Sanjay Ghodawat University Kolhapur



School of Engineering and Technology
Department of Civil Engineering

B. Tech. Civil Engineering

Curriculum Structure (R25)

Semester: I-II

Programme Structure for B Tech.: First Year Civil Engineering (R25)

Semester I: Teaching Scheme

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total credits
USTBS101	Linear Algebra	3	-	1	3	-	1	4
USTBS102	Engineering Physics	3	-	-	3	-	-	3
USTES101	Engineering Graphics	3	-	-	3	-	-	3
USTES105	Basic Electrical and Electronics for Civil Engineers	2	-	-	2	-	-	2
USTES003	Design Thinking	2	-	-	2	-	-	2
USTBS103	Engineering Physics Lab	-	2	-	-	1	-	1
USTES102	Engineering Graphics Lab	-	2	-	-	1	-	1
USTES106	Basic Electrical and Electronics for Civil Engineers Lab	-	2	-	-	1	-	1
USTES004	Design Thinking Lab	-	2	-	-	1	-	1
USTIK001	Indian Science, Engineering and Technology (Past, Present and Future)	2	-	-	2	-	-	2
UHSVE001	Constitution of India	2	-	-	2	-	-	2
UISCC0XX	Co-curricular courses I	-	4	-	-	2	-	2
UHSVE005	Universal Human Values	-	-	-				Audit Course
	Total	**17**	**12**	**1**	**17**	**6**	**1**	**24**

- 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				SEE	Term work / Tutorial	Practical Oral/ POE	
		T1	T2	FET	Total				
USTBS101	Linear Algebra	10	10	5	25	50	25	-	100
USTBS102	Engineering Physics	10	10	5	25	50	-	-	75
USTES101	Engineering Graphics	10	10	5	25	50	-	-	75
USTES105	Basic Electrical and Electronics for Civil Engineers	-	10	5	15	35	-	-	50
USTES003	Design Thinking	-	10	5	15	35	-	-	50
USTBS103	Engineering Physics Lab	-	-	-	-	-	25	-	25
USTES102	Engineering Graphics Lab	-	-	-	-	-	25	-	25
USTES106	Basic Electrical and Electronics Engineering Lab	-	-	-	-	-	25	-	25
USTES004	Design Thinking Lab	-	-	-	-	-	25	-	25
USTIK001	Indian Science, Engineering and Technology (Past, Present and Future)	-	10	5	15	35	-	-	50
UHSVE001	Constitution of India	-	10	5	15	35	-	-	50
UISCC0XX	Co-curricular courses I	-	-	-	-	-	50	-	50
UHSVE005	Universal Human Values	-	-	-	-	-	-	-	Audit Course
								Total	**600**

Programme Structure for B Tech.: First Year Civil Engineering (R25)
Semester II: Teaching Scheme

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total Credits
USTBS201	Calculus and Statistics	3	-	1	3	-	1	4
USTBS204	Engineering Chemistry	3	-	-	3	-	-	3
USTES201	Engineering Mechanics	3	-	-	3	-	-	3
UCVPC201	Elements of Civil Engineering	2	-	-	2	-	-	2
USTVS204	Basic Construction Practices	3	-	-	3	-	-	3
USTBS205	Engineering Chemistry Lab	-	2	-	-	1	-	1
USTES202	Engineering Mechanics Lab	-	2	-	-	1	-	1
UCVPC202	Elements of Civil Engineering Lab	-	2	-	-	1	-	1
UHSAE001	Professional Communication	1	2	-	2	-	-	2
UISCC0XX	Co-curricular Courses II	-	4	-	-	2	-	2
Total		**15**	**12**	**01**	**16**	**05**	**01**	**22**

Semester II: Evaluation Scheme

Course Code	Course Name	Theory Marks					Practical Marks		Total
		Internal Assessment				SEE	Term work/ Tutorial	Practical Oral/POE	
		T1	T2	FET	Total				
USTBS201	Calculus and Statistics	10	10	5	25	50	25	-	100
USTBS204	Engineering Chemistry	10	10	5	25	50	-	-	75
USTES201	Engineering Mechanics	10	10	5	25	50	-	-	75
UCVPC201	Elements of Civil Engineering	-	10	5	15	35	-	-	50
USTVS204	Basic Construction Practices	10	10	5	25	50	-	-	75
USTBS205	Engineering Chemistry Lab	-	-	-	-	-	25	-	25
USTES202	Engineering Mechanics Lab	-	-	-	-	-	25	-	25
UCVPC202	Elements of Civil Engineering Lab	-	-	-	-	-	25	-	25
UHSAE001	Professional Communication	-	10	5	15	35	-	-	50
UISCC0XX	Co-curricular Courses II	-	-	-	-	-	50	-	50
								Total	**550**

Exit Option:

- Students will have the flexibility to enter the programme in odd semesters and exit the 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 4-8 credits in work-based vocational courses or internship / Apprenticeship offered during summer vacation in addition to 8 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
USTBS101	Linear Algebra	03	-	01	03	-	01

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Practical/ Tutorial Marks		Semester End Exam (SEE)		Total Marks
		T1	T2	FET	Total	Min pass	Term-work /Tutorial	Min. Pass	Marks	Min pass	
USTBS101	Linear Algebra	10	10	5	25	40%	25	40%	50	40%	100

Course Description

This course provides a fundamental understanding of Linear Algebra, essential for various engineering and scientific applications. It covers determinants, matrices, and their role in solving systems of equations. The course introduces vector spaces, subspaces, and orthogonality concepts, along with their applications in engineering problems. Vector differentiation is explored to understand velocity, acceleration, and gradient-related concepts. Additionally, the course includes complex numbers and double integrals, equipping students with essential mathematical tools for problem-solving in advanced technical fields.

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

Course Objectives

- To introduce the fundamental concepts of determinants and matrices for solving linear equations.
- To develop an understanding of vector spaces, subspaces, and their applications.
- To explore vector differentiation and its role in physics and engineering.
- To familiarize students with complex numbers and double integrals for advanced mathematical applications

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

- **CO1** **Apply**[2] determinant and matrix operations to solve systems of linear equations.
- **CO2** **Demonstrate**[3] an understanding of vector spaces and their properties, including basis and dimension.
- **CO3** **Compute**[2] derivatives of vectors and analyze motion in terms of velocity and acceleration.
- **CO4** **Utilize**[2] complex numbers and double integration techniques in mathematical problem-solving.

Module	Unit	Description	Hours
1.0		**Determinant**	
1	1.1	Determinants, Minors and Cofactors, Laplace's expansion, Properties of determinant.	9
	1.2	Multiplication of determinant, Solution of a system of linear equations by Cramer's rule (three variables), Adjoint and Reciprocal determinant.	
2.0		**Matrix**	
2	2.1	Rank of matrix, Consistency of linear system of equations, solution of system of linear homogeneous and non-homogeneous equations.	9
	2.2	Eigen value, Eigen vectors, Cayley Hamilton's theorem (Without proof), Power and inverse of matrix by Cayley Hamilton theorem.	
3.0		**Vector Space**	
3	3.1	Vector spaces, subspaces, span, linear dependence and independence, basis and dimension,	9
	3.2	Orthogonality - Orthogonal vectors and subspaces, cosines and projections onto lines, orthogonal bases and Gram – Schmidt.	
4.0		**Vector Differentiation**	
4	4.1	Differentiation of vectors, normal, & tangential components of velocity and acceleration	9
	4.2	Gradient of scalar point function, directional derivative, divergence of vector point function, curl of a vector point function, Irrotational and solenoidal vector field.	
5.0		**Complex Number and Double Integral**	
5	5.1	Complex Number: Modules and arguments, types of complex number, DeMoiver's theorem (without proof), and roots of complex number.	9
	5.2	Double Integral: Double integral, Evaluation of double integration.	

Text Books

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

References

1. Erwin Kreyszing and Edward J. Norminton, Advanced Engineering Mathematics, 10th edition, John Willey & Sons, Inc. Publication.
2. Dass, H.K., and Er. Rajnish Verma, Higher Engineering Mathematics, S. Chand Private Ltd., (2011).
3. Glyn James, Advanced Modern Engineering Mathematics, 3rd Edition, Pearson Education, (2012).
4. Peter V and O'Neil, Advanced Engineering Mathematics, 7th Edition, Cengage learning, (2012).

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. Fifth module will be assessed for 5 marks separately.

3. Tutorial should be assessed based on accuracy, completeness, conceptual understanding, problem-solving approach, clarity of explanation, and presentation quality.
4. Term work assessment shall be based on the overall performance of the student with every tutorial graded from time to time.
5. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.

Semester End Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of Semester End 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
USTBS102	Engineering Physics	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Semester End Exam (SEE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
USTBS102	Engineering 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 polarization etc.
- Basic of magnetism and different phases of matter.

Course Objectives:

- To introduce students to the basic principles of Ultrasonics and acoustics and its application.
- To study in details the concepts of interference, diffraction and polarization 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** **Understand**[2] the basic concept of oscillations apply relevant equations.
- **CO2** **Explain**[3] the nature of light and its theory
- **CO3** **Discuss**[2] The basic theory and principles of production of ultrasonic sound and acoustics.
- **CO4** **Understand**[2] and **Explain**[3] Particle nature of light and basic of quantum mechanics.
- **CO5** **Apply**[4] Knowledge of magnetism and crystallography in Engineering field.

Module	Unit	Description	Hours
1.0		**Oscillations and Waves**	**9**
	1.1	Introduction, Oscillations, simple harmonic motion, free oscillations, damped oscillations, forced oscillations, resonance, coupled oscillations,	
	1.2	waves: types of waves, reflections and transmission of waves at boundary, principle of superposition, stationary waves, superposition of perpendicular shms, dispersions.	
2.0		**Light**	**9**
	2.1	Introduction, nature of light ,the velocity of light, optical medium, homogenous isotropic medium, reflection and refraction, total internal reflection, absorption, wavefront and the ray, Mathematical representation of plane wave, light is an electromagnetic wave,	
	2.2	Interference of light waves, Young double slit experiment, wave Trans-light from common sources, coherence, Double slit experiment, dispersion, and scattering.	
3.0		**Ultrasonic and Acoustics**	**9**
	3.1	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.	
	3.2	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.	
4.0		**Quantum Mechanics**	**9**
	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**
	5.1	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, X-ray diffraction: Bragg‟s law and powder method.	

Text Books

1. A Textbook of Applied Physics, Volume 1, A. K. Jha, I. K. International Pvt Ltd,2009
2. Applied Physics for Engineers, Mehta Neeraj, PHI Learning Pvt. Ltd.,2011
3. Applied physics, Paul E. Tippens, Gregg Division, McGraw-Hill Book Co.,1985

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.

Semester End Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of Semester End 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
USTES101	Engineering Graphics	03	--	-	03	--	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Semester End Exam (SEE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
USTES101	Engineering Graphics	10	10	5	25	40%	50	40%	75

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

Module	Unit	Description	Hours
1.0		**Fundamentals of Engineering Graphics**	**9**
	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**	**9**
	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**	**9**
	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**	**9**
	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**	**9**
	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. 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.

Semester End Examination:

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of Semester End 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.

USTES105: Basic Electrical and Electronics for Civil Engineers

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
USTES105	Basic Electrical and Electronics for Civil Engineers	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)				End Semester Exam (ESE)		Total (Marks)
		T1	FET	Total	Min pass	Marks	Min pass	
USTES105	Basic Electrical and Electronics for Civil Engineers	10	5	15	40%	35	40%	50

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 civil discipline 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 study importance of safety and protection in electrical wiring.
- To acquire the basic knowledge of analog and digital devices and its functioning
- To acquire the basic knowledge and operations of measuring instruments

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

- **CO1: Illustrate**[3] basic components in DC and AC circuits.
- **CO2: Describe**[2] wiring system with safety and protection.
- **CO3: Demonstrate**[2] basic electronic devices and their applications
- **CO4:Illustrate**[3] basic sensors in civil engineering

Course Contents

Module	Unit	Description	Hours
1.0		**DC& AC Circuits**	**6**
	1.1	Types of materials based on resistivity. Concepts of E.M.F., potential difference and current, resistance, effect of Electrical circuit elements (R, L and C), voltage and current sources, Faraday's Law, Kirchhoff's current and voltage laws, DC response of RL & RC circuits.	
	1.2	Representation of sinusoidal waveforms, peak and RMS values, single phase and three phase supply, Phasor representation of AC quantities, real power, reactive power, apparent power, power factor.	
2.0		**Electrical wiring with safety and protection**	**6**
	2.1	Electrical Wiring: Connectors and switches, systems of wiring, domestic wiring installation, subcircuits in domestic wiring, simple control circuit in domestic installation, industrial electrification. Illumination: Types of lamps, fixtures and reflectors, illumination schemes for domestic, industrial and commercial premises, Lumen requirements for different categories.	
	2.2	Safety and Protection: Safety, electric shock, first aid for electric shock and other hazards, safety rules, grounding, importance of grounding, equipment grounding for safety, circuit protection devices, fuses, MCB, ELCB and relays.	
3.0		**Semiconductor devices and applications**	**6**
	3.1	Junction Diode Characteristics and Special Semiconductor Devices – Zener, LED, Tunnel, Photodiode, Rectifiers, Voltage regulations, Operational Amplifier – Introduction and Applications.	
	3.2	Introduction to number system, Basic gates, Universal gates with truth table	
4.0		**Measuring instruments**	**6**
	4.1	Introduction to Moving coil and moving iron meters, Ammeter, Voltmeter, Wattmeter, Energy meter.	
	4.2	Cathode Ray Oscilloscope- Block diagram, Measurement of voltage and frequency, Signal Generator, Digital Multimeter-Block diagram and its operation. DSO- Block diagram- Data acquisition	
5.0		**Sensors in Civil Engineering**	**6**
	5.1	Operating Principle and construction of sensors: Strain gauges, Tilt Sensors, Temperature sensors, Displacement sensors, Load cells, Accelerometer, Humidity and Gas sensors.	
	5.2	Overview of applications: Infrastructure Monitoring, Environmental Monitoring	

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. A.K.Sawhney,"Sensors& Instrumentation".Dhanpat Rai & Co.

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 beTest/ 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 07 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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USTES003: **Critical Thinking, Design Thinking, Leadership & Teamwork**

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
USTES003	Design Thinking	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Semester End Exam (SEE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
USTES003	Design Thinking	-	10	5	15	40%	35	40%	50

This course introduces students to the principles and practices of Design Thinking, a human-centered, iterative approach to problem-solving that fosters creativity, collaboration, and innovation. It emphasizes empathy, ideation, prototyping, and testing as key stages in developing solutions that address real-world challenges.

Pre-requisites for the course Basics of Mathematics & Science Knowledge

Course Objectives:

- Explain the benefits of Design Thinking in a structured approach of solving complex problems through capstone projects
- Promote the design thinking strategies for analytical and creative thinking through the product development process
- Offer the basic principles and methodologies of Critical Thinking for optimal Decision Making in real-world problems
- Introduce different leadership styles and their effectiveness in various organizational contexts
- Enhance the communication proficiency of learners

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

- **CO1** Develop a solution framework with design thinking principles (BL3)
- **CO2** Categorize Design thinking in real-world applications along with Waterfall and Agile models (BL4)
- **CO3** Relate the Critical thinking and Design thinking framework in problem-solving (BL2)
- **CO4** Build the strategies for Teamwork and Leadership (BL3)
- **CO5** Utilize communication proficiency in the Professional space (BL3)

Course Contents

Module	Unit	Description	Hours
1.0		**Design Thinking Fundamentals and Framework**	**6**
	1.1	Unique characteristics of Design Thinking, Difference between Creativity and Innovation, Categories and misconceptions of creativity, Resilience in problem-solving, Analytical Thinking – Driven by Design Thinking, Case study on collaborative creativity enhanced by Design Thinking, Waterfall models and Design Thinking, Agile Development models, Agile process integrated with Design Thinking, Design Thinking based Product development - Design methodology, Prototyping, UX design, Value proposition	
2.0		**Design Thinking in Creativity & Innovation**	**6**
	2.1	Real-world Problem Statements will be offered to batches and Example solutions will be demonstrated	
3.0		**Design Thinking Based Project Assignments**	**6**
	3.1	Introduction to Critical Thinking, Styles and challenges of Critical Thinking, Benefits of Critical Thinking, Identifying & clarifying issues and arguments, Types of Arguments, Common patterns of Deductive reasoning & Inductive reasoning, Reasoning with Statistics, Fallacies of Relevance, Fallacies of Insufficient Evidence, Evaluating arguments, Critical Thinking models, Principles of Decision making, De Bono's Thinking hats, Effective Argument Writing, Critical Thinking based case study analysis, Analytical view of Science & Pseudoscience based thinking	
4.0		**Critical Thinking**	**6**
	4.1	Defining leaders and leadership, Types of leaders and leadership styles, Understanding the people, personalities and abilities, Active listening, Non - verbal communication, Feedback, Clarity, Effective teams, Stages of team development, Understanding the psychology of change for individuals and teams, Personal resilience and well- being, Feedback and feed forward, Leaders and teams: Working effectively towards common goals, Role of integrity in leadership, Embracing growth mindset in leadership, Conflictresolution and Managing team dynamics	
5.0		**Leadership and Teamwork**	**6**
	5.1	Verbal and non-verbal communication, LSRW skills, Assertive communication, Persuasion Skills, Interpersonal Skills, Cross-cultural communication, Emotional intelligence, Self - awareness, Interpreting body language, Active listening, Personality development, Time management and Goal setting	

Textbooks:

1. "Thinking Skills - Critical Thinking and Problem Solving" by Geoff Thwaites and John Butterworth
2. "Critical Thinking A Student's Introduction" by Gregory Bassham William Irwin, Henry Nardone, James M. Wallace
3. "Leadership: Theory and Practice" by Peter G. Northouse
4. "Innovation and Entrepreneurship" by Peter F. Drucker

Reference Books:

1. "Critical Thinking: Tools for Taking Charge of Your Learning and Your Life" by Richard Paul and Linda Elder
2. "The 7 Habits of Highly Effective People" by Stephen R. Covey
3. "Design Thinking: Understanding How Designers Think and Work" by Nigel Cross
4. "Where Good Ideas Come From" by Steven Johnson

E-Books / MOOCs/ NPTEL

1. eBook: "The Innovator's Dilemma" by Clayton Christensen Online Resource: Harvard Business Review's Innovation section (https://hbr.org/topic/innovation)

Scheme of Continuous Internal Evaluation (CIE):

Components	Assessments	Total Marks
Marks	MCQ	100

Rubrics: Levels	Target
<40	Participation
41-70	Completion
71 - 100	First class

USTBS103: Engineering Physics Lab

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
USTBS103	Engineering Physics Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
USTBS103	Engineering Physics Lab	25	40%	-	-	25

Course Description-

This laboratory course complements the Engineering Physics theory curriculum by providing hands-on experience with optical, electrical, and magnetic instruments. Students will conduct practical experiments to verify fundamental physical principles and develop essential measurement and observational skills**.**

Pre-requisites Basic knowledge of 12th-standard physics (Optics, Electricity, and Magnetism).

Course Objectives-

- To train students in the precise use and handling of physical measuring instruments.
- To experimentally verify theoretical concepts related to light, lasers, and magnetism.
- To develop analytical skills through observation, data collection, and physical property determination.

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 **Engineering Physics – USTBS102**

1. Calculation of wavelength of light using diffraction grating
2. Determination of specific rotation using polarimeter
3. Compound pendulum
4. Study photoelectric effect using photometer
5. Determination of Plank's constant by LED
6. Study of B-H curve
7. Determination of Miller indices from given planes
8. Determination of crystal structure using XRD

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.

USTES102: Engineering Graphics Lab

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
USTES102	Engineering Graphics Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
USTES102	Engineering Graphics Lab	25	40%	-	-	25

Course Description-

This lab provides practical training in engineering drafting and visualization. Students will transition from foundational drawing concepts, focusing on creating accurate 2D orthographic projections, geometric constructions, and 3D isometric models**.**

Pre-requisites - Basic understanding of geometry and concurrent enrollment in Engineering Graphics (USTES101).

Course Objectives

- To develop proficiency in using modern CAD software for technical engineering drawings.
- To enhance spatial imagination and the ability to interpret multi-view projections.
- To train students to produce industry-standard detailed drawings and 3D models.

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 – USTES101**

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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USTES106: Basic Electrical and & Electronics for Civil Engineers Lab

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
USTES106	Basic Electrical and Electronics for Civil Engineers Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
USTES106	Basic Electrical and Electronics for Civil Engineers Lab	25	40%	-	-	25

Course Description-

This practical course introduces civil engineering students to fundamental electrical and electronic circuits, components, and measurement tools. It emphasizes hands-on familiarity with logic gates, basic electronic devices, and circuit laws relevant to interdisciplinary engineering applications**.**

Pre-requisites - High school physics and mathematics.

Course Objectives

- To familiarize students with basic electrical and electronic components and their operations.
- To develop skills in utilizing standard measuring instruments and observing circuit behavior.

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

- **CO1:Illustrate[2]** 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 devices.

List of Experiments

All the experiments will be based on the course content of **Basic Electrical and Electronics for Civil Engineers – USTES105**

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
USTES004	Design Thinking Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		FEP Marks	Min pass	Marks	Min pass	
USTES004	Design Thinking Lab	25	40%	-	-	25

Course Description-

A project-based laboratory where students actively apply the Design Thinking framework to solve real-world problems. Through iterative activities like empathy mapping, brainstorming, customer journey mapping, and rapid prototyping, students will develop and test user-centric solutions**.**

Pre-requisites- None

Course Objectives

- To instill a human-centered approach to identifying and solving complex problems.
- To foster teamwork, creative ideation, and effective storytelling skills.
- To provide practical experience in building prototypes and iterating designs based on user feedback.

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

- **CO1** **Apply**[3] the Design Thinking process to develop and prototype user-centric solutions.
- **CO2** **Test**[6] and refine prototypes based on user feedback and iterative design improvements.

List of Experiments

- **Empathy Mapping** – Conduct user research and create an empathy map to understand user needs.
- **Problem Definition** – Identify a real-world problem and define a problem statement using the "How Might We" approach.
- **Brainstorming & Ideation** – Use techniques like mind mapping and SCAMPER to generate multiple solution ideas.
- **Customer Journey Mapping** – Analyze user experience and identify pain points in an existing system.
- **Storyboarding** – Create a visual storyboard to illustrate the user's interaction with the proposed solution.
- **Rapid Prototyping** – Develop a low-fidelity prototype using paper, sketches, or digital tools.
- **Feedback & Testing** – Conduct user testing on the prototype and document key insights for improvement.
- **Iterative Design** – Modify the prototype based on feedback and test again for enhanced usability.
- **Pitching the Solution** – Present the refined solution using storytelling techniques and visual aids.

- **Case Study Analysis** – Analyze a successful design-thinking-based innovation and present findings.

Text Books

1. Tim Brown, "Change by Design", 1st Edition, Harper Business, 2009.
2. Jeanne Liedtka, Tim Ogilvie, "Design Thinking for the Greater Good", 1st Edition, Columbia University Press, 2017

References

1. Don Norman, "The Design of Everyday Things", Revised Edition, Basic Books, 2013.
2. **IDEO.org**, "Design Kit: The Human-Centered Design Toolkit", 1st Edition, IDEO, 2015.

In Semester Evaluation Scheme

- FEP assessment must be based on the overall performance of the student with every assignment/practical graded from time to time.
- The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.

USTIK001: Indian Science, Engineering and Technology (Past, Present and Future)

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
USTIK001	Indian Science, Engineering and Technology (Past, Present and Future)	02	-		02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Semester End Exam (SEE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
USTIK001	Indian Science, Engineering and Technology (Past, Present and Future)	-	10	5	15	40%	35	40%	50

Course Description

The objective of this course is to provide an exposure to the development of Science and Technology in India, and is primarily meant for teachers and research scholars in various universities and colleges.

Prerequisites: -Nil

Course Objectives

- To familiarize learners with major sequential development in Indian science, engineering and technology.
- To review & strengthen the ancient discovery and research in physics, chemistry, maths, metallurgy, astronomy, architecture, textile, transport, agriculture and Ayurveda etc.
- To help students to trace, identify and develop the ancient knowledge systems to make meaningful contribution to development of science today.

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

- **CO1: Create**[3] awareness amongst the youths about Indian Traditional Knowledge; Science and Practices
- **CO2: Review**[3] the Ancient Indian Science (Physics, Chemistry, Maths)
- **CO3: Explane**[3] Ancient Indian Science (metallurgy, Architecture)
- **CO4: Demonstrate**[3] Ancient Indian Science (Ayurveda & Yoga)

Course Contents

Module	Unit	Description	Hours
1.0		**Indian Traditional Knowledge; Science and Practices**	**6**
	1.1	Introduction to the Science and way of doing science and research in India, Ancient Science in Intra & Inter Culture Dialogue & coevolution. Traditional agricultural practices, Traditional water-harvesting practices, Traditional Livestock and veterinary Sciences Traditional Houses & villages, Traditional Forecasting,	
	1.2	Traditional Ayurveda & plant-based medicine, Traditional writing Technology	
2.0		**Ancient Indian Science (Physics, Chemistry, Maths)**	**6**
	2.1	Physics in India: Vaisheshika darshan Atomic theory & law of motion, theory of panchmahabhoota, Brihath Shathaka (divisions of the time, unit of distance), bhaskarachaya(theory of gravity, surya siddhanta & sidhanta shriomani), Lilavati (gurutvakashan Shakti).	
	2.2	Chemistry in India Vatsyayana, Nagarjuna,Khanda, Al-Biruni, Vagbhaṭa – building of theras-shala (laboratory), working arrangements of ras-shala, material and equipment, Yaśodhara Bhaṭṭa-process of distillation, apparatus, saranasamskara, saranataila	
	2.3	Mathematics in India: Baudhayana‟s Sulbasutras, Aryabhaṭa, Bhaskaracharya-I, Severus Sebokht, Syria, Brahmagupta, Bhaskaracharya-II, Jyeṣṭhadeva	
3.0		**Ancient Indian Science (metallurgy, Architecture)**	**6**
	3.1	Metallurgy in India: Survarṇa(gold) and its different types, prosperities, Rajata(silver),Tamra(copper), Loha(iron), Vanga(tin), Naga / sisa(lead), Pittala(brass)	
	3.2	Architecture in India: Nagara (northern style), Vesara (mixed style), and Dravida (southern style), Indian vernacular architecture, Temple sytle, cave architecture, rock cut architecture, kalinga architecture, chandels architecture, rajput architecture, jain architecture, sikh architecture, Maratha architecture Indo-Islamic architectural, Indo-Saracenic revival architecture, Greco Buddhist style.	

4.0		**Ancient Indian Science (Textile, Agriculture)**	**6**
	4.1	Textile Technology in India: Cotton (natural cellulose fiber), silk, wool (natural protein fibers), bast and leaf fibers, mridhudhautadhupitambaram (meaning a practice of fumigating the fabric with incence smoke before use as a part of the finishing process), sitadhautavasanayugala (bleached white–a finishing process); suchhastah, sutradharah (needle and thread – tools for stiching). dyeing, washing spinning and weaving technology,	
	4.2	Agriculture in India: krishisuktas, Krishiparashara, Brihatsamhita, Types of crops, Manures, Types of land- devamatruka, nadimatruka, use of animals in warfare, animal husbandry, Animals for medicines.	
5.0		**Ancient Indian Science (Ayurveda & Yoga)**	**6**
	5.1	Ayurveda for Life, Health and Well-being: Introduction to Ayurveda: understandingHuman body and Pancha maha bhuta, the communication between body & mind, health regimen for wellbeing,	
	5.2	Introduction to yoga (raja yoga, astang yoga, gyan yoga), understanding of Indian psychological concept, consciousness, tridosha & triguna.	

Text Books

1. Prof. B Mahadevan, Textbook on IKS, IIM Bengaluru.
2. Nair, Shantha N. Echoes of Ancient Indian Wisdom. New Delhi: Hindology Books, 2008.
3. SK Das, The education system of Ancient Hindus, Gyan publication house, India

References

1. A Gosh, History of Science in India (Volume-I Part-II Astronomy), the national academy of science, India & the ramkrishna mission institute of culture, 2014
2. Dharmpal, Indian science and technology in the eighteen century, rashtrottahana sahitya, 1983
3. S Biswal, B L ray, Vedic Science and technology, DK Print world, 2009
4. A.K Bag, History of technology in Indian (Set 3 vol), Indian Nation Science Academy, 1997.

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.

Semester End Examination

1. Question paper will be of 35 marks comprised of 5 questions, each carrying 7 marks.
2. The duration of Semester End 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
UISCC012	Regular & Special Camp Activity	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
UISCC012	Regular & Special Camp Activity	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: Nil

Course Objectives

1. Develop among them a sense of social and civic responsibility.
2. Utilize their knowledge in finding practical solutions to individual and community problems.
3. 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
UISCC022	Fine Arts	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
UISCC022	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

1. 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)
2. 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

1. Performing Secondary Research on Indian Art forms
2. Performing Secondary Research on Traditional Painting Techniques of India
3. Assignment on Elements of Design
4. Assignment on Principles of Design
5. Assignment on Basics of Drawing
6. Assignment on Basics of Painting
7. 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

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
UISCC031	Physical Fitness	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
UISCC031	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-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
UISCC032	Yoga and Meditation	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
UISCC032	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

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**

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UHSVE001: Constitution of India

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
UHSVE001	Constitution of India	02	-		02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Semester End Exam (SEE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
UHSVE001	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: - Nil

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	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**
	2.1	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**
	3.1	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**
	4.1	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**
	5.1	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.

Semester End Examination

1. Question paper will be of 35 marks comprised of 5 questions, each carrying 7 marks.
2. The duration of Semester End 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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UHSVE002: Universal Human Values

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
UHSVE005	Universal Human Values	-	-		Audit Course	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Semester End Exam (SEE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
UHSVE005	Universal Human Values	-	-	25	-	40%	-	-	25

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: - Nil

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	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		**Self and Body in Harmony: Path to Health and Regulation**	**6**
	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**
	3.1	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**
	4.1	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**
	5.1	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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USTBS201: Calculus and Statistics

Course code	Course name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
USTBS201	Calculus and Statistics	03	-	01	03	-	01

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Practical/ Tutorial Marks		End Semester Exam (ESE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Term-work /Tutorial	Min. Pass	Marks	Min pass	
USTBS201	Calculus and Statistics	10	10	5	25	40%	25	40%	50	40%	100

Course Description:

This course provides a foundational understanding of key mathematical concepts essential for civil engineering. Topics include partial differentiation, first-order differential equations, statistics, probability distributions, curve fitting, and numerical methods. Students will learn about measures of central tendency, regression analysis, binomial and normal distributions, and Numerical Methods.

Pre-requisites: 11th and 12th standard Mathematics

Course Objectives:

- To introduce the concepts of partial differentiation and its applications.
- To develop an understanding of differential equations and their solutions.
- To learn statistical measures, probability distributions, and regression techniques to analyze and interpret data effectively.
- To use methods like least squares, correlation, and linear programming to fit a bivariate data.

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

- CO1 **Compute**[3] partial derivatives and apply them in real-world problems.
- CO2 **Formulate**[3] and solve first-order differential equations.
- CO3 **Compute**[3] measures of central tendency, correlation, and regression for data analysis.
- CO4 **Apply**[3] numerical methods to solve an algebraic and transcendental equation.

Course Contents

Module	Unit	Description	Hours
1.0		**Partial Differentiation**	
	1.1	Partial derivatives, Partial derivatives of higher order, Partial derivatives of composite functions, partial derivatives of Implicit functions.	**9**
	1.2	Euler's theorem on homogeneous function (Without Proof), Application to maxima and minima.	
2.0		**Differential equation of first order and first degree**	
	2.1	Definition, order and degree of differential equation, exact differential equations, Integrating factor, equation reducible to exact.	**9**
	2.2	Solution of differential equation of first order and first degree by linear equations, equation reducible to linear	
3.0		**Curve Fitting and lines of Regressions**	
	3.1	Introduction, Principle of Least Squares, Fitting a straight line y=a+bx, Fitting a parabola $y=ax^2+bx+c$, Fitting to a exponential curve.	
	3.2	Correlation, Karl Pearson Coefficient of Correlation, Coefficient of Correlation of Bivariate Frequency Distribution, Coefficient of Correlation by Rank differences, Regression, Linear Regression, Nonlinear regressions.	**9**
4.0		**Statistics**	
	4.1	Measures of central tendency, measures of dispersion, Random variable, Discrete probability distribution, continuous probability distribution, Probability density function.	**9**
	4.2	Binomial distribution, Poisson distribution, Normal distribution, Hypergeometric Distributions Mean and Variance of a Distribution	
5.0		**Solution of Algebraic and Transcendental Equations**	
	1.1	Introduction, Error and types of error, Numerical solution of algebraic and transcendental equation, Bracketing method: Roots of Equation by Bisection Method, False position method.	**9**
	1.2	Open method: Roots of Equation by Secant Method, Newton- Raphson method.	

Text Books

1 Bali N. P and Manish Goyal, A Textbook of Engineering Mathematics, Eighth Edition, Laxmi Publications Pvt Ltd., (2011)

2 Grewal. B. S "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi, (2011).

References

1 Erwin Kreyszing and Edward J. Normintonerwin, Advanced Engineering Mathematics, 10th edition, John Willey & Sons, Inc. Publication.

2 Dass, H.K., and Er. Rajnish Verma, Higher Engineering Mathematics, S. Chand Private Ltd., (2011).

3 Glyn James, Advanced Modern Engineering Mathematics, 3rd Edition, Pearson Education, (2012).

4 Peter V and O'Neil, Advanced Engineering Mathematics, 7th Edition, Cengage learning, (2012).

- **Internal Assessment (T1, T2, FET and Termwork):**

1. T1 should be based on first two modules and T2 should be based on next two modules, for 10 marks each.

2. Fifth module will be assessed for 5 marks separately.
3. Tutorial should be assessed based on accuracy, completeness, conceptual understanding, problem-solving approach, clarity of explanation, and presentation quality.
4. Term work assessment shall be based on the overall performance of the student with every tutorial graded from time to time.
5. The grades will be converted to marks as per 'credit and grading system' manual and should be added and averaged.

- **End Semester Examination:**

1. Question paper will comprise of 5 questions, each carrying 10 marks.
2. The duration of end semester examination shall be 2 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 beselected from all the modules.

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
USTBS204	Engineering Chemistry	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Semester End Exam (SEE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
USTBS204	Engineering 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: 11th and 12th standard Chemistry

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.

Module	Unit	Description	Hours
1.0		**Water**	**9**
	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**
	2.1	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**
	3.1	Nano materials: Graphene, CNT, nano wires, nano tubes, Nanoparticles Nano magnets, Generations of nanotechnology. Classification of nanomaterials:0D,1D,2D and 3D and types of nanomaterials (QDs, QW, CNT's, Bucky Balls, Nanocomposites etc). 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. Dyes and Pigment: Colour and chemical constitution, chromophore- auxochrome theory, valency bond theory, classification of dyes based upon structure & methods of application, synthesis and applications of malachite green, methyl orange, alizarine & phenolphthalein.	
4.0		**Metallurgy and Alloys**	**9**
	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**
	5.1	**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. Fossil fuel and Global carbon emission, Chemistry Behind Climate Change (Carbon cycle) and misconceptions, Real world Case Studies of Climate Change, Green House Gas Effect due to gases other than CO2, Examples of ways to handle the problems associated with CO2. Introduction, Biofuels, Hydrogen generation, Batteries and Solar cells	
	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..

Semester End Examination

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of Semester End 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
USTES201	Engineering Mechanics	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Semester End Exam (SEE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
USTES201	Engineering Mechanics	10	10	5	25	40%	50	40%	75

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**	**9**
	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**	**9**
	2.1	Moment, Couple, Equilibrium of 2D Rigid Bodies, Resultant of Non-Concurrent Force System	
	2.2	Applications and Problem Solving	
3.0		**Centroids and Moment of Inertia and Non-liner motion**	**9**
	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**	**9**
	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 Particles Relative 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**	**9**
	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. 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.

Semester End Examination:

1. Question paper will be of 50 marks comprise of 5 questions, each carrying 10 marks.
2. The duration of Semester End 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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UCVPC201: Elements of Civil Engineering

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
UCVPC201	Elements of Civil Engineering	02	-	-	02	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
UCVPC201	Elements of Civil Engineering		10	5	15	40%	35	40%	50

Course Description

This course helps students identify the fundamentals of Civil Engineering, to impart brief fundamental concept related to various components building, functions, building planning, bye plans, surveying etc

Pre-requisites: -

Course Objectives

- Recognize importance of civil engineering and its day-to-day applications
- Understand concept of planning and bye laws
- Compute various levels of surveying by different methods of leveling

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

- **CO1: Recognize**[2] importance of civil engineering and its day-to-day applications
- **CO2: Apply**[3] Principals of Planning and Bye Laws practically
- **CO3 Apply**[3] knowledge of surveying in linear and angular measurement
- **CO4: Corelate**[3] knowledge levelling in construction field

Course Contents

Module	Unit	Description	Hours
1.0		**Overview of Civil Engineering**	**6**
	1.1	Introduction to Civil Engineering – Various disciplines of Civil engineering, Importance of Civil engineering in infrastructure development, scopes for a career as a civil engineer	
	1.2	Introduction to types of buildings as per NBC, Selection of site for buildings	
2.0		**Components of Building**	**6**
	2.1	Components of a residential building and their functions. Types of loads. Load bearing structure and framed structure	
	2.2	General Requirement of Building, Elementary principles and basic requirements of a building planning. Introduction to building byelaws, BUA, FSI	
3.0		**Building Components and Structures**	**6**
	3.1	Foundations: Types of foundations – Bearing capacity, Masonry Works – classifications, definition of different technical terms, Brick masonry – types, bonds,	
	3.2	Types of bridges and dam, introduction to different modes of transportations types of roads, components of highway, Rain water harvesting	
4.0		**Surveying -Liner and Angular Measurement**	**6**
	4.1	Definition of Surveying, applications, Fundamental principles of surveying, Classification of surveying, Scales, Units of measurement. **Linear Measurement:** Methods, Instruments used in chain surveying, Selection of stations, Chaining, Ranging, Offsetting, Errors in chaining and correction,	
	4.2	Angular Measurement: Instruments used, Types of compass, Types of meridians and bearings, Measurement of bearings, Method of Bearing Or System (Whole Circle Bearings and Reduced Bearings), Fore bearing & Back bearing), computation of angles. Closed traverse and open traverse Compass traversing and correction of bearings for local attraction	
5.0		**Surveying -Levelling:**	**6**
	5.1	Aims and applications, definition of various terms, types of levelling instruments for levelling, methods of levelling, recording observations in level-book, computing reduced levels by HI and rise & fall method	
	5.2	Modern surveying instruments – EDM, Total station, GPS, remote sensing (Introduction only)	

Text Books

1. Arora S.P. and Bindra S.P., Basic Civil Engineering, Dhanpat Rai and Sons, New Delhi 1997.
2. Surveying Vol .I & II by Dr. B. C. Punamia Publication Laxmi Publication Delhi.
3 Building Construction, Author : Dr. B. C. Punamia, Publisher: Laxmi Pub. Delhi

References

1. Shanmugam, G, and Palanichamy, Building Construction, Planning Techniques and Method of Construction, Tata McGraw Hill Publishing Co., New Delhi, 1996
2 Elements of Civil Engineering Author: Dr. R.K. Jain and Dr. P.P. Lodha Publisher: McGraw Hill Education, India Pvt. Ltd.

Internal Assessment (T1, T2 and FET)

1. T2 should be based on syllabus, 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 07 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
USTVS204	Basic Construction Practices	03	-	-	03	-	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					End Semester Exam (ESE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Marks	Min pass	
USTVS204	Basic Construction Practices	10	10	5	25	40%	50	40%	75

Course Description

This course introduces students to the fundamental practices involved in building construction. It covers basic construction materials, tools, techniques, and standard site procedures followed in the construction industry.

Pre-requisites: - Elements of civil engineering

Course Objectives

- Familiarize students with the construction industry and its working environment.
- Introduce basic building materials and their applications in construction.
- Explain standard construction practices for foundations, masonry, and concrete works.

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

- **CO1: Describe**[2] properties and suitability of various building materials.
- **CO2: Demonstrate**[2] different bonds in brick and stone masonry and its suitability
- **CO3 Describe**[2] the different building components.
- **CO4: Design**[4] a staircase

Course Contents

Module	Unit	Description	Hours
1.0		**Basic Building Materials**	**09**
	1.1	Stones – Requirements of good building stone, uses of building stones. Bricks – Manufacturing, Types (clay bricks, fly ash, cellular light weight concrete brick, aerated cement concrete brick or autoclave brick) and Engineering Properties. Aggregates - Fine Aggregates and coarse aggregates – Introduction Timber – Natural and Artificial wood and their application in Civil Engineering. Steel – Standard structural sections, steel as reinforcement. High Yield Strength Steel and high tensile steel, uses of steel in Building Construction.	
	1.2	Cement- types. Tiles - Ceramic, Vitrified, Natural Stone, Paving Blocks etc.	
2.0		**Basic requirements of a building**	**09**
	2.1	Basic requirements of a building as a whole: strength and stability, Dimensional stability, comfort and convenience, damp prevention, water-proofing techniques, heat insulation, day lighting and ventilation. Sound insulation and anti-termite treatment.	
	2.2	Formwork: materials, types, and materials, types, and stripping time.	
3.0		**Masonry Construction Practices**	**09**
	3.1	Brickwork and Brick Bonds - English, Flemish, Rat trap bond (one brick thick). Composite masonry, various partition walls,	
	3.2	Stone masonry – Random Rubble, Uncoursed Rubble, Coursed Rubble and Ashlar Masonry.	
4.0		**Building Components**	**09**
	4.1	Arches: Arches and their stability consideration, technical terms in arches, types of arches. Lintel: Necessity, types Roofs and Roof coverings: Terms used. Roof and their selection, pitched roofs and their types, Steel Trusses types and their suitability,	
	4.2	Door and Window- Components, Types	
5.0		**Staircase**	**09**
	5.1	Stairs: Technical terms, requirements of a good stair, uses, types, materials for construction.	
	5.2	Design of stairs (Dog Legged, quarter turn and Open Well), Ramps, lifts and escalator	

Text Books

1. Arora S.P. and Bindra S.P., Basic Civil Engineering, Dhanpat Rai and Sons, New Delhi 1997.
2. A Text Book of Building Construction – S.P. Arora, S.P. Bindra (DhanpatRai Publications)
3. Building Construction, Author : Dr. B. C. Punamia, Publisher: Laxmi Pub. Delhi

References

1. Shanmugam, G, and Palanichamy, Building Construction, Planning Techniques and Method of Construction, Tata McGraw Hill Publishing Co., New Delhi, 1996
2. I.S. 962 – 1989 Code for Practice for Architectural and Building Drawings
3. A to Z of Practical Building Construction and Its Management- Sandeep Mantri(Satya Prakashan, New Delhi)

Internal Assessment (T1, T2 and FET)

1. 1. T2 should be based on syllabus, for 10 marks .
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
USTBS205	Engineering Chemistry Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term work	Min pass	Marks	Min pass	
USTBS205	Engineering Chemistry Lab	25	40%	-	-	25

Course Description-

This lab focuses on the practical chemical principles relevant to engineering materials and environments. Students will perform quantitative analyses to estimate vital water quality parameters and engage in the preparation and examination of basic engineering materials.

Pre-requisites -11th and 12th standard Chemistry.

Course Objectives

- To develop practical skills in quantitative chemical analysis, specifically for water treatment applications.
- To understand the practical properties and synthesis of materials used in the engineering industry.
- To promote safe laboratory practices, accurate data recording, and mechanism evaluation.

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 **Engineering Chemistry USTBS204**

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
USTES202	Engineering Mechanics Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
USTES202	Engineering Mechanics Lab	25	40%	-	-	25

Course Description- This lab reinforces the theoretical concepts of engineering mechanics through hands-on physical experiments. Students will practically verify principles of statics and dynamics, including force systems, equilibrium, moments of inertia, and kinetics**.**

Pre-requisites - Concurrent enrollment in Engineering Mechanics (USTES201) and foundational physics knowledge.

Course Objectives

- To experimentally verify the laws of concurrent and non-concurrent force systems.
- To understand the practical applications of work, energy, impulse, and momentum principles.
- To bridge the gap between theoretical mechanics calculations and physical structural reality.

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

- **CO1** Perform experiment related to the Resultant of Concurrent and Non-Concurrent Force System
- **CO2** Determine resultant of given force system to determine Moment of Inertia
- **CO3** Illustrate 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 – USTES201**

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. *****

UCVPC202: Elements of Civil Engineering Lab

Course Code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
UCVPC202	Elements of Civil Engineering Lab	-	02	-	-	01	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		End Semester Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
UCVPC202	Elements of Civil Engineering Lab	25	40%	-	-	25

Course Description- This foundational civil engineering laboratory introduces students to essential field surveying techniques and building component analysis. Students will gain practical, hands-on experience with linear measurements, compass surveying, and leveling instruments on the field.

Pre-requisites -High school geometry and trigonometry.

Course Objectives

- To impart practical skills in using basic surveying instruments such as chains, compasses, and levels.
- To train students in recording field observations accurately and executing closed traverses.
- To develop the ability to compute reduced levels and correlate leveling knowledge to active construction sites

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

- **CO1** Apply knowledge of linear measurements on field
- **CO2** Measurement of angular measurement by compass
- **CO3** Correlate knowledge of levelling on field

List of Experiments

1) Linear Measurement. Chaining, ranging. offsetting
2) Compass survey- bearing measurement,
3) Closed Traversing by compass
4) Introduction to types of levelling instruments
5) Calculation of RL by HI Method
6) Calculation of RL by Rise Fall Method
7) Report on different components of building

References

1. Surveying Vol. I and II, Author : S. K. Duggal, Publisher : Tata Macgraw hill Publication New Delhi
2. Surveying Vol .I & II by Dr. B. C. Punamia Publication Laxmi Publication Delhi.

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
UHSAE001	Professional Communication	01	02	-	01	01	-

Evaluation Scheme

Course Code	Course Name	Evaluation Scheme (In Semester)					Practical/ Tutorial Marks		Semester End Exam (SEE)		Total (Marks)
		T1	T2	FET	Total	Min pass	Term-work /Tutorial	Min. Pass	Marks	Min pass	
UHSAE001	Professional Communication	-	10	15	25	40%	25	40%	-	-	50

1 hour theory shall be taught to entire class followed by 2hrs, Practical in batches Course

Description

This course is designed to develop the English Communicative capacity required in social and professional life. The students will excel in professional communication that will help them in the academia and the world of practical affairs.

Pre-requisites: - Basic LSRW skills acquaintance.

Course Objectives

- To acquaint learners with the process of communication.
- To train learners to effectively apply LSRW skills in professional life.

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

- **CO1:** Identify importance of communication in formal situations.
- **CO2:** Analyze the process and forms of communication.
- **CO3:** Apply LSRW skills for effective communication in professional life.

Course Contents

Module	Unit	Description	Hours
1.0		**Communication Theory**	**3**
	1.1	Communication: Concept and Its Meaning, Process, Types: Verbal and Non-verbal Communication,	
	1.2	Use of Body Language in Communication and Grooming,	
	1.3	Levels and Networks of Communication: Formal and Informal,	
	1.4	Flows of Communication, Barriers to Communication, ways to overcome different barriers, and Technology in Communication.	
2.0		**Listening Skills**	**3**
	2.1	Importance of Listening, Listening and Hearing	
	2.2	Process of Listening, Barriers to Effective Listening	
	2.3	Types of Listening, Techniques of effective Listening	
3.0		**Speaking Skills**	**3**
	3.1	Public Speaking styles: ceremonial, persuasive, demonstrative and informative speaking.	
	3.2	Public Speaking Techniques, Elements of Public Speaking	
	3.3	Extempore and Prepared Speech, Group Discussion: GD Types, Skills, Do's Don'ts. Roles in GD, Debate	
4.0		**Reading Skills**	**3**
	4.1	Types of reading	
	4.2	Techniques for effective Reading	
	4.3	SQ3R Technique	
5.0		**Writing Skills**	**3**
	5.1	Seven C's of Communication	
	5.2	Business Letters, Types of Business Letters	
	5.3	Cover Letter & Résumé	

Text Books

1. Chadha, R.K., Communication Techniques and Skills, Dhanpat Rai Publications, New Delhi. 2014
2. Raymond Murphy, Essential English Grammar: A Self-Study Reference and Practice Book for 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 (Test 2) should be based modules, for 10 marks each.
2. FET shall be assessed for 15 marks separately.
3. Tutorial should be assessed based on accuracy, completeness, conceptual understanding, problem-solving approach, clarity of explanation, and presentation quality.
4. Term work assessment shall be based on the overall performance of the student with every tutorial graded from time to time.
5. The grades will be converted to marks as per ‘credit and grading system’ manual and should be added and averaged. *****

Course code	Course Name	Teaching Scheme (Hr/week)			Credits Assigned		
		Theory	Practical	Tutorial	Theory	Practical	Tutorial
UISCC012	Regular & Special Camp Activity	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
UISCC012	Regular & Special Camp Activity	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 and solve the major social and environmental issues/challenges and equip the classroom learning to face those challenges.
- **CO2:** Develop teacher competence, sensitivity and teacher motivation.
- **CO3:** Perform 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
UISCC022	Fine Arts	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
UISCC022	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 Traditional Indian Art
- **CO2:** Understand fundamentals of Visual Arts.
- **CO3:** Implement creative skills in Drawing & Painting
- **CO4:** Create 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

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
UISCC031	Physical Fitness	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
UISCC031	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 behavior.

Pre-requisites: Medically fit to undertake moderate to vigorous physical activity.

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
UISCC032	Yoga and Meditation	-	04	-	-	02	-

Evaluation Scheme

Course Code	Course Name	In Semester Evaluation		Semester End Exam (OE/POE)		Total (Marks)
		Term Work	Min pass	Marks	Min pass	
UISCC032	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: Medically fit to perform basic physical movements and postures; open to all fitness levels.

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**