Write a program to find largest and smallest elements in an array.
- Write a program to copy an array to another array in reverse

- Write a program to concatenate arrays
- Write a Program to perform different Matrix Operations by using arrays
- Write a program to find a factorial of a number using functions
- Write a Program to calculate Area & perimeter of rectangle using function
- Write a Program o perform linear search using functions
- Write a Program to check whether a number can ne expressed as sum of two prime numbers
- Write a Program to Calculate Power using recursion
- Write a program to declare a structure 'Student' with name, age and marks of threesubjects as parameters. Compute the average of marks of 10 students.
- Write a program to perform addition of two numbers using command line arguments.
- Write a Program to pass the arrays and structure to the function.
- Write a Program to calculate the factorial value by using recursion.
- Write a Program to capitalize first letter of every word in a file.
- Write a Program to compare two strings using pointers
- Write a Program to find the sum of all matrix elements using pointers
- Write a Program to sort numbers in ascending order using pointers
- Write a Program to print number of lines of a file
- Write a Program to read Content of a file using getc ()
- Write a Program to capitalize the first letter of every word in a file
- Write a program to input the student data and perform the following operations by using structure and file handling concepts: Read from File, Write Data to File, Update the input data and delete the any asked student record:

Text Books

1. Kernighan Brain,The C Programming Language, Pearson Publication, 2nd Edition
2. Grey perry, C Programming Absolute beginner's guide, Que publication, 3rd Edition

References

1. Herbert Schildt, C the Complete Reference, Tata Mc-Graw Hills, 6th Editions.
2. Yashavant Kanetkar, Let us C, BPB Publication, 2007-7th Edition

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
U01VS002	Workshop Practice-II: Basic Engineering Practices	Theory	Practical	Tutorial	Theory	Practical	Tutorial
		-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
U01VS002	Workshop Practice-II: Basic Engineering Practices	Term Work	Min pass	Marks	Min pass	Total (Marks)
		50	40%	-	-	50

Course Description

This is a mainly practical course aimed to improve your career prospects within mechanical, manufacture or systems related areas within engineering.

Course objectives

- Understand the basic principles of mechanical engineering
- Demonstrate the techniques of smithy, carpentry in workshop.
- Demonstrate different techniques of welding and other processes in workshop.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1** **Acquire**[2] skills in basic engineering practices (Use of different types of machines, tools and equipment)
- **CO2** **Develop**[2] sheet metal, carpentry model, smithy, plumbing for specific applications.
- **CO3** **Practice**[3] fitting operation and able to produce assembly of two work pieces
- **CO4** **Perform**[2] different joining operations on metal.

List of Experiments

- Demonstration of different operation performed in smithy to make model like Hook.
- Demonstration of different sheet metal operations useful for sheet metal objects like tray etc and to make one simple job of sheet metal like tray, cover etc.
- Demonstration of different fitting operations and to make one job of fitting like marking, cutting, drilling, tapping, filing, fitting operations.
- Demonstration of different joining process (Spot, arc welding) for metals and to make one job of Arc welding like lap joint, butt joint and tee joint, corner joint in flat position.
- Demonstration of different carpentry operations with the help of hand tools and power tools.
- Site visit and its report.

Text Books

1. B. S. Raghuvanshi, A Course in Workshop Technology, Vol – I, Dhanapat Rai and Sons.
2. Hajara Chaudhari, Elements of Workshop Technology, Vol –I, Media Promoters.
3. Gupta and Kaushik, Workshop Technology, Vol – I, New Heights.

References

1. Chapman, Workshop Technology, Vol – I, The English Language Book Society.
2. H.S. Bawa Workshop Technology, Vol.-I by, TMH Publications, New Delhi.
3. P. M. Agrawal, Dr. V. J. Patel**,** CNC Fundamentals and Programming

Evaluation Scheme

1. TERM WORK assessment must be based on the overall performance of the student with every assignment graded from time to time.
2. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.
3. Based on above scheme grading and TERM WORK assessment should be done.

Course code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC001	National Cadet Corps (NCC)	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC001	National Cadet Corps (NCC)	50	40%	-	-	50

Course Description

This course provides exposure to the cadets in a wide range of activities. With a distinct emphasis on Social Services, Discipline and Adventure Training.

Pre-requisites:

- To study this course, a student must be medically fit.
- It is open for all.

Course Objectives

- Practicing the students and informing them about the legendary drills
- Students motivate a good citizen of India.
- Students awareness of National Unity and Integration
- Understand the importance of a weapon its detailed safety precautions necessarycfor prevention of accidents.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1: Practice**[1] togetherness in all walks of their life.
- **CO2: Perform**[2] foot drill and follow the different word of command
- **CO3: Think**[1] critically about different life related issues .

Suggestive List of Activities

- Introduction and General information about NCC
- National Integration & Awareness
- Drill
- Weapon Training (WT)
- Personality Development and Leadership.
- Disaster Management
- Social Awareness and Community Development
- Health & Hygiene
- Adventure Training
- Environment Awareness and Conservation

Text Books

1. Maliwal, B. N., (2015) Practical Military Science , Bareli , Prakash Book Depo.
2. Chauhan, Rajeev,kumar,(2021) NCC National Cadet Corps, Gwalior, Aakruti Publication.
3. NCC Directorate MP, CG,(2018) Cadet Hand book, Itawa, NCC Directorate MP, CG.
4. Mitra, Barun, K.,(2020) Personality Development and soft skills, Oxford University Press India.
5. Goyal, Hariom, (2016) Personality Development, Kalpana Publication.

References

1. Popil, Harvinder, and Sharma, Nirmal, (2018) Emergency First Aid Safety oriented, CRS Publishers.
2. Jain, N.C., and Sookshi, (2015) First Aid and Emergency case, AITBS Publishers.

Evaluation Scheme:

Sr. No.	Activity	Marks
1	Attendance Mark	40
2	Social activity	10
	Total	50

1. A cadet should be awarded 40 marks if he attends 100% of the parades. Marks should be awarded on the basis of following formula for awarding attendance marks.

$$\frac{\text{Parades Actually Attended x Total Attendance Points}}{\text{Total number of parades}} = \text{Attendance Marks}$$

$$Example: \frac{30 \times 40}{30} = 40$$

2. Participation in social work ex. For participation in social activity/ work as per instructions of Company Commanding Officer besides cleanliness of college premises, plantation of trees, traffic control, blood donation participation of cadet should be given marks out of 10.
3. Final Marking is to be done out of 50 Marks.
   (Atendance Marks (40) + Social Work Marks (10) = 50 Total Marks).
4. The Duration of One Practical Period will be 02.00 clock Hours.

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Course code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC002	National Service Scheme (NSS)	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC002	National Service Scheme (NSS)	50	40%	-	-	50

Course Description

This course provides an extension dimension to the higher education system to orient the student youth to community service while they are studying in educational institutions.

Pre-requisites:

- To study this course, a student must be medically fit.
- It is open for all.

Course Objectives

- Develop among them a sense of social and civic responsibility.
- Utilize their knowledge in finding practical solutions to individual and community problems.
- Develop competence required for group-living and sharing of responsibilities.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:** **Identify**[1] and solve the major social and environmental issues/challenges and equip the classroom learning to face those challenges.
- **CO2:** **Develop**[2] teacher competence, sensitivity and teacher motivation.
- **CO3:** **Perform**[1] NSS regular activities

List of Activities

- Introduction to National Service Scheme
- Introduction to National Integration
- Special Programme
  - Legal awareness
  - Health awareness
  - First-aid
  - Career guidance
  - Leadership training - cum - Cultural Programme
  - Globalization and its Economic Social Political and Cultural impacts.
- Special Camping programme
  - Nature and its objectives
  - Selection of camp site and physical arrangement
  - Organization of N.S.S. camp through various committees and discipline in the camp.
  - Activities to be undertaken during the N.S.S. camp.
  - Use of the mass media in the N.S.S. activities.
- N.S.S. Regular Activities
  - Traffic regulation
  - Working with Police Commissioner's Office
  - Working with Corporation of Chennai
  - Working with Health Department
  - Blind assistance
  - Garments collection
  - Non-formal education
  - 'Environmental Education, Awareness and Training (EEAT)'
  - Blood donation

Text Books

1. Nirmalya Kumar Sinha and Dr. Surajit Majumder , Text Book of National Service Scheme (Volume –I), Vidya Kutir Publications 2021.
2. Nirmalya Kumar Sinha and Dr. Surajit Majumder , Text Book of National Service Scheme (Volume –II), Vidya Kutir Publications 2021.

References

1. Gurmeet Hans ,Case material as Training Aid for field workers.
2. Kapil K.Krishan, Social service opportunities in Hospitals.
3. Ram Ahuja, Social Problems in India,..
4. Government of India, National Service Scheme Manual.
5. TISS Training Programme on National Programme scheme,.
6. TISS, Orientation Courses for N.S.S. Programme officers,.

Evaluation Scheme:

1. Participation in Regular Activities 40 Marks out of 50.

$$\frac{\text{Number of Activites Attended x Total Attendance Points}}{\text{Total number of Activities}} = \text{Attendance Marks}$$

$$Example: \frac{5 \text{ x } 40}{5} = 40$$

2. Participation in various Activities 10 Marks out of 50.
   - Participation in RD, SRD, NIC or any National Level Camp -10 Marks out of 10.
   - Participation in State Level Camp (Avhan, Utkartsh, Prearana Etc.) 08 marks out of 10.
   - Participation in Regional, University, district Level Camp/ Workshop 07 Marks out of 10.
   - Participation in Annual Special camp 06 Marks out of 10.

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Course code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC003	Yoga and Meditation	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC003	Yoga and Meditation	50	40%	-	-	50

Course Description

This course provides a form of exercise that uses specific body postures to achieve physical and mental health benefits, while meditation is a practice that can be done with or without movement in order to focus and calm the mind

Pre-requisites:

Course Objectives

- Stilling the mind and gaining insight, resting in detached awareness, and liberation (Moksha) from saṃsāra and duḥkha
- Sense of calm, peace and balance

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:** **Demonstrate**[2] basic skills associated with yoga activities including strength and flexibility, balance and coordination.
- **CO2:** **Demonstrate**[2] the ability to perform yoga movements in various combination and forms.
- **CO3:** **Identify**[1] a new perspective on stressful situations NSS regular activities

List of Activities

- Suryanamaskar
- Standing Asanas
  - Tadasana
  - Trikonasan
  - Padhamasan
  - Ardhachakrasan
  - Vrukashsan
- Sitting Asanas
  - Bhadrasan
  - Vajrasan
  - Utanmandukasan
  - Vakrasana
- Supine Asanas
  - Pawanmuktasan
  - Setubandhasana
  - Ardhahalasan
  - Shavasan
- Prone Asanas
  - Navakasana
  - Bhujangasan
  - Dhanurasana
  - Makrasana
  - Shalbhasana
- Pranayama
  - Bhastrika
  - Kapal Bharti
  - Ujjai
  - Anulom-Vilom
  - Sheetali
  - Bhramari
- Meditation

Text Books

1. Iyengar,B.K.(2008).Light on Yoga.Orient Long man Pvt.Ltd.Mumbai.
2. Iyengar,B.K.(2008).Light on Pranayama. Orient Long man Pvt. Ltd. Mumbai.
3. Iyengar,B.K.(2008).Light on Astanga Yoga.Alchemy Publishers. NewDelhi.

References

1. Iyengar, B.K.(2008).Yoga the Path to Holistic Health. Dorling Kinders ley.London.
2. Gharote, M. L. (2013). Guidelines for Yogic Practices. The Lonavla Yoga Institute. India.

Evaluation Scheme

1. The 50 marks would be evaluate based on the scheme:

Sr. No.	Activity	Marks
1.	Practice and Performance	10
2.	Regularity	10
3.	Discipline	05
4.	Suryanamskar : **Compulsory**	05
5.	Standing & Siting asanas: **Any two**	05
6.	Supine & Prone asanas : **Any two**	05
7.	Pranayama :**Any two**	05
8.	Mediation	05
	Total	**50**

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC004	Physical Fitness	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC004	Physical Fitness	50	40%	-	-	50

Course Description

This course provides a execute daily activities with optimal performance, endurance, and strength with the management of disease, fatigue, and stress and reduced sedentary behaviour.

Pre-requisites:

Course Objectives

- The main objectives of physical education are to: develop motor abilities like strength, speed, endurance, coordination, flexibility, agility and balance, as they are important aspects for good performance in different games and sports.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:** **Reduce**[1] your risk of a heart attacks.
- **CO2:** **Manage**[1] your weight better.
- **CO3:** **Manage**[1] a lower blood cholesterol level and lower the risk of type 2 diabetes and some cancers.

List of Activities

- Endurance
  - 5 Minute run
  - 12Min.RunWalk
- Speed
  - 40 Metre Sprint Test
  - Shuttle Run Test
  - Flying 30 Metre Test
  - Rope Skipping
- Agility
  - Zig-Zag Run
  - 'T' Drill Test
  - Burpee Test
- Strength
  - Sit-ups
  - Push-up
  - Standing Long
  - Jump Test
  - Bench Press Test
- Flexibility
  - Sit & rich
  - Modified Sit & Reach Test
  - Static Flexibility Test – Shoulder

Text Books

1. Kansal, D. K. Textbook of Applied Measurement Evaluation & Sports Selection, Sports and Spiritual Science Publication, NewDelhi 2008.
2. Lipman, H. A., Measurement and Evaluation in Physical Education, Friends Publication, NewDelhi 2009.
3. Miller,T. NSCA's Guide to Testand Assessment, Human Kinetics,USA 2012.

References

1. Morrow, J., Jackson, A., Disch, J., & Mood, D. Measurement and Evaluation In human Performance, Human Kinetics.USA 2005.
2. Scott, M. G. & French, E. (2009). Measurement and Evaluation in Physical Education, Sports Educational Technologies, New Delhi 2009.
3. Yobu, A., Test Measurement and Evaluation in Physical Education and Sports.Friends Publication. NewDelhi 2010.

Evaluation Scheme

1. The 50 marks would be evaluate based on the scheme:

Sr. No.	Activity	Marks
1.	Practice and Performance	10
2.	Regularity	10
3.	Discipline	05
4.	Endurance :**Any one activity**	05
5.	Speed : **Any two activity**	05
6.	Agility :**Any two activity**	05
7.	Strength :**Any two activity**	05
8.	Flexibility :**Any two activity**	05
	Total	**50**

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC005	Performing Arts-Music	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC005	Performing Arts-Music	50	40%	-	-	50

Course Description

This course is designed to develop musical skills that will lead to a thorough understanding of musical Instruments. Students are prepared to take the Music Theory Final when they have completed the course.

Pre-requisites:

Course Objectives

- This is a generic course and provides an opportunity to the students of other disciplines to have an introduction to the nuances of music and its appreciation. Basic voice culture, learning simple compositions in the prescribed ragas and will understand the basics of Guitar and Keyboard.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1:** **Demonstrate**[3] a grounding in musical instrument studies
- **CO2:** **Apply**[2] theoretical concepts and approaches derived from considering musical instruments from varied perspectives
- **CO3:** **Understand**[2] and learn using the Notes and Octave.
- **CO4:** **Demonstrate**[3] to perform on the notes.

List of Activities

- Understanding of Music – Guitar and Keyboard.
- Differentiating blowing, String, lite, String Instruments
- Holding Of Guitar, Care of Guitar. Holding Of Keyboard, Care of Keyboard.
- Pick and Its Holding.
- Tuning of 6 strings of guitar.
- Playing on all notes on Keyboard.
- Playing of odd notes on Keyboard.
- Playing of even notes on Keyboard.
- Up down strokes of Guitar.
- Spiral up down strokes on guitar on 12 frets.
- C scale form 5th string. (Ascending, Descending)
- Playing of L no. 1 (Birthday Song)
- Playing of L no. 2(Jana Gana Mana)

Text Books

1. Kansal, D. K. Textbook of Applied Measurement Evaluation & Sports Selection, Sports and Spiritual Science Publication, NewDelhi 2008.
2. Lipman, H. A., Measurement and Evaluation in Physical Education, Friends Publication, NewDelhi 2009.
3. Miller,T. NSCA's Guide to Testand Assessment, Human Kinetics,USA 2012.

References

1. Morrow, J., Jackson, A., Disch, J., & Mood, D. Measurement and Evaluation In human Performance, Human Kinetics.USA 2005.
2. Scott, M. G. & French, E. (2009). Measurement and Evaluation in Physical Education, Sports Educational Technologies, New Delhi 2009.
3. Yobu, A., Test Measurement and Evaluation in Physical Education and Sports.Friends Publication. NewDelhi 2010.

Evaluation Scheme

1. The 50 marks would be evaluate based on the scheme:

Sr. No.	Activity	Marks
1.	Practice and Performance	10
2.	Regularity	10
3.	Discipline	10
4.	Playing on all notes on Keyboard.	10
5.	Playing on all notes on Guitar.	10
	Total	**50**

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
U04CC006	Fine Arts	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		
		Term Work	Min pass	Marks	Min pass	Total (Marks)
U04CC006	Fine Arts	50	40%	-	-	50

Course Description

This course aims at providing students with basic understanding of fine arts skills and knowledge. The main purpose of the subject is to help the students in understanding the basic concept of Art, origin, history, drawing & painting, etc. and how creativity if fostered professionally can result in beautiful designs for today's scenario.

Pre-requisites: Basic Drawing & Coloring

Course Objectives

- The knowledge gained with this course will help students to foster creativity and self-expression (basic understanding of color concept and application in relation to different use cases)
- Techniques studied from Visual arts should be used by the students in their respective field to make a more impactful presentation overall. Students will learn to appreciate art in a more critically artistic way.

Course Outcomes: After the successful completion of the course students will able to:

- **CO1: Appreciate**[1] Traditional Indian Art
- **CO2: Understand**[1]fundamentals of Visual Arts.
- **CO3: Implement**[2]creative skills in Drawing & Painting
- **CO4: Create**[3] Various day to day articles in a creative format.

List of Activities

- Performing Secondary Research on Indian Art forms
- Performing Secondary Research on Traditional Painting Techniques of India
- Assignment on Elements of Design
- Assignment on Principles of Design
- Assignment on Basics of Drawing
- Assignment on Basics of Painting
- Prepare Commercial Art article

Text Books

1. Ncert ,An Introduction To Indian Fine Arts Part 1 ,National Council of Education Research and Training,2019.
2. Ncert ,An Introduction To Indian Fine Arts Part 2 ,National Council of Education Research and Training,2021.

References

1. Dasgupta, S.N.: Fundamentals of Indian Art
2. Dr. Kurt Herbert ,Artists Technique,

Evaluation Scheme

1. The 50 marks would be evaluate based on the scheme:

Sr.No	Developing Skills at Grade Level	Excellent	Very Good	Good	Satisfactory	Developing
1.	Understanding of Art	10	8	6	4	2
2.	Creativity	10	8	6	4	2
3.	Understanding of Elements	10	8	6	4	2
4.	Understanding of Principles	10	8	6	4	2
5.	The Hand	10	8	6	4	2

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