Basaveshwar Engineering College, Bagalkote Department of Civil Engineering Scheme of Teaching and Examinations-2022 Outcome-Based Education (OBE)and Choice Based Credit System (CBCS)

(Effective from the academic year 2024-25)

| III | SEMESTE | R | | | , т | eaching | Hours/ | Week | | Exam | ination | | |
|-----------|---------|----------------|--|--|-------------------|--------------|---------------------------|------|--------------------|-----------|----------|----------------|---------|
| SI. No | Course | Course Code | Course Title | Teaching Department (TD) and Question aper Setting Board(PSB) | Theory Lecture | Tutorial | Practica 1/ Drawing | SDA | uration a hours | CIE Marks | EE Marks | Total Marks | Credits |
| | | | | <u> </u> | L | Т | Р | S | D ii | | S | | |
| 1 | PCC | 22UCV310C | Strength of Materials | TD:CVPSB:CV | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 2 | IPCC | 22UCV311C | Engineering Survey | TD:CVPSB:CV | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 3 | IPCC | 22UCV312C | Engineering Geology | TD-Geology/CV PSB-Geology/CV | 3 | 0 | 2 | | 03 | 50 | 50 | 100 | 4 |
| 4 | PCC | 22UCV313C | Water Supply and Wastewater Engineering | TD:CVPSB:CV | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 5 | PCCL | 22UCV314L | Computer Aided Building Planning and Drawing | TD:CVPSB:CV | 0 | 0 | 2 | | 03 | 50 | 50 | 100 | 1 |
| 6 | ESC | 22UCV315C | Sustainable Design concept for Building Service | PSB:CV | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 7 | UHV | 22UHS317L | Social Connect and Responsibility | Any Department | 0 | 0 | 2 | | 01 | 100 | | 100 | 1 |
| • | | | | | If the | course is | a Theory | r | 01 | | | | |
| 8 | AEC/ | 22UCV316C | Personality Development for Civil | | 1 | 0 | 0 | | 01 | 50 | 50 | 100 | 1 |
| | SEC | | Engineers | | If a co | ourse is a l | aborator | y | 02 | | | | |
| | | 22UHS002M | National Service Scheme (NSS) | NSS coordinator | 0 | 0 | <u> </u> | | | | | | + |
| Q | | 22UHS003M | Physical Education (PE) | Physical Director | 0 | 0 | 2 | | | 100 | | 100 | 0 |
| , | MC | 22UHS001M | Yoga | Yoga Teacher | - | | | | | | | | |
| | | 22UHS004M | Music | Music Teacher | 1 | | | | | | | | |
| | 1 | 1 | 1 | 1 | | | 1 | 11 | Total | 550 | 350 | 900 | 20 |

PCC: Professional Core Course, **PCCL**: Professional Core Course laboratory, **UHV**: Universal Human Value Course, **MC**: Mandatory Course (Non-credit), **AEC**: Ability Enhancement Course, **SEC**: Skill Enhancement Course, **L**: Lecture, **T**: Tutorial, **P**: Practical **S**= **SDA**: Skill Development Activity, **CIE**: Continuous Internal Evaluation, **SEE**: Semester End Evaluation K: This letter in the course code indicates common to all the stream of Engineering. ESC: Engineering Science Course, ETC: Emerging Technology Course, PLC: Programming Language Course

| Engineering Science Course (ESC/ETC/PLC) | | | | | |
|--|----------------|--|--|--|--|
| Rural, Urban Planning and Architecture | 22UCV315C | Sustainable Design Concept for Building Services | | | |
| Geospatial Techniques in Practice | | Fire Safety in Buildings | | | |
| Ability Enhanceme | nt Course –III | | | | |
| Data analytics with Excel (0:0:1) | | Problem Solving with PYTHON | | | |
| Smart Urban Infrastructure | 22UCV316C | Personality Development for Civil Engineers | | | |

Professional Core Course (IPCC): Refers to Professional Core Course Theory Integrated with practicals of the same course. Credit for IPCC can be 04 and its Teaching–Learning hours (L : T : P) can be considered as(3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper. For more details, the regulation governing the Degree of Bachelor of Engineering/Technology (B.E./B.Tech.)2022-23may please be referred.

National Service Scheme /Physical Education/Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first Week of III semesters. Activities shall be carried out between III semesters to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the Degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE , and Yoga activities. These courses shall Not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of Degree.

| Course Code:22UCV310C | | Credits: 03 |
|---|-----------------------|-------------------|
| Hours/Week (L:T:P) : 3-0-0 | Strength of Materials | CIE Marks : 50 |
| Total Hours of Pedagogy (Theory): 40 | | SEE Marks : 50 |
| Course Type: Theory | | |

Course Objectives:

- Understand the simple stresses, strains, and compound stresses in various structural components.
- Understand the behaviour and strength of structural elements subjected to compound stresses and stresses in thin and thick cylinders
- Understand the bending moments and shear forces in different types of beams under various loading conditions
- Know the bending stress, shear stress, and torsional stress in beams and shafts with different cross sections
- Understand the deflection in beams and the stability of columns under different loading conditions.

Module - 1

Simple Stresses and Strains: Introduction, Properties of Materials, Stress, Strain, Hooke's law, Poisson's Ratio, Stress – Strain Diagram for structural steel, Principles of superposition, Total elongation of tapering bars of circular and rectangular cross sections. Composite section, Volumetric strain, expression for volumetric strain, Elastic constants, relationship among elastic constants. Thermal stresses and strains, Compound bars subjected to thermal stresses, state of simple shear.

Module - 2

Compound Stresses: Introduction, state of stress at a point, General two-dimensional stress system, Principal stresses and principal planes. Mohr's circle of stresses.

Thin and Thick Cylinders: Introduction, Thin cylinders subjected to internal pressure; Hoop stresses, Longitudinal stress and change in volume. Thick cylinders subjected to both internal and external pressure; Lame's equation, radial and hoop stress distribution.

Module - 3

8 Hrs.

Bending moment and shear force diagrams in beams: Introduction to types of beams, supports and loadings. Definition of shear force and bending moment, sign convention, Relationship between loading, shear force and bending moment, Shear force and bending moment equations, development of Shear Force Diagram(SFD) and Bending Moment Diagram (BMD) with salient values for cantilever, simply supported and overhanging beams for point loads, UDL (Uniformly Distributed Load), UVL (Uniformly Varying Load), Couple and their combinations

8 Hrs.

8 Hrs.

Module - 4

Bending and Shear Stresses in Beams: Introduction, pure bending theory, Assumptions, derivation of bending equation, modulus of rupture, section modulus, flexural rigidity. Expression for transverse shear stress in beams, Bending and shear stress distribution diagrams for circular, rectangular, 'I', and 'T' sections.

Torsion in Circular Shaft: Introduction, pure torsion, Assumptions, derivation of torsion equation for circular shafts, torsional rigidity and polar modulus Power transmitted by a shaft.

Module - 5

8 Hrs.

Deflection of Beams: Definition of slope, Deflection and curvature, Sign conventions, Derivation of moment- curvature equation. Double integration method and Macaulay's method: Slope and deflection for standard loading cases and for determinate prismatic beams subjected to point loads, UDL, UVL and couple.

Columns and Struts: Introduction, short and long columns. Euler's theory; Assumptions, Derivation for Euler's Buckling load for different end conditions, Limitations of Euler's theory. Rankine-Gordon's formula for columns.

Suggested Learning resources

Text Books

• B.C Punmia Ashok Jain, Arun Jain, "Strength of Materials", Laxmi - 2018-22 Publications, 10th Edition-2018

• R K Bansal, "A Textbook of Strength of Materials", 4th Edition, Laxmi Publications, 2010

• S.S. Rattan "Strength of Materials" McGraw Hill Education (India) Pvt. Ltd., 2nd Edition (Sixth reprint 2013).

• Vazirani, V N, Ratwani M M. and S K Duggal "Analysis of Structures Vol. I", 17th Edition, Khanna Publishers, New Delhi.

- R.K. Rajput, "Strength of materials" S. Chand Publishing (6th Edition)
- S SBhavikatti, "Strength of Materials" Vikas Publishing (5th Edition)
- B.S. Basavarajaiah, P. Mahadevappa "Strength of Materials" in SI Units, University Press (India) Pvt. Ltd., 3rd Edition,2010

Reference Books:

1. Beer F.P. and Johnston E. R., Mechanics for Engineers, Statics and Dynamics, 1987, McGraw Hill.

2. Irving H. Shames, Engineering Mechanics, 2019, Prentice - Hall.

3. Hibbler R. C., Engineering Mechanics: Principles of Statics and Dynamics, 2017, Pearson Press.

4. Timoshenko S, Young D. H., Rao J. V., Engineering Mechanics, 5th Edition, 2017, Pearson Press.

Course Outcomes:

CO1: Evaluate the simple stresses, strains and compound stresses

CO2:Evaluate the behaviour and strength of structural elements under the action of compound stresses and stresses in thin and thick cylinders.

CO3: Calculate the Bending moments, shear force and draw BMD, SFD for various types of beams and loadings

CO4: Analyse the bending stress, shear stress and torsional stress in beams and shafts with different cross sections

CO5: Evaluate the deflection in beams and determine the stability of the columns.

| | Programme Outcome; | | | | | | | | | | | | |
|-----------------|--------------------|---|---|---|---|---|---|---|---|----|----|----|--|
| Course Outcomes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| CO1 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | |
| CO2 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | |
| CO3 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | |
| CO4 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | |
| CO5 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | |
| Average | 3 | 3 | 2 | 2 | | | | | | | | 2 | |

CO and PO Mapping

| Engineeri | ng Survey | Semester | 3 | | | | |
|---|---|---------------------------------|-------------------------------|--|--|--|--|
| Course Code | 22UCV311C (IPCC) | CIE Marks | 50 | | | | |
| Teaching hours/ Week | 3.0.2.0 | SEE Morka | 50 | | | | |
| (L:T:P) | 5:0:2:0 | SEE WAIKS | 50 | | | | |
| Total Hours of | 40 Hrs Theory + 10 Lab | Cradita | Λ | | | | |
| Pedagogy | slots | Creans | 4 | | | | |
| | MC | DULE -1 | 8 Hrs | | | | |
| Engineering Survey: De | finition of surveying, Objec | tives and importance of sur | veying for civil engineers. | | | | |
| Surveying Types- Contr | ol Survey, Topographical | Survey, Construction Survey, | urvey, Cadastral Survey, | | | | |
| Hydrographic survey and u | nderground survey. Surveyin | g through the ages – Chain S | urveying. | | | | |
| Measurement of Distance | Types of tapes, Laser distar | nce meter, Distance measurin | g wheel, EDM, GPS. | | | | |
| Measurement of Direction | ns and Angles: Compass su | urvey: Basic definitions, me | ridians, bearings, magnetic | | | | |
| and True bearings. Prismati | c and surveyor's compasses, | temporary adjustments, decl | ination. Quadrantal bearing | | | | |
| system, whole circle bearin | g system, local attraction. | | | | | | |
| | MC | DDULE -2 | 8 Hrs | | | | |
| Levelling /Vertical Contro | ol- Concepts of various types | of Datum – Mean Sea level, | Bench marks – Temporary | | | | |
| and Permanent. Levelling- | Terms used in levelling, Set | ting up of Dumpy level. Dif | ferential levelling by plane | | | | |
| of collimation method using | g Dumpy level. Longitudinal | and cross sectioning – Defin | nition, importance of L/S & | | | | |
| C/S. Numerical Problems | | | | | | | |
| Contours - Definition, term | ns used, characteristics of co | ntours and applications of co | ontours in civil engineering | | | | |
| practice. Contouring using | level, theodolite and total sta | tion. Plotting of contours in G | CAD. | | | | |
| | MC | DDULE -3 | 8 Hrs | | | | |
| Theodolite Surveying - | Terms used in Theodolite | surveying. setting up a th | eodolite. Measurement of | | | | |
| horizontal and vertical angl | es with Theodolite. | | | | | | |
| Trigonometric Levelling: | Determination of Heights an | d Distances: of an accessible | e object, Inaccessible object | | | | |
| by single plane and double | plane methods, Numerical pr | oblems. | | | | | |
| | MC | DULE -4 | 8 Hrs | | | | |
| Curves: Simple curves: Ty | pes, Elements, Designation of | of curves, Setting out of simp | le curves by linear methods | | | | |
| (numerical problems on c | offsets from long chord & | chord produced method), a | and Setting out curves by | | | | |
| Rankine's deflection angle | method, Numerical problems | 8. | | | | | |
| Areas and Volumes- Me | Areas and Volumes- Methods of determining areas by trapezoidal and Simpsons' rule. Measurement of | | | | | | |
| volume by prismoidal and trapezoidal formula. Earthwork volume calculations from spot levels and from | | | | | | | |
| ontour maps; Earthwork calculation in Embankments. | | | | | | | |

MODULE -5

Total Station Surveying – Features, parts, accessories and advantages of Total Station. Surveying with total station – Measurement of Horizontal angle, vertical angle, distance, slope, vertical distance, multiple angles with Total station. Using Total station for Area measurement and Volume calculation.

Surveying with Drone – Introduction, applications and advantages. Features of photogrammetric mapping method. Drone surveying requirements- Drone platform, Flight planning software, Sensor DGPS equipment and Image processing software. Types of drones and sensors. Process of drone surveying – flight planning, DGPS markers, capturing images, post processing of images using photogrammetry software and output maps. Application and uses of Remote sensing and GIS in engineering surveying.

SL **Experiments** NO Demonstration of Equipment's used for chain surveying, tapes, Laser distance meter, Distance 1 measuring wheel. 2 Compass Surveying, Setting out hexagon by compass 3 Differential levelling by Dumpy level 4 Fly levelling and Fly back levelling 5 (Profile) Longitudinal sectioning and cross sectioning using Dumpy level /Total station 6 Contouring and plotting with Dumpy level/ Total station 7 Measurement of horizontal and vertical angles by Theodolite. Method of repetition 8 Determination of Heights when Base is accessible and Inaccessible 9 Setting up of Total station. Features and components of Total station 10 Measurement of Distance, slope, vertical distance, horizontal and vertical angles using Total station 11 Coordinate measurement with Total station Visit to Railway station / Large construction site to understand the importance of datum and bench 12 mark.

PRACTICAL COMPONENTS OF IPCC

Assessment Details (both CIE and SEE)

| Theory CIE 50 marks + Practical CIE 50 marks (30+20) | 100 marks reduces to 50 |
|--|-------------------------|
| Semester End Examination | 100 marks reduces to 50 |
| Total | 100 marks |

At the end of the course, the student will be able to:

- Summarize various types of surveying and carry out distance measurement using various equipment's
- Illustrate the use and applications of levelling and theodolite
- Plot contours, longitudinal and cross sections for construction projects.
- Set curves for construction works and carry out estimation of areas and volumes.
- Demonstrate the necessary skills to carry out GPS and DRONE Surveying

| Course Outcomes | Programme Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | | | |
|-----------------|--------------------------|---|---|---|---|---|---|---|---|----|----|----|-------------------------------------|---|---|--|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | | |
| C01 | 2 | 2 | 1 | - | - | - | - | - | 3 | 2 | - | 2 | | | | | |
| CO2 | 2 | 2 | - | - | - | - | - | - | 3 | 2 | - | 2 | | | | | |
| CO3 | 3 | 2 | 1 | - | - | - | - | - | 3 | 2 | - | 2 | | | | | |
| CO4 | 3 | 2 | 1 | - | - | - | - | - | 3 | 2 | - | 2 | | | | | |
| CO5 | 3 | 2 | 1 | - | 2 | - | - | - | 3 | 2 | - | 2 | | | | | |

| Course Code:22UCV312C | | Credits: | 3+1=4 |
|--|---|--|--|
| Hours/Week (L:T:P): 3:0:2 | | CIE Marks : | 50 |
| Total Hours of Pedagogy | ENGINEERING GEOLOGY | SEE Marks : | 50 |
| (Theory+Lab):40+10 = 50 | | | |
| Course Type: Theory/Practical/Integrate | ed : INTEGRATED | | |
| Course Objectives: | | | |
| To realize the importance of earth a engineering problems. | science, earth's internal structure an | d dynamics to s | olve the ci |
| To acquire the knowledgeondurabili different civil engineering projects. | ityandcompetenceof earth's materials | and their prop | per usage f |
| To understand the significance of wea | thering and soil in the field of civil engi | neering. | |
| To recognize the geological structures civil engineering projects. | and overcome their impacts in selectic | on of safe stable s | ites for ma |
| To solve various issues related to grour sensing, GIS and GPS as a latest tool ir | ndwater and intelligent enough to apply n different civil engineering projects. | / geophysical met | thods, remo |
| | Module - 1 | | 8 Hrs. |
| ntroduction : Geology, its branches, the and composition, internal dynamics and I types, causes, iso-seismic lines, seismic andslides-causes types, preventive meas and management. | e scope of earth science in civil engine Plate tectonics, Earthquakes zonation, seismic proof structures. Volo sures; Tsunami – causes, consequences | ering.Earth'sinte canic eruption -ty , mitigation. Cycl | rnal structu vpes, causes ones-cause |
| | Module - 2 | | 8 Hrs. |
| Earth Material sin Construction: Minerals –Study of physical properties, minerals. Rocks- Rock cycle, mode o engineering usage of important igneou stones, decorative stones and railway b | chemical composition and use of Ind of occurrence, structures, textures, cl us, sedimentary and metamorphic rock vallast. | ustrial, rock-form assification, desc s. Qualities of go | ning and or cription an ood buildin |
| | Madula 2 | | 8 Hrs |
| | iviodule - 5 | | 01113. |

Module - 4

8 Hrs.

Surface and sub surface investigation for deep foundation:

Basic terms in structural geology – Outcrop, inlier, outlier, dip and strike. Deformational structures -Faults, folds, unconformity, joints - types, recognition and their significance in Civil engineering projects like tunnel project, dam project, Reservoir site. Dip and strike problems, outcrop (thickness) problems (numerical problem geometrical/simple trigonometrybased) and borehole (data) problems.

Module - 5

ModernToolsandgeophysicalmethods:

Hydrological cycle, mode of occurrence and sources of groundwater, Rocks as aquifers, water-bearing properties igneous, sedimentary and metamorphic rocks, coefficient of permeability, factors affecting

permeability, Electrical Resistivity meter, depth ofwatertable, (numericalproblems). Application of remote sensing, GIS and GPS in civil engineering.

Practical Module

| SI.No | Experiments 10 Hrs | |
|-------|--|--|
| 1 | Identification of common minerals based on Physical Properties | |
| 2 | Identification of rocks used in building construction based on Physical properties | |
| 3 | Solving Geological maps for suitability for aquaduct | |
| 4 | Geological maps with inclined beds, suitability for tunnels/Dams | |
| 5 | Geological maps with folds, in tunnels / Dams | |
| 6 | Geological maps with unconformity, in tunnel / dam project | |
| 7 | Geological maps with faults in Dams / tunnels project | |
| 8 | One Day Nearest Field Visit Investigation. | |
| | | |

Suggested Learning resources

Books

- 1. Engineering Geology, by Parthasarathy etal, Wiley publications.
- 2. A text book of Engineering Geology by ChennaKesavulu, MacMillan India Ltd.
- 3. Principle of Engineering Geology, by K. M. Bangar, Standard publishers.
- 4. Physical and Engineering Geology, by S. K. Garg, Khanna publishers.
- 5. Principles of Engineering Geology, by K. V. G. K. Gokhale, B. S. Publications.
- 6.Introduction to Environmental Geology by Edward. A. Keller, Pears on publications.
- 7. Engineering Geology and Rock Mechanics B. P. Verma, Khanna publishers.
- 8. Principles of Engineering Geology and Geotechnics, Krynine and Judd, C. B. S. Publications.
- 9. Engineering geology, by Vasudev. Kanithi, MacMillan Publishers India Ltd.
- 10. Engineeing Geology, by D. Venkat Reddy, Vikas Publishing House Pvt. Ltd .
- 11. Engineering and General Geology, by Parbin Singh, S K Kataria and Sons.
- 12. Engineering Geology, by SubinoyGangopadhay, Oxford University Press.

Course Outcomes:

| After | the | completio | n of this | course | students | will be able to |
|-------|-----|-----------|-----------|--------|----------|-----------------|
|-------|-----|-----------|-----------|--------|----------|-----------------|

| CO1: | Realise the importance of earth science, earth's internal structure and dynamics to Solve the civil engineering problems. |
|------|---|
| CO2: | Acquire the knowledgeondurabilityandcompetenceof earth's materials and their proper usage for different civil engineering projects. |
| CO3: | Understand the significance of weathering and soil in the field of civil engineering. |
| CO4: | Recognise the geological structures and overcome theirimpacts in selection of safe stable sites for major civil engineering projects. |

| Course Outcomes | Programme Outcomes | | | | | | | | | | | | | |
|-----------------|--------------------|---|---|---|---|---|---|---|---|----|----|----|--|--|
| Course Outcomes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| C01 | 1 | | | | | 3 | | | | 1 | | 2 | | |
| CO2 | 1 | 1 | | | | 2 | | | | 2 | | 2 | | |
| CO3 | | | 2 | | | | | | | | | 2 | | |
| CO4 | 1 | | | | | 3 | | | | | | 2 | | |
| CO5 | 2 | | | | 3 | | | | | | | 2 | | |

| 22UCV313C | | Credits | : 03 | | | | | | | | | |
|--|---|---|--------------------------------|--|--|--|--|--|--|--|--|--|
| L:T:P - 3 : 0: 0 | WATER SUPPLY AND WASTEWATER ENGINEERING | CIE Marks | : 50 | | | | | | | | | |
| Total Hours/Week: 3 | | SEE Marks | 5: 50 | | | | | | | | | |
| | | | | | | | | | | | | |
| | Module - I | | 08 Hrs. | | | | | | | | | |
| domestic demand, industrial, institutional and commercial demand, public use and fire demand estimation, factors affecting per capita demand, Variations in demand of water. Design period and factors governing design period. Methods of population forecasting and Numerical problems. Water sampling methods. | | | | | | | | | | | | |
| | Module – II | | 08 Hrs. | | | | | | | | | |
| water ireatment: Objectives, Unit flow diagrams – Significance of each unit, Aeration process Limitations and types. Sedimentation - Theory, settling tanks, types and design with numerical, Coagulation and flocculation, types of coagulants. Filtration: Mechanism, theory of filtration, types of filters: slow sand, rapid sand and pressure filters. Operation and cleaning. Design of slow and rapid sand filter without under drainage system, Numerical. | | | | | | | | | | | | |
| Module – III 08 Hrs. | | | | | | | | | | | | |
| Wastewater: Introduction: N Treatment of municipal wa physical, chemical and biolog | ع. Need for sanitation, methods of sewage disposal, t stewater: Wastewater characteristics sampling, si ical characteristics, Numerical on BOD. | ypes of sewera gnificance and | ge systems. techniques, | | | | | | | | | |
| | Module – IV | | 08 Hrs. | | | | | | | | | |
| Treatment Process: flow diag types, disposal. Grit chambe growth system - conventional | ram for municipal wastewater treatment unit operati r, oil and grease removal. Primary and secondary so activated sludge process and its modifications, num | ons and process ettling tanks, Su erical. | Screens: uspended | | | | | | | | | |
| | Module – V | | 08 Hrs. | | | | | | | | | |
| Attached growth system – Tr of stabilization ponds, oxidat drying beds. | ickling filter, numerical on Trickling filters, rotating bio ion ditch. Sludge digesters (aerobic and anaerobic), I | ological contacto Equalization. Th | ors. Principle ickeners and | | | | | | | | | |

Reference Books *

- 1. Howard S. Peavy, Donald R. Rowe, George T, "Environmental Engineering" Tata McGra Hill, New York, Indian Edition, 2013
- S. K. Garg, Environmental Engineering Volume-I, Water supply Engineering M/s Khanna Publishers, New Delhi 2010
- 3. B.C. Punmia and Ashok Jain, Environmental Engineering I-Water Supply Engineering, Laxmi Publications (P) Ltd., New Delhi 2010.
- 4. B C Punmia, "Environmental Engineering volume-II", Laxmi Publications 2nd, 2016
- 5. Karia G.L., and Christian R.A, "Wastewater Treatment Concepts and Design Approach", Prentice Hall of India Pvt. Ltd., New Delhi. 3rd, Edition, 2017.
- 6. S.K. Garg, "Environmental Engineering vol-II, Water supply Engineering", Khanna Publishers, New Delhi, 28th edition and 2017.
- 7. CPHEEO Manual on water supply and treatment engineering, Ministry of Urban Development, Government of India, New Delhi.
- 8. Mark.J Hammer, Water & Wastewater Technology, John Wiley & Sons Inc., New York, 2008

Course Outcomes**

After completion of the course student will be able to

- 1. Analyze the variation of water demand and to estimate water requirement for a community.
- 2. Study drinking water quality standards and to illustrate qualitative analysis of water.
- 3. Analysis of physical and chemical characteristics of water and wastewater.
- 4. Understand and design of different unit operations and unit process involved in water and wastewater treatment process.
- 5. Design of various AOPs and low-cost treatment units.
 - * Books to be listed as per the format with decreasing level of coverage of syllabus
 - ** Each CO to be written with proper action word and should be assessable and quantifiable

| Course Outcomes | Programme Outcomes (POs) | | | | | | | | | | | Program Specific Outcomes (PSOs) | | | |
|-----------------|----------------------------|---|---|--|--|---|--|---|---|---|--|-------------------------------------|---|---|---|
| | 1 2 3 4 5 6 7 8 9 10 11 12 | | | | | | | 1 | 2 | 3 | | | | | |
| CO1 | 3 | 3 | 3 | | | 2 | | 2 | | | | 3 | 2 | 3 | 3 |
| CO2 | 3 | 3 | 3 | | | 2 | | 2 | | | | 3 | 3 | 2 | 3 |
| CO3 | 3 | 3 | 3 | | | 2 | | 2 | | | | 3 | 2 | 2 | 2 |
| CO4 | 3 | 3 | 3 | | | 2 | | 2 | | | | 3 | 2 | 2 | 2 |
| CO5 | 3 | 3 | 3 | | | 3 | | 3 | | | | 2 | 1 | 2 | 2 |

| COMPUTER AI PLANNING AI | DED BUILDING ND DRAWING | Semester | 3 |
|----------------------------------|----------------------------|-------------|-----|
| Course Code | 22UCV314L | CIE Marks | 50 |
| Teaching hours/ Week (L:T:P) | 0:0:2:0 | SEE Marks | 50 |
| Credits | 1 | Total Marks | 100 |

PRACTICAL COMPONENTS OF IPCC

| SL NO | Experiments | | | | | | | | | |
|----------|---|--|--|--|--|--|--|--|--|--|
| 1 | Drawing Basics: Selection of scales for various drawings, thickness of lines, dimensioning, | | | | | | | | | |
| | abbreviations and conventional representations as per IS:962 | | | | | | | | | |
| | Drawing Tools: Lines Circle, Arc, Poly line, Multiline, Polygon, Rectangle, Spline, Ellipse, Modify | | | | | | | | | |
| 2 | tools: Erase, Copy, Mirror, Offset, Array, Move, Rotate, Scale, Stretch, Lengthen, Trim, Extend, Break, | | | | | | | | | |
| | Chamfer and Fillet, | | | | | | | | | |
| 3 | Using Text: Single line text, Multiline text, Spelling, Edit text | | | | | | | | | |
| 4 | Special Features: View tools, Layers concept, Dimension tools, Hatching, Customizing Toolbars, | | | | | | | | | |
| 4 | Working with multiple drawings | | | | | | | | | |
| | Drawings of Different Building Elements: Refer NBC before practice | | | | | | | | | |
| | a> Footing– Foundation dimension for Isolated Stepped wall footing | | | | | | | | | |
| 5 | b> Cross section of masonry wall for one storey and two storey building | | | | | | | | | |
| | c> Brick Masonry - Size of standard Burnt Brick, Solid Cement Block, Hollow Cement block, | | | | | | | | | |
| | Other bricks used in current practice | | | | | | | | | |
| | Principles of planning, Planning regulations and building bye-laws, factors affecting site selection, | | | | | | | | | |
| 6 | Functional planning of residential and public buildings, design aspects for different public buildings. | | | | | | | | | |
| | Recommendations of NBC. | | | | | | | | | |
| 7 | Prepare the centre line drawing for marking the single and double bedroom house | | | | | | | | | |
| 8 | Draw a building plan, cross section and elevation for single and double bed room accommodation for a | | | | | | | | | |
| 0 | given site dimension. Students have to go through Building Bye Laws and regulations | | | | | | | | | |
| 9 | Prepare single line diagram for the Primary Health Centre, Primary School Building & PWD EE Office. | | | | | | | | | |
| 10 | Drawing of plan with electrical, plumbing and sanitary services using CAD software | | | | | | | | | |
| 11 | Drawing standard sections for Lintel and chajja, Columns. | | | | | | | | | |
| 12 | Drawing different types of staircases – Dog legged, Open well – plan and section | | | | | | | | | |

Course Outcomes

- 1. Select appropriate scales, line thickness, dimensioning, and conventional representations as per IS:962.
- 2. Utilize CAD tools to create building plans, sections, and elevations with electrical, plumbing, and sanitary services.
- 3. Understand site selection, building bye-laws, and NBC recommendations for residential and public buildings.
- 4. Prepare centerline drawings, staircases, and various building elements with accurate specifications.

| Cos/POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---------|------|------|-----|------|------|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 3 | 1 | 2 | - | - | - | - | - | - | 1 |
| CO2 | 3 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | 1 |
| CO3 | 2 | 2 | 3 | 2 | 1 | - | - | - | - | - | - | 1 |
| CO4 | 3 | 3 | 3 | 2 | 3 | - | - | - | - | - | - | 1 |
| Average | 2.75 | 2.25 | 3 | 1.75 | 2.25 | - | - | - | - | - | - | 1 |

| SUSTAINABLE DESIGN C | Semester | 3 | |
|---------------------------------|-----------|-------------|-----|
| Course Code | 22UCV315C | CIE Marks | 50 |
| Teaching Hours/Week (L: T:P: S) | 3:0:0:0 | SEE Marks | 50 |
| Total Hours of Pedagogy | 40 | Total Marks | 100 |
| Credits | 03 | Exam Hours | 3 |
| Examination type (SEE) | Theory | | |

Course objectives:

- To facilitate learners to understand sustainable building designs and its parameters such as energy and water efficiency, Comfort in buildings, and waste management.
- To expose the learners to shading systems, thermal and visual comfort.
- To impart fundamental knowledge on Life cycle assessment and Green ratings and certifications.

Teaching-Learning Process (General Instructions)

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

- 1. Videos to teach, providing activities and assignments.
- 2. Power Point presentation during online expert sessions.
- 3. Hands-on software exercises through virtual classrooms.

Module-1

Introduction to Sustainability and Climatology: Overview of Sustainability – Global energy scenario, carbon footprint and climate action, Net zero in carbon offsetting, Water neutral, Sustainable construction and resource management. Green buildings - Selection of site – preservation and planning, Influence of climate on buildings, Basics of climatology, Earth – Sun relationship, Solar angles and sun path diagram, Design of shading systems.

Module-2

Comfort in Buildings: Thermal comfort – Basics of Thermodynamics, Convection/radiation heat transfer, Heat gain through various elements of a building, Thermal comfort models and case studies Acoustics – Building acoustics, measures, defects and prevention of sound transmission Indoor Air Quality – Effects, design consideration and integrated approach for IAQ management Visual comfort – Enhancement strategies for Daylighting and Artificial

Module-3

Energy, water efficiency and waste management in buildings: Energy efficiency – Energy efficiency in building envelope and energy efficient HVAC and Lighting as per Energy conservation building code (ECBC) 2017, Energy simulation-Case studies Energy management system – Renewable energy and Energy Audit. Water Efficiency – Planning and design of water management system, Rain water harvesting, Water efficient design and fixtures, Treatment and reuse and Water efficient landscape system.

Waste management – Types of waste and its treatment methods, Construction and demolition waste management, Waste management in residential, commercial buildings, healthcare facilities.

Module-4

Life Cycle Assessment of Buildings and Green project management: Materials – Green product certifications, features of sustainable building materials and sustainable alternatives for structural, envelope and finishing materials. Low carbon cement, Zero emission bricks and lean construction practices. Life cycle assessment and its types – Modelling and Analysis, Greenhouse gas emission. Different phases of Green building project management.

Module-5

Sustainable rating systems: Green building rating systems- LEED, BREEAM and others, Indian Green building rating systems – IGBC & GRIHA. IGBC criteria for certification -site selection credits, pre-design credits, detailed design credits, pre-construction credits, construction credits.

Suggested Learning Resources:

Books

- 1. HarharaIyer G, Green Building Fundamentals, Notion Press
- 2. Dr. Adv. HarshulSavla, Green Building: Principles & Practices
- 3. IGBC Green new building rating system version 3.0 Abridged reference guide
- 4. The Sustainable Habitat Handbook (6 Volume Set), GRIHA Version 2019
- 5. National Building Code 2016, Volume 1&2, Bureau of Indian Standards

Energy Conservation Building Code – 2017 (with amendments up to 2020), Bureau of Energy Efficiency

Web links and Video Lectures (e-Resources):

• E-learning content on L&T EduTech Platform.

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- ECO NIWAS by Ministry of Power, Free Web tool to practice energy conservation
- Roof top solar energy calculator, Free Web tool to calculate solar power available

Course Outcomes:

Course outcome (Course Skill Set)

At the end of the course, the student will be able to :

- 1. Comprehend sustainable design, climatology, shading system and analyze heat transfer mechanism in buildings.
- 2. Assess the design considerations and parameters for thermal comfort, visual comfort, indoor air quality and acoustics.
- 3. Develop solutions for energy efficiency, water efficiency and waste management in buildings.
- 4. Adopt green project management methodology and evaluate building life cycle assessment.
- 5. Implement green practices during construction and operation phase of the buildings for achieving green rating.

| Course Outcomes | Programme Outcomes | | | | | | | | | | | | | |
|-----------------|--------------------|---|---|---|---|---|---|---|---|----|----|----|--|--|
| Course Outcomes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| CO1 | 2 | - | - | - | - | - | 3 | - | - | - | - | 3 | | |
| CO2 | 2 | 2 | - | - | - | - | 3 | - | - | - | - | 3 | | |
| CO3 | 2 | 2 | - | - | - | - | 3 | - | - | - | - | 3 | | |
| CO4 | 2 | 2 | - | - | - | - | 3 | - | - | - | - | 3 | | |
| CO5 | 2 | 3 | - | - | - | - | 3 | - | I | - | - | 3 | | |

Course Code:22UCV316C

Hours/Week (L:T:P) : 1.0.0

PERSONALITY DEVELOPMENT FOR CIVIL ENGINEERS

CIE Marks : 50

01

SEE Marks : 50

Total Hours of Pedagogy (Theory+Lab): 15

Course Type: Theory

| Course Objectives: | | | | | | | | | |
|---|-----------------|--|--|--|--|--|--|--|--|
| To offer placement focused guidance across interview best practices, | | | | | | | | | |
| formalcommunication, and business etiquette | | | | | | | | | |
| Togive learnersa comprehensive understandingof job skillsand knowledgeth | nat are | | | | | | | | |
| Essential for adapting to changes in workplace | | | | | | | | | |
| Module - 1 | 3 Hrs. | | | | | | | | |
| LSRWandPersonalityDevelopment:ImportanceofLSRWSkills:Artoflistening-Listening | | | | | | | | | |
| comprehension – Art of Speaking – Art of Reading – Reading comprehension – ArtofW | /riting– | | | | | | | | |
| emailwritingPersonalityDevelopment:EmotionalIntelligence–SelfAwareness | | | | | | | | | |
| – Self Management – Personal SWOT – Manners & Etiquette – Positive Attitude – | | | | | | | | | |
| eq:confidencebuildingInterpersonalSkills: Active Listening-Motivation-Flexibility-Patience Confidence | e– | | | | | | | | |
| Dependability–Adaptability–Interpersonal&Intrapersonalskills–Body Language | | | | | | | | | |
| Module - 2 | 3 Hrs. | | | | | | | | |
| NVC, Presentation and Teamwork: Non–Verbal Communication: Bodylanguage–Gesture | s – Postures – | | | | | | | | |
| Eye contact – Hand Shake – First impression – Proxemics FacialExpressionsPresentation | onSkills:4P'sof | | | | | | | | |
| Presentation–CommunicatingwithCredibility – Audience analysis and Building Rapport – Usage of | | | | | | | | | |
| Figures, diagrams & Charts – Presentingwith Confidence – Body Language in Presentation. | | | | | | | | | |
| Teamwork: What is a Team - Stages of aTeam–Benefitsof Teamwork & Collaboration– | Group vs | | | | | | | | |
| Team –Types ofTeams–Roles of the team. | | | | | | | | | |
| Module-3 | 3Hrs. | | | | | | | | |
| Etiquette and Management: Critical Thinking & Problem Solving: Core Skil | ls–Uses & | | | | | | | | |
| ImportanceofCriticalThinking–PrinciplesofCriticalThinking–FactsaboutProblemSolv | /ing– Skills | | | | | | | | |
| to use in Problem Solving Problem Solving Process – Barriers to Problem Solving. | | | | | | | | | |
| Time Management: Managing your time – Time wasters – Analyzing your Stre | ngths and | | | | | | | | |
| weakness Goal Setting-Why Goal Setting is important - SMART Goals - Type | s of Goals | | | | | | | | |
| BusinessEtiquette: TypesofEtiquette–ImportanceofEtiquette – Meeting Etique | tte Office | | | | | | | | |
| Etiquette–PhoneandemailEtiquette–WorkPlaceEtiquette. | | | | | | | | | |
| Module-4 | 3 Hrs. | | | | | | | | |
| Leadership: LeadershipSkills: WhatmakesaneffectiveLeader-RelationshipBuilding-Le | eader vs Boss | | | | | | | | |
| – Decision Making Skills – Innovation & Motivation – Dependability BusinessWriting | _ | | | | | | | | |
| How to improve your Business writing skills – Importance of Business writing how to | o write | | | | | | | | |
| effectively 5C's of Business writing 4 types of Business writing Conflict. | | | | | | | | | |
| Management: Strategies of Conflict Management – Best practices for Conflict Resolution | | | | | | | | | |
| | tion Stress | | | | | | | | |
| Management–Learn to say No –Importance of Conflict Management at WorkPlace. | tion Stress | | | | | | | | |
| Management–Learn to say No –Importance of Conflict Management at WorkPlace. | tion Stress | | | | | | | | |

| Module-5 | ıle-5 |
|----------|-------|
|----------|-------|

V GD, Creativity and Psychometry: Group Discussion: Types of GD – Attitude & being Proactive
 – Time management & how to stick to it – Importance of Listening - Do's & Don't s Creativity & Innovation: What is Creativity–What is Innovation–Difference between Creativity & Innovation
 – Categories and misconception of Creativity Psychometric Analysis: What is Psychometric

Analysis – Cognitive Skills – Importance of Personality Tests–Personality Profiling

Activity Based Learning (Suggested Activities in Class)/Practical Based learning

- Select a topic and write an essay
- Conduct group discussion

Suggested Learning resources

- Personality Development And SoftSkills, BarunKMitra, 2nd edition, Oxford University Press,2016
- 2. Power of Positive thinking, NormanVincentPeale, ISBN-13978-0091906382,RHUK,2016.
- 3. Magic of thinking Big, DavidJSchwartz,ISBN-13978-1785040474, Vermilion, 2016.

Course Outcomes:

CO1: Use English as a medium of communication ininterviews and in any professional working environment proficiently .

- CO2: Develop necessary skills to work in teams.
- CO3: Developcritical think and problem solving skills to Answer common interview questions.
- CO4: Able to Express leadership quality, confidence in bodylanguage and present with clarity
- CO5: Develop creativity and innovation skills

CO and PO Mapping

| Course Outcomes | Programme Outcomes | | | | | | | | | | | | | |
|-----------------|--------------------|---|---|---|---|---|---|---|---|----|----|----|--|--|
| Course Outcomes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| CO1 | 2 | 3 | | | | | | | | | | 2 | | |
| CO2 | 2 | 3 | | | | | | | | | | 2 | | |
| CO3 | 2 | 3 | | | | | | | | | | 2 | | |
| CO4 | 2 | 3 | | | | | | | | | | 2 | | |
| CO5 | 2 | 3 | | | | | | | | | | 2 | | |

| Course Code:22UHS317L | | Credit : 01 | | | | |
|--|------------------|------------------|--|--|--|--|
| Hours/Week (L:T:P:S) : 0:0:3:1 | Social Connect & | CIE Marks: 100 | | | | |
| TotalHoursofPedagogy :(40 hour Practical Session+15 hour Planning) | Responsibility | SEE Marks : - | | | | |
| | | Total Marks: 100 | | | | |
| Course Type: Theory | | · · | | | | |

Course objectives: The course will enable the students to:

- 1. Provide a formal platform for students to communicate and connect to the surrounding.
- 2. create a responsible connection with the society.
- 3. Understand the community in general in which they work.
- 4. Identify the needs and problems of the community and involve them in problem –solving.
- 5. Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems.
- 6. Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing community participation to acquire leadership qualities and democratic attitudes.

General Instructions - Pedagogy :

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

- 1. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the activities will develop students' theoretical and applied social and cultural skills.
- 2. State the need for activities and its present relevance in the society and Provide real-life examples.
- 3. Support and guide the students for self-planned activities.
- 4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students progress in real activities in the field.

Encourage the students for group work to improve their creative and analytical skills.

Contents:

The course is mainly activity-based that will offer a set of activities for the student that enables them to connect with fellow human beings, nature, society, and the world at large.

The course will engage students for interactive sessions, open mic, reading group, storytelling sessions, and semester long activities conducted by faculty mentors.

In the following a set of activities planned for the course have been listed:

| Module - 1 | 8 Hrs |
|------------|-------|
| | |

Plantation and adoption of a tree:

Plantation of a tree that will be adopted for four years by a group of BE / B.Tech students. (ONE STUDENT ONE TREE) They will also make an excerpt either as a documentary or a photo blog describing the plant's origin, its usage in daily life, its appearance in folklore and literature - Objectives, Visit, case study, report, outcomes.

| | | | | Мо | dule | - 2 | | | | | | | | | | | 8 Hrs. |
|--|---|-------------|-------------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|-------|--------|
| Heritage walk and crafts corner: Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing he city and its craftsman, photo blog and documentary on evolution and practice of various craft forms - – Dbjectives,Visit, case study, report, outcomes. | | | | | | | | | | | | | | | | | |
| | Module - 3 8 Hrs. | | | | | | | | | | | | | | | | |
| Organic farming and waste management: Usefulness of organic farming, wet waste management in neighboring villages, and implementation in the campus Objectives, Visit, case study, report, outcomes. | | | | | | | | | | | | | | | | | |
| Module - 4 8 H | | | | | | | | | 8 Hrs. | | | | | | | | |
| Water conservation: Knowing the present practices in the surrounding villages and implementation in the campus, documentary or photoblog presenting the current practices – Objectives, Visit, case study, report, outcomes | | | | | | | | | | | | | | | | | |
| | | | | Мо | dule | - 5 | | | | | | | | | | | 8 Hrs. |
| Course Outcomes: At the end of the course, the student will be able to: CO1: Communicate and connect to the surrounding. CO2: Create a responsible connection with the society. CO3: Involve in the community in general in which they work. CO4: Notice the needs and problems of the community and involve them in problem –solving. CO5: Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems. CO6: Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing | | | | | | | | | | | | | | | | | |
| | | | | СС |) P(| | lap | pin | g | | | | | | | | |
| | | P 0 1 | P 0 2 | РО 3 | P0 4 | PO 5 | PO 6 | РО 7 | PO 8 | PO 9 | PO1 0 | P01 1 | P01 2 | PSO 1 | PSO 2 | PSO 3 | |
| No | Programme Outcomes Course Outcomes | | | | | | | | | | | | | | | | |
| At th | e end of the course th | ie s | stu | den | ts w | vill k | be a | blet | to: | | | | | | | | |
| 1 | Understand concepts of Good Health and wellness (and its Beliefs). | | | | | | 1 | | | | | | | | | | |
| 2 | Demonstrate the abilities to build healthy, caring | | | | | | 2 | | | | | | | | | | |

| | relationships and life style. | | | | | | | | |
|---|---|--|--|---|--|--|--|--|--|
| 3 | Adopt the innovative & positive methods to avoid risks from harmful habits in their campus & outside the campus. | | | 3 | | | | | |
| 4 | Exhibit the abilities to fight against harmful diseases. | | | 3 | | | | | |

Activities:

Jamming session, open mic, and poetry: Platform to connect to others. Share the stories with others. Share the experience of Social Connect. Exhibit the talent like playing instruments, singing, one-act play, artpainting, and fine art.

PEDAGOGY:

The pedagogy will include interactive lectures, inspiring guest talks, field visits, social immersion, and a course project. Applying and synthesizing information from these sources to define the social problem to address and take up the solution as the course project, with your group. Social immersion with NGOs/social sections will be a key part of the course. Will all lead to the course project that will address the needs of the social sector?

COURSE TOPICS:

The course will introduce social context and various players in the social space, and present approaches discovering and understanding social needs. Social immersion and inspiring conversional will culminate i developing an actual, idea for problem-based intervention, based on an in-depth understanding of a key social problem.

Duration :

A total of 40 - 50 hrs engagement per semester is required for the 3rd semester of the B.E. /B.Tech. program. The students will be divided into groups. Each group will be handled by faculty mentor. Faculty mentor will design the activities (particularly Jamming sessions open mic ,and poetry)

Guideline for Assessment Process:

Continuous Internal Evaluation (CIE):

After completion of the course, the student shall prepare, with daily diary as reference, a comprehensive report in consultation with the mentor/s to indicate what he has observed and learned in the social connect period. The report should be signed by the mentor. The report shall be evaluated on the basis of the following criteria and/or other relevant criteria pertaining to the activity completed. Marks allotted for the diary are out of 50. Planning and scheduling the social connect Information/Data collected during the social connect Analysis of the information/data and report writing Considering all above points allotting the marks as mentioned below:

| Excellent | : 80 to 100 |
|------------------|---------------|
| Good | : 60 to 79 |
| Satisfactory | |
| : 40 to 59 | |
| Unsatisfactory a | nd fail : <39 |

Pedagogy – Guidelines :

It may differ depending on local resources available for the study as well as environment and climatic differences, location and time of execution.

| 1. | Plantation and adoption of a tree: | May be individua l or team | Farmers land/ parks / Villages / roadside/ community area / College campus etc | Site selection /proper consultation/Contin uous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics Of scheme and syllabus by Faculty |
|----|--|----------------------------------|--|---|--|---|
| 2. | Heritage walk and crafts corner: | May be individua l or team | Temples / monumental places / Villages/ City Areas / Grama panchayat/ public associations/Governm e nt Schemes officers/ campus etc | Site selection /proper consultation/Contin uous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics Of scheme and syllabus by Faculty |
| 3. | Organic farming and waste management: | May be individua l or team | Farmers land / parks / Villages visits / roadside/ community area / College campus etc | Group selection / proper consultation / Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics Of scheme and syllabus by Faculty |
| 4. | Water conservatio n: & conservation techniques | May be individua l or team | Villages/ City Areas / Grama panchayat/ public associations/Governm e nt Schemes officers / campus etc | site selection / proper consultation/Contin uous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics Of scheme and syllabus by Faculty |
| 5. | Food walk: Practices in society | May be individua l or team | Villages/ City Areas / Grama panchayat/ public associations/Governm e nt Schemes officers/ campus etc | Group selection / proper consultation / Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics Of scheme and syllabus by Faculty |

Plan of Action (Execution of Activities)

| Sl.NO | Practice Session |
|-------|--|
| | Description |
| 1 | Lecture session in field to start activities |
| 2 | Students Presentation on Ideas |
| 3 | Commencement of activity and its progress |
| 4 | Execution of Activity |
| 5 | Execution of Activity |
| 6 | Execution of Activity |
| 7 | Execution of Activity |
| 8 | Case study based Assessment, Individual performance |
| 9 | Sector/ Team wise study and its consolidation |
| 1 | Video based seminar for 10 minutes by each student At the end of semester with |
| 0 | Report. |
| • | Each student should do activities according to the scheme and syllabus. |

• At the end of semester student performance has to be evaluated by the faculty for the assigned activity progress and its completion.

• At last consolidated report of all activities from 1st to 5th, compiled report should be submitted as per the instructions and scheme.

Assessment Details for CIE (both CIE and SEE)

| Weightage | CIE – 100% | Implementation strategies of the project (NSS work). | | | | |
|---|------------|---|--|--|--|--|
| Field Visit, Plan, Discussion | 10 Marks | • The last report should be signed by NSS | | | | |
| Commencement of activities and its progress | 20 Marks | Officer, the HOD and principal. | | | | |
| Case study based Assessment Individual performance with report | 20 Marks | At last report should be evaluated by the NSS officer of the institute. Finally the consolidated marks sheet | | | | |
| Sector wise study & its consolidation 5*5 = 25 | 25 Marks | should be sent to the university and also to | | | | |
| Video based seminar for 10 minutes by each student At the end of semester with Report. Activities 1 to 5, 5*5 = 25 | 25 Marks | be made available at LIC visit. | | | | |
| Total marks for the course in each semester | 100 Marks | | | | | |
| For each activity, 20 marks CIE will be evaluated for IA marks at the end of semester, Report and assessment copy should be made available in the department. | | | | | | |
| Students should present the progress of the activities as per the schedule in the prescribed practical session in the field. | | | | | | |
| There should be positive progress in the vertical order for the benefit of society in general through activities. | | | | | | |

| 22UHS001M | | | Credit : 00 | | | | |
|--------------|--|--|----------------------------|--|--|--|--|
| L:T:P :0:0:2 | | YOGA | CIE Marks : 50 | | | | |
| Total Hour | rs Per Semester :26 | (COMMON TO ALL BRANCHES) | SEE Marks : 00 | | | | |
| Semester | | Course | | | | | |
| III Sem | Introduction of Brief introduction Rules and regularity Rules and regularity Misconceptions Suryanamaskara Different types a. Sitting b. Standing c. Proneline d. Supineline | Yoga, Aim and Objectives o on of yogic practices for com ations of yoga a of Asanas | f yoga, Prayer nmon man | | | | |
| IV Sem | Supineme Patanjali's Ashtanga Yoga Suryanamaskara Different types of Asanas a. Sitting b. Standing c. Proneline d. Supineline Sitting Pranayama Kapalbhati | | | | | | |
| V Sem | Patanjali's Ash Suryanamaskar Different types a. Sitting b. Standing c. Proneline d. Supineline 4) Kapalbhati 5) Pranayama 1) Patanjali's Ash 2) Suryanamaskar 3) Different types | tanga Yoga a of Asanas tanga Yoga a of Asanas | | | | | |
| VI Sem | 3) Different types of Asanas a. Sitting b. Standing c. Proneline d. Supineline 4) Kapalbhati 5) Pranayama 6) ShatKriyas | | | | | | |

Blown-Up Syllabus

| Semester | Title | Content | No. of Hours |
|------------------------------|---|---|-------------------------|
| | Introduction of Yoga, Aim and Objectives of yoga, Prayer | Yoga, its origin, history and development. Yoga, its meaning, definitions. Different schools of yoga, importance of prayer | |
| | Brief introduction of yogic practices for common man | Yogic practices for common man to promote Positive health | |
| | Rules and regulations | Rules to be followed during yogic practices by practitioner | Total 26hrs |
| 3 ^{rd.} Semester | Misconceptions of yoga | Yoga its misconceptions, Difference between yogic and non yogic practices | 2hrs/week |
| Semester | Suryanamaskara | Suryanamaskara prayer and its meaning, Need, Importance and benefits of Suryanamaskara 12 count, 2 rounds | |
| | Different types of Asanas a. Sitting 1.Padmasana 2.Vajrasana b. Standing 1.Vrikshana 2.Trikonasana c. Proneline 1.Bhujangasana 2.Shalabhasana d. Supineline 1.Utthitadvipadasana 2.Ardhahalasana | Asana, Need, Importance of Asana. Different types of asanas. Asana its meaning by name, technique precautionary measures and benefits of each asana | |
| th | Patanjali's Ashtanga Yoga 1. Yama 2. Niyama | Patanjali's Ashtanga Yoga its need and importance. Yama: Ahimsa, satya, asteya, brahmacarya, aparigraha Niyama: shoucha, santosh, tapa, svaadhyaya, Eshvarapranidhan | |
| 4 th Semester | Suryanamaskara Different types of Asanas a. Sitting1.Sukhasana 2. Paschimottanasana b. Standing1.ArdhakatiChakrasana 2. ParshvaChakrasana c. Proneline 1.Dhanurasana d. Supineline1.Halasana 2.KarnaPeedasana | Suryanamaskar 12 count 4 rounds Asana, Need, importance of Asana. Different types of asanas. Asana its meaning by name, technique, precautionary measures and benefits of each asana | Total 26hrs 2hr/Week |
| | Kapalabhati | Meaning, importance and benefits of Kapalabhati. 40strokes/min 3rounds | |
| | Pranayama–1. 1. Suryanuloma –Viloma 2. Chandranuloma-Viloma 3. Suryabhedana 4. ChandraBhedana 5. Nadishodhana | Meaning, Need, importance of Pranayama. Different types. Meaning byname, technique, precautionary measures and benefits of each Pranayama | |

| | Ashtanga Yoga | Patanjali's Ashtanga Yoga its need | |
|-----------------|--|--|-------------|
| | 3.Asana | and importance. | |
| | 4.Pranayama 5. Protychoro | 1 | |
| | 6.Dharana | | |
| | Suryanamaskara | Suryanamaskara 12count 6rounds | - |
| 5 th | Different types of Asanas | Asana, Need, importance of Asana. | |
| 5 Somoston | a. Sitting 1. ArdhaUshtrasana | Different types. Asana its meaning | Total |
| Semester | 2.Vakrasana | by name, technique, precautionary | 26hrs |
| | b. Standing 1.UrdhvaHastothanasana 2.Hastapadasana c. Proneline 1.Padangushtha 2. Dhanurasana | measures and benefits of each asana | 2hrs/week |
| | d. Supineline 1.Sarvangasana 2.Chakraasana | | |
| | Kapalabhati | Revision of practice 50strokes/min 3rounds | |
| | Pranayama–1.SuryaBhedana | Meaning, Need, importance of | |
| | 2.Ujjayi | Pranayama. Different types. | |
| | | Meaning by name, technique, | |
| | | Precautionary measures and | |
| | | benefits of each Pranayama | |
| | Ashtanga Yoga | Patanjali's Ashtanga Yoga its | |
| | 7.Dhyana(Meditation) 8 Samadhi | need and importance. | |
| | Survanamaskara | Revision of practice 12 count | - |
| | Surgananashara | 8 rounds | |
| 6 th | Different types of Asanas | Asana, Need importance of | |
| Semester | a. Sitting1. AakarnaDhanurasana | Asana by name, technique, | |
| | 2. I Ogaliludralil Padilasana b. Standing, 1 Parivritta | precautionary erasures and | |
| | 0. Standing 1.1 arvinua 2 Trikonasana | benefits of each asana. | Total 26hrs |
| | 2. Hikohasana 3. Utkatasana | | 2hrs/ week |
| | 5. Utkatasalla Propeline 1 Poorna Bhujangasana | | |
| | /Rajakapotasana | | |
| | d. Supineline1.Navasana/Noukasana | | |
| | 2.Pavanamuktasana | | |
| | Kapalabhati | Revision of practice 60 strokes/min 3rounds | _ |
| | Pranayama– 1.Sheetali 2 Sheektari | Meaning, Need, importance of | |
| | 3. Bhastrika | Pranayama. Different types. | |
| | 4. Bhramari | Meaning by name, technique, | |
| | | precautionary | |
| | | Pranavama | |
| | ShatKriyas | Meaning Need importance of | 1 |
| | 1. Jalaneti & sutraneti | ShatKrivas, Different types. Meaning | |
| | 2. Nouli(onlyformen) | by name, technique, precautionary | |
| | 3 Sheet karma Kapalabhati | measures and benefits of each Kriva. | |
| | | , see the second s | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Book for Reference:

1. Swami Kuvulyananda :Asma(Kavalyadhama,Lonavala) :Asana Why and How 2. Tiwari, OP 3. Ajitkumar : Yoga Pravesha(Kannada) 4. Swami Satyananda Saraswati :Asana Pranayama, Mudra, Bandha (Bihar School of yoga, Munger) 5. Swami Satyananda Saraswati :SuryaNamaskar (Bihar School of yoga, Munger) 6. Nagendra HR :Theart and science of Pranayama 7. Tiruka :Shatkriyegalu(Kannada) :YogaPradipika(Kannada) 8. Iyengar BKS 9. Iyengar BKS :Light on Yoga(English) : Samagra Yoga Darshini(Kannada) 10. S.K. Kuppasta

Scheme of Assessment:

| WEIGHTAGE | 100% |
|--|------|
| | CIE |
| At the End of 3 rd Semester | 25 |
| At the End of 4 th Semester | 25 |
| At the End of 5 th Semester | 25 |
| At the End of 6 th Semester | 25 |
| TOTALMARKS FOR THECOURSE | 100 |

Note: 1. No Semester End Examinations.

L:T:P :0:0:2

National Service Scheme

Credit: 00

CIE Marks : 50

(NSS)

Total Hours Per Semester :26

(COMMON TO ALL BRANCHES)

SEE Marks :00

Corse Objectives: National Service Scheme (NSS) will enable the students to:

Course objectives: National Service Scheme (NSS) will enable the students to:

- 1. Understand the community in general in which they work.
- 2. Identify the needs and problems of the community and involve them in problem –solving.
- 3. Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems.
- 4. Develop competence required for group-living and sharing of responsibilities & gain in mobilizing community participation to acquire leadership qualities and democratic attitudes.
- 5. Develop capacity to meet emergencies and natural disasters & practice national integration and social harmony in general.

Contents 26 Hours Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing. 1. 2. Waste management– Public, Private and Govt organization, 5 R's. 3. Setting of the information imparting club for women leading to contribution in social and economic issues. 4. Water conservation techniques – Role of different stakeholders– Implementation. 5. Preparing an actionable business proposal for enhancing the village income and approach for implementation. Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/ 6. vocational education. 7. Developing Sustainable Water management system for rural areas and implementation approaches. 8. Contribution to any national level initiative of Government of India. For eg. Digital India, Skill India, Swachh Bharat, Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc. 9. Spreading public awareness under rural outreach programs.(minimum5 programs). Social connect and responsibilities. 10.

11. Plantation and adoption of plants. Know your plants.

12. Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs).

13. Govt. school Rejuvenation and helping them to achieve good infrastructure.

NOTE:

- Student/s in individual or in a group Should select any one activity in the beginning of each semester till end of that respective semester for successful completion as per the instructions of NSS officer with the consent of HOD of the department.
- At the end of every semester, activity report should be Submitted for evaluation.

Course outcomes (Course Skill Set):

At the end of the course, the student will be able to:

- CO1: Understand the importance of his / her responsibilities towards society.
- CO2: Analyse the environmental and societal problems/issues and will be able to design solutions For the same
- CO3: Evaluate the existing system and to propose practical solutions for the same for sustainable development.
- CO4: Implement government or self-driven projects effectively in the field.
- CO5: Develop capacity to meet emergencies and natural disasters & practice national integration and social harmony in general.

ASSESSMENTANDEVALUATIONPATTERN

| WEIGHTAGE | 100% |
|--|------|
| | CIE |
| At the End of 3 rd Semester | 25 |
| At the End of 4 th Semester | 25 |
| At the End of 5 th Semester | 25 |
| At the End of 6 th Semester | 25 |
| TOTAL MARKS FOR THE COURSE | 100 |

Blown-Up Syllabus

| Distribution of Activities - Semester wise from 3 ^{rd.} to 6 th semester | | | | | | | |
|--|---|--|--|--|--|--|--|
| Semester | Topics / Activities to be Covered | | | | | | |
| 3rd. Semester | Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing. Waste management- Public, Private and Govt organization, 5 R's. Setting of the information imparting club for women leading to contribution in social and economic issues. | | | | | | |
| | 4. Water conservation techniques – Role of different stakeholders– Implementation. | | | | | | |
| 4th | 5. Preparing an actionable business proposal for enhancing the village income and approach for implementation. | | | | | | |
| Semester | 6. Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/vocational education. | | | | | | |
| | 7. Developing Sustainable Water management system for rural areas and implementation approaches. | | | | | | |
| _ | 8. Contribution to any national level initiative of Government of India. For eg. Digital India, Skill | | | | | | |
| 5 th Semester | India, Swachh Bharat, Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc. | | | | | | |
| | 9. Spreading public awareness under rural outreach programs.(minimum5 programs). | | | | | | |
| | 10. Social connect and responsibilities. | | | | | | |
| 64 | 11. Plantation and adoption of plants. Know your plants. | | | | | | |
| Semester | 12. Organize National integration and social harmony events /workshops /Seminars. (Minimum 02 programs). | | | | | | |
| | 13. Govt. school Rejuvenation and helping them to achieve good infrastructure. | | | | | | |

| SI No | Торіс | Group size | Location | Activity execution | Reporting | Evaluation Of the Topic |
|----------|---|---------------------------------|---|---|--|---|
| 1. | Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing. | May be individual or team | Farmers land/Villages / roadside/ community area/ College campus etc | Site selection /Proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 2. | Waste management– Public, Private and Govt organization, 5 R's. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Site selection /proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 3. | Setting of the information imparting club for women leading to contribution in social and economic issues. | May be individual or team | Women empowerment groups/ Consulting NGOs & Govt Teams / College campus etc. | Group selection/proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 4. | Water conservation techniques – Role of different stakeholders– Implementation. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | site selection / proper consultation/ Continuous monitoring/ Information board. | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |

| 5. | Preparing an actionable business proposal for enhancing the village income and approach for implementation. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Group selection/proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
|----|---|---------------------------------|--|---|--|---|
|----|---|---------------------------------|--|---|--|---|

| 6. | HelpinglocalschoolstoachievegoodresultsandenhancetheirenrolmentinHigher/ technical/vocational | May be individual or team | Local government / private/ aided schools/Govern- ment Schemes officers/ etc | School selection/proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
|----|---|---------------------------------|--|--|--|---|
| | education. | | | | | |
| 7. | Developing Sustainable Water management system for rural areas and implementation approaches. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | site selection/proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 8. | Contribution to any national level initiative of Government of India. For eg. Digital India, Skill India, Swachh Bharat, Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Group selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 9. | Spreading public awareness under rural outreach programs. (minimum 5 programs). Social connect and responsibilities. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Group selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 10. | Plantation and adoption of plants. Know your plants. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Place selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
|-----|---|---------------------------------|--|--|--|---|
| 11. | Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs). | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Place selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 12. | Govt. school Rejuvenation and helping them to achieve good infrastructure. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Place selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |

| Sl. NO | Practice Session Description |
|--------|--|
| 1 | Lecture session by NSS Officer |
| 2 | Students Presentation on Topics |
| 3 | Presentation - 1 ,Selection of topic, PHASE - 1 |
| 4 | Commencement of activity and its progress - PHASE - 2 |
| 5 | Execution of Activity |
| 6 | Execution of Activity |
| 7 | Execution of Activity |
| 8 | Execution of Activity |
| 9 | Execution of Activity |
| 10 | Case study based Assessment, Individual performance |
| 11 | Sector wise study and its consolidation |
| 12 | Video based seminar for 10 minutes by each student at the end of semester with |
| | Report. |

Pedagogy – Guidelines, it may differ depending on local resources available for the study as well as environment and climatic differences as well as location time of execution.

Plan of Action (Execution of Activities For Each Semester)

| | | | | Semester:III | | | | |
|-------------------------------|--|------------|-----------------------------------|-------------------------------------|-----------------------------|-------------------------|----------------|--|
| PHYSICAL EDUCATION AND SPORTS | | | | | | | | |
| Course | Code | : | 22UHS003M | | CIE | : | 100 marks | |
| Credits:L:T:P | | : | 0:0:2 | | | | | |
| Total Hours : 24P | | | | | | | | |
| 1. 2. 3. 5. 6. | Understand the fundamental concepts and skill s of Physical Education, Health, Nutrition and Fitness Familiarization of health - related Exercises, Sports for overall growth and development Createa foundation for the professional sin Physical Education and Sports 4. Participate in the competition at regional/state/national/international levels. Create consciousness among the students on Health, Fitness and Wellness in developing and maintaining a healthy lifestyle. Understand and practice of Traditional Games | | | | | | | |
| Module A. B. | I:Orienta Lifestyle Health& | tio Wel | n lness | | | | 4Hours | |
| C. | Pre-Fitne | sste | est. | | | | | |
| Module A. B. C. | ModuleII:GeneralFitness&ComponentsofFitness4HoursA. Warmingup(FreeHandexercises)B. Strength–Push-up/Pull-upsC. Speed–30MtrDash | | | | | | | |
| Module | II:Specifi | cga | mes(Anyonetol | peselectedbyth | estudent] |) | 16Hours | |
| | 1. Kaba 2. Kho- | ddi Kho | –Handtouch,Toe –GivingKho, Sir | Fouch, ThighHol ngle Chain, Pole | d, Ankle ho dive, Poleti | old and B urning, 3- | onus. -6Up. | |

Scheme and Assessment for auditingthecourseandGrades:

| Sl.No. | Activity | Marks |
|--------|---|-------|
| 1. | Participation of student in all the modules | 20 |
| 2. | Quizzes–2, each of 15 marks | 30 |
| 3. | Final presentation / exhibition / Participation in competitions/ practical on specific tasks assigned to the students | 50 |
| | Total | 100 |

| | Semester:IV | | | | | | | | | |
|---|---|----------------|---|---------------------------------|-------------------------------|--------------------|-----------|---------|--|--|
| | PHYSICALEDUCATION(SPORTS&ATHLETICS)-II | | | | | | | | | |
| CourseCode : BPEK459 CIE : 100Marks | | | | | | | | | | |
| Credits:L:T:P : 0:0:2 | | | | | | | | | | |
| TotalHours : 24P | | | | | | | | | | |
| Course | eOutcom | nes:A | Attheendofthecourse, | ,thestudentwi | llbeableto | | | | | |
| 1. 2. 3. | Understand thee thics and moral values in sports and athletics Perform in the selected sports or athletics of student's choice. Understand the roles and responsibilities of organisation and administration of sports and games. | | | | | | | | | |
| Module | I: Ethics | sand | MoralValues | | | | | 4Hours | | |
| А. | Ethics in | n Spo | orts | | | | | | | |
| В. | Moral V | alue | s in Sports andGame | es | | | | | | |
| Modulel | I: Specif | fic G | ames(Anyone to b | e selected b | y the stud | ent) | | 16Hours | | |
| А. В. | Volleyba Athletic | all–A s(Tra | Attack, Block, Servic ackEvents)–Any eve | ce, Upper Har ent as per ava | nd Pass and ilability of (| Lower h Ground. | and Pass. | | | |
| Modulel | ModuleIII: Role of Organisation and administration 4Hours | | | | | | | | | |

Scheme and Assessment for auditing the course and Grades:

| Sl.No. | Activity | Marks |
|--------|---|-------|
| 1. | Participation of student in all the modules | 20 |
| 2. | Quizzes–2, each of 15marks | 30 |
| 3. | Final presentation / exhibition / Participation in competitions/ practical on specific tasks assigned to the students | 50 |
| | Total | 100 |

| Semester:V | | | | | | | |
|--|---|---------|--|-----|---|----------|--|
| PHYSICAL EDUCATION(SPORTS&ATHLETICS)-I | | | | | | | |
| CourseCode | : | BPEK559 | | CIE | : | 100Marks | |
| Credits:L:T:P | : | 0:0:2 | | | | | |
| TotalHours | : | 24P | | | | | |

CourseOutcomes: At the end of the course, the student will be able to

- 1. Understand the fundamental concepts and skills of Physical Education, Health, Food, Nutrition and general fitness.
- 2. Familiarization of health-related Exercises, Sports for overall growth and development
- 3. Createa foundation for the professionals in Physical Education and Sports
- 4. Participate in the competition at regional/state/national/international levels.
- 5. Understand and practice of specific games and athletic throwing events.

Module I: Orientation

4Hours

- A. Fitness
- B. Food&Nutrition

| Sl.No. | Activity | Marks |
|--------|---|-------|
| 1. | Participation of student in all the modules | 20 |
| 2. | Quizzes–2, each of 15 marks | 30 |
| 3. | Final presentation/exhibition/Participation in competitions/ practical on specific tasks assigned to the students | 50 |
| | Total | 100 |

Module II: General Fitness&Components of Fitness

- A. Agility-ShuttleRun
- B. Flexibility-SitandReach
- C. Cardiovascular Endurance-HarvardstepTest

Module III: Specificgames (Anyone to be selected by the student)

16Hours

- 1. Badminton(Forehandlow/highservice, backh and service, smash, drop)
- 2. Basketball(Dribbling, passing, shooting etc.)
- 3. Athletics(Fieldevents–Throws)

Scheme and Assessment for auditing the course and Grades:

| | | | Semester:VI | | | | | |
|--|---|--------------------|--------------------|--------------|-----------|----------|--|--|
| PHYSICAL EDUCATION(SPORTS&ATHLETICS)-II | | | | | | | | |
| CourseCode | : | BPEK659 | | CIE | : | 100Marks | | |
| Credits:L:T:P | : | 0:0:2 | | | | | | |
| TotalHours | : | 24P | | | | | | |
| Course Out con | ies | :At the end of the | e course, the stud | lent will be | able to | | | |
| Unde Partic Partic Unde Unde Unde Unde Unde Unde Unde Stress ModuleV: Specific Throwba TableTer | Course Out comes :At the end of the course, the student will be able to 1. Understand thePostural deformities and Stress management in sports and athletics 2. Participate in the competition at regional/state/national/international levels. 3. Understand and practice of specific games and athletic Jumping events. 4. Understand and practice of Aerobics. ModuleIV: Orientation 4Hours 1. Postural deformities. 2. Stress management ModuleV: Specific Games(Any one to be selected by the student) 1. Throwball | | | | | | | |
| 3. Athletics | 5(F1 | eldEvents-Jumps |)–Any event as p | per availabi | lity of G | round. | | |
| | | | | | | | | |
| ModuleVI: A | ero | obics | | | | 4Hours | | |

Scheme and Assessment for auditing the course and Grades:

| Sl.No. | Activity | Marks |
|--------|---|-------|
| 1. | Participation of student in all the modules | 20 |
| 2. | Quizzes–2, each of 15 marks | 30 |
| 3. | Final presentation / exhibition / Participation in competitions/ practical on specific tasks assigned to the students | 50 |
| | Total | 100 |

| | Basaveshwar Engineering College, Bagalkote | | | | | | | | | | | | |
|----------------------|--|------------------------|--|--|-------------------|----------|------------------------------------|--------|---------------------------------|---------|----------|------------|--------|
| | Department of Civil Engineering | | | | | | | | | | | | |
| | Scheme of Teaching and Examinations-2022 Outcome-Based Education (OBE) and Choice Based Credit System (CBCS) | | | | | | | | | | | | |
| | (Effective from the academic year 2024-25) | | | | | | | | | | | | |
| IV S | V SEMESTER | | | | | | | | | | | | |
| | | | | 5 | | Teachi | ng Hours | / Week | | Exam | ination | | |
| SI. No | Sl. Course and Io Course Code | | Course Title | Teaching Department (TD) and Question Papei Setting Board (PSB) | Theory Lecture | Tutorial | Practical Drawing Self-Study | | Duration in hours E Marks | | EE Marks | otal Marks | redits |
| | 200 | | | | L | T | Р | S | | C To | S | F | 0 |
| 1 | PCC | 22UCV410C | Analysis of Structures | TD:CVPSB:CV | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 2 | IPCC | 22UCV411C | Fluid Mechanics and Hydraulics | TD:CVPSB:CV | 3 | 0 | 2 | | 05 | 50 | 50 | 100 | 4 |
| 3 | IPCC | 22UCV412C | Transportation Engineering | TD:CVPSB:CV | 3 | 0 | 2 | | 05 | 50 | 50 | 100 | 4 |
| 4 | PCCL | 22UCV413L | Building Materials Testing Lab | TD:CVPSB:CV | 0 | 0 | 2 | | 02 | 50 | 50 | 100 | 1 |
| 5 | ESC | 22UCV414X 22UCV414C | ESC/ETC/PLC Concreting Techniques & Practices | | 2 | 2 | 0 | | 04 | 50 | 50 | 100 | 3 |
| 6 | AEC/ SEC | 22UCV415X 22UCV415L | Ability Enhancement Course/Skill Enhancement Course-IV GIS with Quantum GIS Lab | TD and PSB: Concerned department | 0 | 0 | 2 | | 02 | 50 | 50 | 100 | 1 |
| 7 | BSC | 22UBT441C | Biology For Engineers | TD/PSB:BT, CHE, | 3 | 0 | 0 | | 03 | 50 | 50 | 100 | 3 |
| 8 | UHV | 22UHS424C | Universal human values | Any Department | 1 | 0 | 0 | | 01 | 50 | 50 | 100 | 1 |
| | | 22UHS002M | National Service Scheme (NSS) | NSS coordinator | | | | | | | | | |
| 9 | МС | 22UHS003M | Physical Education (PE) (Sports and Athletics) | Physical Education Director | 0 | 0 | 2 | | | 100 | | 100 | 0 |
| | | 22UHS001M | Yoga | Yoga Teacher | | | | | | | | | |
| | | 22UHS004M | Music | Music Teacher | | | | | | | | | |
| | Total 500 400 900 20 | | | | | | | | | | | | |
| PCC: AEC Evalu | Total 500 400 900 20 PCC: Professional Core Course, PCCL : Professional Core Course laboratory, UHV: Universal Human Value Course, MC : Mandatory Course (Non - credit), AEC : Ability Enhancement Course, SEC : Skill Enhancement Course, L:Lecture, T:Tutorial, P:Practical S=SDA: Skill Development Activity, CIE: Continuous Internal Evaluation, SEE : Semester End Evaluation, K: This letter in the course code indicates common to all the stream of engineering | | | | | | | | | | | | |

| | Ability Enhancement Course / Skill Enhancement Course -IV | | | | | | | | |
|--|---|-------------------|--|--|--|--|--|--|--|
| 22UCV415A | Building Information Modeling in Civil Engineering – Basics (0:0:2) | 22UCV415C | Electronic Waste Management – Issues and Challenges | | | | | | |
| 22UCV415L | GIS with Quantum GIS Lab | 22UCV415D | Technical Writing Skills | | | | | | |
| | Engineering Science Cou | urse (ESC/ETC) | /PLC) | | | | | | |
| 22UCV414A | Finance for Professionals | 22UCV414C | Concreting Techniques & Practices | | | | | | |
| 22UCV414B | Construction Equipment, Plants and Machinery | 22UCV414D | Watershed Management | | | | | | |
| Professional | Core Course (IPCC): Refers to Professional Core Course Theory In | tegrated with p | practical of the same course. Credit for IPCC can be 04 and its | | | | | | |
| Teaching-Lean | rning hours $(L : T : P)$ can be considered as $(3 : 0 : 2)$ or $(2 : 2 : 2)$. The | e theory part of | the IPCC shall be evaluated both by CIE and SEE. The practical | | | | | | |
| part shall be e | valuated by only CIE (no SEE). However, questions from the practi | cal part of IPCC | c shall be included in the SEE question paper. For more details, | | | | | | |
| the regulation | governing the Degree of Bachelor of Engineering /Technology (B.E./I | B.Tech.)2022-2 | 3 | | | | | | |
| National Serv | rice Scheme /Physical Education/Yoga :All students have to regist | er for any one | of the courses namely National Service Scheme (NSS), Physical | | | | | | |
| Education(PE) | (Sports and Athletics), and Yoga(YOG) with the concerned coordin | ator of the cou | rse during the first Week of III semesters. Activities shall be | | | | | | |
| carried out be | tween III semesters to the VI semester (for 4 semesters). Successful | completion of | the registered course and requisite CIE score is mandatory for | | | | | | |
| the award of the Degree. The events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and | | | | | | | | | |
| Yoga activities | s. These courses shall not be considered for vertical progression as v | vell as for the c | alculation of SGPA and CGPA, but completion of the courses is | | | | | | |
| mandatory for the award of Degree. | | | | | | | | | |

| Analysis | s of Structures | Semester | IV |
|--|--|---------------------|------------|
| Cours eCode | 22UCV410C | CIE Marks | 50 |
| Teaching Hours/Week(L:T:P:S) | 03 | SEE Marks | 50 |
| Total Hours of Pedagogy | 3:0:0:0 | Total Marks | 100 |
| Credits | | Exam Hours | 03 |
| Course Learning objectives. T | his source will enable students to | rm-work/outers | |
| Course Learning objectives. 1 | ins course will enable students to | | |
| • Understand the Different | t Forms of Structural Systems. | | |
| • Determine the Strain End | ergy and Slope and Deflection of Beams | ,Trusses and Fran | nes. |
| • Analyse arches and cable | e structures. | | |
| • Analyse different types of | of beams and frames using slope deflecti | on method. | |
| • Analyse different types of | of beams and frames using moment distr | ibution method. | |
| Teaching-LearningProcess(C | eneralInstructions) | | |
| These are sample Strategies; w | hich teacher can use to accelerate the att | ainment of the va | rious |
| course outcomes. | | | |
| 1. Apart from conventional le | cture methods various types of innovativ | ve teaching techni | iques |
| through videos, animation | films may be adopted so that the deli | vered less on can | |
| progress the students in the | coretical, applied and practical skills. | | |
| Arrange field visits to give Encourage collaborative(Ask at least three HOTS (H | brief information about the water and w Group Learning) Learning in the class. Higher-order Thinking) questions in the c | aste water treatme | ent plant. |
| promotescritical thinking a | nd enhance the knowledge of treatment | processes. | |
| 5. Adopt Problem Based Lear | ming (PBL), which fosters students, Ana | lytical skills, dev | elop |
| thinking skills such as the | abilitytoevaluate, generalize, andanaly | ze information ra | ather |
| than simply recall it. | | | |
| 6. Seminars, surprise tests and | d Quizzes may be arranged for students | in respective subj | ects to |
| develop skills | | | |
| | Module-1 | | |
| Introduction and Analysis of | f Plane Trusses: Structural forms, Con | nditions of equili | brium, |
| Compatibility conditions, Deg | gree of freedom, Linear and nonline | ar analysis, Stat | ic and |
| kinematic indeterminacies of s | structural systems, Types of trusses, A | ssumptions in ar | nalysis, |
| Analysis of determinate trusses | by method of joint sand method of secti | ons. | 08 hrs |

Module-2

DEFLECTION OF BEAMS: Moment area method: Derivation, Mohr's theorems, sign convention; Application of moment area method to determinate prismatic beams, beams of varying cross section; Use of moment diagram by parts.

Strain Energy: Principle of virtual displacements, Principle of virtual forces, Strain energy and complimentary energy, Strain energy due to axial force, bending, shear and torsion (No numerical). Castigliano's theorems, application of Castigliano's theorems to calculate deflection of beams,trussesandframes(Nonumericalonunitloadmethod).

Module - 3

Arches and Cable Structures: Three hinged parabolic arches with supports at the same anddifferent levels. Determination of normal thrust, radial shear and bending moment. Analysis ofcables under point loads and UDL. Length of cables for supports at same and at differentlevels-Stiffeningtrussesforsuspensioncables.08 hrs

Module - 4

Slope Deflection Method: Introduction, sign convention, development of slope deflection equation; Analysis of continuous beams including settlement of supports; Analysis oforthogonal rigidplaneframesincludingswayframeswithkinematicindeterminacyupto3 **08 hrs**

Module - 5

Moment Distribution Method:Introduction, Definition of terms, Development of method,Analysis of continuous beams with support yielding, Analysis of orthogonal rigid plane framesincludingswayframeswithkinematicindeterminacyupto308 hrs

Course out come (Course Skill Set)

At the end of the course, the student will be able to:

- 1. Identify the different forms of structural systems and analyse the trusses.
- 2. Evaluate the slope and deflections in beams, frames and trusses by using moment area method and energy principle.
- 3. Analyse and determine the stress resultants in arches and cables.
- 4. Analyse the indeterminate structures and construct BMD AND SFD using slope deflection methods.
- 5. Analyse the indeterminate structures and construct BMD AND SFD using Moment Distribution Method.

Suggested Learning Resources:

Books

- 1. Reddy, C. S., Basic Structural Analysis, 3rd. ed., TataMcGraw Hill Education Pvt.Ltd., NewDelhi, 2011.
- 2. Hibbeler, R. C., Structural Analysis, 9th edition., Pearson publications., NewDelhi, 2012.
- 3. Thandavamoorthy, T. S., Structural Analysis, 6th edition., Oxford University press., NewDelhi, 2015.
- 4. LSNegiandRSJangid, "Structural Analysis", TataMcGraw Hill Publishing Company Ltd.
- 5. DSPrakashRao, "Structural Analysis: A Unified Approach", Universities Press 4
- 6. K. U. MuthuandH. Narendra, "Indeterminate Structural Analysis", IK International Publishing Pvt. Ltd.
- 7. Gupta S P, G S Pundit and R Gupta, "Theory of Structures", Vol II, Tata McGraw Hill Publications company Ltd.
- 8. VNVaziraniandMMRatwani, "Analysis of Structures", Vol. 2, Khanna Publishers.
- 9. Wang C K, "Intermediate Structural Analysis", McGraw Hill, International Students Edition.S. Rajashekhara and G. Sankarasubramanian, "Computational Structural Mechanics", PHI Learning Pvt. Ltd.,
- 10. SSBhavikatti, structuralanalysis, vikas publishing house pvt. ltd., newDelhi SRamamruthamandRNarayanan, Theory of structures, DhanpatRai Publishing Company.

| | Ma | apping | g of C | ourse | Out o | comes | and l | Progr | am sp | ecific | out co | mes to | Progra | m Outc | omes | |
|------------|---|-------------------------------------|--------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|------|-----|
| Course | Program out comes Program Specific Out comes | | | | | | | | | | | | | | | |
| out comes | PO | PO | | | | | | | | | | | | PSO | PSO | PSO |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 |
| CO1 | 3 | 3 | 3 | | | | | | | | | 1 | 2 | 1 | | |
| CO2 | 3 | 3 | 3 | | | | | | | | | 1 | 2 | 1 | | |
| CO3 | 3 | 3 | 3 | | | | | | | | | 1 | 2 | 1 | | |
| CO4 | 3 | 3 | 3 | | | | | | | | | 1 | 2 | 1 | | |
| CO5 | 3 | 3 | 3 | | | | | | | | | 1 | 2 | 1 | | |
| Total | 3 | 3 | 3 | | | | | | | | | 1 | 2 | 1 | | |
| Average | 3 3 3 1 1 2 1 | | | | | | | | | | | | | | | |
| Level0: | Level0:Not Mapped, 1: LowMapped, 2:ModeratelyMapped 3:Highly Mapped | | | | | | | | | | | | | | | |

<u>CO&PSO-PO Mapping</u> (Individual Teacherhas to fill)

| FLUID MECHANICS | S AND HYDRAULICS | Semester | IV | | | | | | | |
|---|---|---|-------------------------|--|--|--|--|--|--|--|
| Course Code | 22UCV411C | CIE Marks | 50 | | | | | | | |
| Teaching Hours/Week(L:T:P:S) | 3:0:2:0 | SEE Marks | 50 | | | | | | | |
| Total Hours of Pedagogy | 40+8-10Lab slots | Total Marks | 100 | | | | | | | |
| Credits | 04 | Exam Hours | 3 | | | | | | | |
| Course outcomes: At the end of the course, the student will be able to: Explain the fundamental properties of fluids and solve problems on fluid pressure and hydrostatics. Apply the principles of kinematics and dynamics of fluid flow to solve problems on velocity and pressure. Compute the discharge through pipes, notches, and weirs. Design the turbines and open channels of different sections and estimate the energy loss in hydraulic jump. Able to interpret the experimental results of discharge, efficiency based on the tests conducted in the laboratory. MODULE-1 8Hrs Fluids and their properties – compressibility, surface tension, capillarity, Pascal's law, hydrostatic law, fluid and their properties – to be a first of the conducted in the laboratory. 8 Monormal conduction of the conduction of the | | | | | | | | | | |
| center of pressure on vertical and | inclined plane surfaces. MODULE-2 | tal pressure and | L2,L3 8Hrs | | | | | | | |
| Kinematics - Types of flow, cont function, flow nets. Dynamics - E Application - Venturimeter, Orific | inuity equation in Cartesian coordinate culer's equation of motion, Bernoulli's o ce meter, Pitot tube. | s, velocity potent equation. | ial, stream L2,L4 | | | | | | | |
| | MODULE-3 | | 8Hrs | | | | | | | |
| Classification of orifice and mouthpiece, hydraulic coefficients, discharge over rectangular, triangular and Cipoletti notch, Flow through pipes- major and minor losses, pipes in series and parallel, equivalent pipe, concept of water hammer and surge tanks L2,L4 | | | | | | | | | | |
| | MODULE-4 | | 8Hrs | | | | | | | |
| Open channel hydraulics - Classi triangular, trapezoidal, and circular flow, hydraulic jump - equation ar | fication of flow, Most economical char r. Uniform flow, specific energy - rectan ad applications, GVF equation - types. | nnel sections - re gular channels, no L2,L4 | ctangular, onuniform | | | | | | | |
| | MODULE-5 | | 8Hrs | | | | | | | |
| Momentum equation, impact of jet on stationary and moving curved vanes Turbines-types, Pelton wheel-working proportions, velocity triangles Francis turbine- working proportions, velocity triangles Centrifugal pumps-work done, efficiency, multi-stage pumps. L2,L4 | | | | | | | | | | |

PRACTICAL COMPONENT OF IPCC

| SI. NO | Experiments | |
|--------|---|-------|
| 1 | Verification of Bernoulli's equation | L1,L2 |
| 2 | Calibration of Venturimeter / Orificemeter | L1,L2 |
| 3 | Determination of hydraulic coefficients of small vertical orifice | L1,L2 |
| 4 | Calibration of triangular notch | L1,L2 |
| 5 | Determination of Cd for Cipoletti notch | L1,L2 |
| 6 | Determination of major losses in pipes | L1,L2 |
| 7 | Determination of Cd for ogee / broad crested weir | L1,L2 |
| 8 | Determination of efficiency of jet on flat and curved vanes | L1,L2 |
| 9 | Determination of Cd of Venturi flume | L1,L2 |
| 10 | Demo of determination of efficiency of centrifugal pump | L1,L2 |
| 11 | Demo of determination of efficiency of Francis / Kaplan turbine | L1,L2 |
| 12 | Demo of determination of efficiency of Pelton wheel | L1,L2 |

Text Books:

- 1. P. N. Modi and S. M. Seth Hydraulics and Fluid Mechanics, Including Hydraulic Machines, Standard Book House, New Delhi.
- 2. K. Subramanya Fluid Mechanics and Hydraulic Machines, Tata McGraw-Hill, New Delhi.
- 3. R. K. Bansal A Textbook of Fluid Mechanics and Hydraulic Machines, Laxmi Publications, New Delhi.
- 4. Victor L. Streeter, Benjamin Wyile E, and Keith W. Bedford Fluid Mechanics, Tata McGraw-Hill Publishing Co. Ltd, New Delhi.
- 5. J. F. Douglas, M. Gastric, John Warfield, Lynne Jack Fluid Mechanics, Pearson, Fifth Edition.
- 6. K. Subramanya Fluid Mechanics and Hydraulic Machines, Problems and Solutions, Tata McGraw-Hill, New Delhi.
- 7. S. K. Som and G. Biswas Introduction to Fluid Mechanics and Fluid Machines, Tata McGraw-Hill, New Delhi.

CO & PSO –PO Mapping

| | Ma | pping | g of C | ourse | Out | comes | s and | Prog | ram s | specifi | ic outc | omes | to Prog | ram O | utcome | S |
|----------|----|-----------------------------------|--------|-------|-----|-------|-------|------|-------|---------|---------|------|---------|-------|--------|-----|
| G | | Program outcomes Program Specific | | | | | | | | | | | | | | |
| Course | | Outcomes | | | | | | | | | | | | | | |
| outcomes | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PSO | PSO | PSO | PSO |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 |
| CO1 | 2 | 2 | | | | | | | | | | 2 | | | | 2 |
| CO2 | 2 | 2 | 2 | | | | | | | | | 2 | | | | 2 |
| CO3 | 2 | 2 | | | | | | | | | | 2 | | | | 2 |
| CO4 | 2 | 2 | | | | | | | | | | 2 | | | | 2 |
| CO5 | 2 | 2 | | | | | | | | | | 2 | | | | 2 |
| Average | 2 | 2 | 2 | | | | | | | | | 2 | | | | 2 |

Level 0: Not Mapped, 1: Low Mapped, 2: Moderately Mapped 3: Highly Mapped

Total Hours of Pedagogy (Theory): 40 hours Theory + 8-10 Lab slots

Transportation Engineering

Course Type: Theory

Course Learning objectives: This course will enable students to

- Gain knowledge of different modes of transportation systems and to learn the introductory concepts on Highway Engineering.
- Get insight to different highway materials and pavement design elements of a highway network.
- Understand to different aspects of geometric elements of railway system and evaluate the material quantity required for track laying
- Gain knowledge about various components of an Airport and its runway design.

MODULE - I

08 Hrs.

TRANSPORTATION ENGINEERING: Introduction, Different Modes of Transportation, M R Jayakar Committee recommendations, Road Classifications and Road Patterns. Highway Alignment: Factors affecting highway alignment, Engineering surveys for alignment conventional and modern methods.

Highway Geometric Design: Factors affecting geometric design of roads, Cross Sectional Elements, Sight distances, Horizontal alignment- Transition curve, superelevation, Extrawidening, Vertical alignment–gradients, summit and valley curves. *(No derivations)*

Problems on Sight distance, Super elevation, extra widening of curves, Length of transition curve, Length of summit and valley curve.

MODULE - II

08 Hrs.

HIGHWAY MATERIALS AND PAVEMENTS: Desirable properties of aggregates, soil subgrade & Bitumen, Application of bituminous emulsion, Desirable properties of Bituminous **Mixes Pavement Design:** Factors Controlling design of highway pavements, Pavement types, component parts of pavements and their functions; types of joints used in rigid pavement. Critical stresses in flexible and rigid pavement.

Highway Drainage: Significance and requirements, Surface drainage system and design-Examples, sub surface drainage system, Types of cross drainage structures their choice and location.

Problems on design of Longitudinal drain.

MODULE - III

08 Hrs.

TRAFFIC ENGINEERING: Objectives and scope of Traffic Engineering. Traffic Characteristics:

Road user characteristics, vehicular characteristics – static and dynamic characteristics, Reaction time of driver and PIEV theory, Types of traffic engineering studies-volume, spot speed, speed and delay, parking, accident, origin & destination, objectives of studies and data collection, method of study, analysis. PCU concept, factors affecting and PCU at different locations and applications. Traffic signs, Signal design by IRC method; Types of intersections.

Problems on Spot speed studies, Speed and delay studies, accident studies, Signal design by IRC method.

| 08 Hrs. |
|---------|

RAILWAY ENGINEERING: Permanent way and its requirements, Gauges and types, Typical cross

sections single and double-line BG track, Coning of wheels and tilting of rails, Rails-Functions requirements, types and defects of rails. Sleepers and Ballast: Functions, requirements, Track fitting

and fasteners, Calculation of quantity of materials required for laying a track, Points & crossings, Railway Station and Yards. Metro train & high speed train- Design factors considered. *Problem on Quantity calculation for laying railway track. Super-elevation*

MODULE - V

MODULE - IV

08 Hrs.

AIRPORT ENGINEERING: Layout of an airport with component parts and functions, Site selection for airport, Aircraft characteristics affecting the design and planning of airport, Airport classification, Runway orientation using wind rose with examples.

RUNWAY-Basic runway length-Corrections and examples, Runway geometrics, Taxiway-Factors affecting the layout - geometrics of taxiway-Comparison between Runway and Highway, Design of exit taxiway with examples.

Problems on Runway orientation, Basic Runway length, Exit taxiway design.

PRACTICAL COMPONENT OF IPCC

Tests on Aggregates

a. Crushing Strength Test b. Los Angeles abrasion test c. Impact test

d. Shape tests (combined index and angularity number)

Tests on Bituminous Materials

a. Penetration test b. Ductility test c. Softening point test d. Specific gravity test e. Viscosity test by tar viscometer f. Flash and fire point test

Tests on Soil

a. Wet sieve analysis b. CBR Test on soil

Design of flexible pavement as per IRC 37-2018

Design of Rigid pavement as per IRC 58-2015

Bituminous Mix Design by Marshall Method (Demonstration only)

Traffic Engineering studies.

Course Outcomes: Student will be able to

- CO1 Explain the basic principles of geometric design in the context of transportation engineering and planning.
- CO2 Select the appropriate pavement materials for construction and design the pavement as per standard practices.
- CO3 Conduct traffic studies and analyse traffic data for practical applications.
- CO4 Identify the Components parts of Railway Track and design the suitable runway for an Airport.
- CO5 Able to interpret the experimental results of highway materials based on laboratory tests and design the pavement as per IRC guidelines.

| | | С | O and | d PO | Марр | oing | | | | | | |
|-----------------|--------------------|---|-------|------|------|------|---|---|---|----|----|----|
| Course Outcomes | Programme Outcomes | | | | | | | | | | | |
| Course Outcomes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| CO1 | 2 | 2 | 3 | | | | | | | 1 | | 1 |
| CO2 | 2 | 2 | 3 | | | | | | | 1 | | 1 |
| CO3 | 2 | 2 | 3 | | | | | | | 1 | | 1 |
| CO4 | 2 | 2 | 3 | | | | | | | 1 | | 1 |
| CO5 | 2 | 2 | 3 | | | | | | | 1 | | 1 |

Suggested Learning Resources: Books

1. S K Khanna and C E G Justo, "Highway Engineering", Nem Chand Bros, Roorkee.

2. L R Kadiyali, "Highway Engineering", Khanna Publishers, New Delhi.

3. "A Text Book of Railway Engineering" by S C Saxena and S P Arora

4. "Airport Engineering" by S C Rangwala

5. "Airport Planning and Design" by Khanna Arora and Jain, Nem Chand Bros, Roorke.

6. "Roads, Railways, Bridges, Tunnels and Harbour Dock Engineering by B L Gupta, Amit Gupta.

7. S K Khanna, C E G Justo and A Veeraragavan, "Highway Materials Testing Laboratory Manual", Nem Chand Bros, Roorkee.

22UCV413L: BUILDING MATERIAL TESTING LABORATORY

1 Credits (0-0-2)

MAJOR TESTS

- 1. Tension test on mild steel and HYSD bars
- 2. Torsion test on mild steel circular sections.
- 3. Bending test on wood under two-point loading.

MINOR TESTS

- 1. Test on bricks Compressive strength and Absorption
- 2. Flexural test on tiles
- Tests on Fine aggregates Sieve Analysis, Moisture content, Specific gravity, Bulk density, Bulking and Silt Content
- 4. Tests on Coarse aggregates Sieve Analysis, Water absorption, Moisture content, specific gravity and Bulk density
- 5. Shear Test on Mild steel single and double shear.
- 6. Impact test on Mild Steel (Charpy & Izod).
- 7. Hardness tests on ferrous and non-ferrous metals Brinell's, Rockwell and Vicker's.

Course Outcomes

Student will be able to

- 1. Analyze the physical characteristics, and behavior of common building materials.
- 2. Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion for steel
- 3. Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials.
- 4. Recognize the importance of ethical conduct, integrity, and accuracy in materials testing and reporting

Reference Books:

- 1. Davis, Troxell and Hawk, Testing of Engineering Materials, International Student Edition McGraw Hill Book Co. New Delhi.1982
- 2. Fenner, Mechanical Testing of Materials, George Newnes Ltd. London.1965

- 3. Holes K A, English, Experimental Strength of Materials, Universities Press Ltd.London.2010
- 4. Suryanarayana A K, Testing of Metallic Materials, Prentice Hall of India Pvt. Ltd. New Delhi.2007
- 5. Kukreja C B- Kishore K. Ravi Chawla, Material Testing Laboratory Manual, Standard Publishers & Distributors 1996.
- 6. M.L.Gambhir, Concrete Manual, Dhanpat Rai & Sons- New Delhi.2004

Laboratory Assessment

1. Each Laboratory Subject is evaluated for 100 marks (50 CIE and 50 SEE) Allocation of 50 marks for CIE Performance and Journal write-up: Marks for each experiment = 30 marks / No. of proposed experiments. One Practical test for 20 marks (5 write-up, 10 conduction, calculation, results etc., 5 viva-voice).

2. Allocation of 50 marks for SEE 25% write-up, 50% conduction, calculation, results etc 25 % viva-voice.

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| 1 | 3 | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | |
| 2 | 3 | | | 2 | 2 | 3 | 3 | 3 | 3 | 3 | | 3 | 2 | 3 | |
| 3 | 3 | | | | | 3 | 3 | 3 | 3 | 3 | | 3 | 2 | 3 | |
| 4 | 3 | | | | | 3 | 3 | 3 | 3 | 3 | | 3 | 2 | 3 | |
| 22UCV413L | 3 | | | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | |

| Strength of CO | mapping to POs and PS | Os with justification |
|-----------------|-----------------------|-----------------------|
| 1: Slight (Low) | 2: Moderate (Medium) | 3: Substantial (High) |

| Concreting T | Sechniques and Practices | Semester | 4 | | | | | | | | |
|---|--|-----------------------|-----------|--|--|--|--|--|--|--|--|
| Course Code | 22UCV414C | CIE Marks | 50 | | | | | | | | |
| Teaching Hours/Week (L: T:P: S) | 2:2:0:0 | SEE Marks | 50 | | | | | | | | |
| Total Hours of Pedagogy | 40 | Total Marks | 100 | | | | | | | | |
| Credits | 03 | Exam Hours | 3 | | | | | | | | |
| Examination type (SEE) | Theory | | | | | | | | | | |
| Course objectives: | | | | | | | | | | | |
| • To present the basics of concrete and different materials used in it. | | | | | | | | | | | |
| • To impart knowledge on mat | erials used in concrete, relevant Indian st | andard codes, and | 1 | | | | | | | | |
| practical aspects on concretin | ng activities at projects. | | | | | | | | | | |
| • To explain the importance of | making good quality concrete to build d | urable structures. | | | | | | | | | |
| • To introduce the Design of co | oncrete mixes from the Industrial experie | ences at Sites and | | | | | | | | | |
| optimization of higher grades | s of Concrete. | 1 6 1 | | | | | | | | | |
| • To learn the best practices in | concrete construction from industry's de | ecades of experien | ices, | | | | | | | | |
| thumb rules, mitigation of co | ncreting issues at Sites | | | | | | | | | | |
| Teaching-Learning Process (Gene | ral Instructions) | C (1) . | | | | | | | | | |
| These are sample Strategies, which a | teachers can use to accelerate the attainment of | of the various course | 2 | | | | | | | | |
| 1. Blackboard teaching | | | | | | | | | | | |
| 2. Power point Presentation | | | | | | | | | | | |
| 3. Videos, NPTEL materials | | | | | | | | | | | |
| 4. Quiz/Assignments/Open bo | ook test to develop skills. | | | | | | | | | | |
| 5. Adopt problem-based learn | ing (PBL) to develop analytical and thinking sk | cills. | 0.11wa | | | | | | | | |
| Introduction to concrete over | view of meterials compart low corbon a | amont coarse age | 8 HIS | | | | | | | | |
| and fine aggregate and min | eral admixture: fly ash GGBS mice | ro silica / silica | fume | | | | | | | | |
| metakaolin / rice husk ash cou | prosite cement and ultrafine materials | lob test - fineness | of fly | | | | | | | | |
| ash recycled aggregate | inposite cement and uttrainte materials, | iao test - meness | or ny | | | | | | | | |
| | Module-2 | | 8 Hrs | | | | | | | | |
| Water and chemical admixture | e source requirements limits and testing | a Blanding of ago | ragata | | | | | | | | |
| · Planding of fine and approx | agregate gradation for antimization and | g Dictioning of age | ,iegaie | | | | | | | | |
| Diending of fine and coarse a | Madula 2 | i practical aspects. | Ollwa | | | | | | | | |
| Min design Malanastria min | Module-3 | | 8 HFS | | | | | | | | |
| Mix design - volumetric mix | design, mix design by absolute volur | ne method, work | | | | | | | | | |
| practical examples based on in | idustries experience at project sites over | several decades, | nigher | | | | | | | | |
| grades of concrete, high peri | formance concrete, test on concrete: w | orkability of col | ncrete, | | | | | | | | |
| flexural and compressive streng | gth tests. | | | | | | | | | | |
| | Module-4 | | 8 Hrs | | | | | | | | |
| Production of concrete-: batc | hing plant, calibration, mixing and tr | ansportation of c | concrete | | | | | | | | |
| handling of concrete at constr | uction, ready-mix concrete, pumping, | placing of concre | ete with | | | | | | | | |
| boom placers, levelling, vibr | ation and compaction, cold joints, fi | nishing and curi | ing and | | | | | | | | |
| protection of concrete | | | | | | | | | | | |
| | Module-5 | | 8 Hrs | | | | | | | | |
| Special types of concrete: s | elf-compacting concrete, mass concre | ete, dry lean co | oncrete, | | | | | | | | |
| geopolymer concrete, pavemen | t quality concrete, fiber reinforced conc | rete, composite co | oncrete, | | | | | | | | |
| lightweight concrete, ferrocem | ent, shotcreteing, guniting, grouting, c | hallenges faced a | it sites: | | | | | | | | |
| plastic shrinkage cracks, plasti | c settlement, honeycomb, bug holes, c | over to concrete, | do's and | | | | | | | | |
| don'ts in concrete construction, | site shoot, introduction on 3D printing. | | | | | | | | | | |

Course outcome (Course Skill Set)

At the end of the course, the student will be able to:

- 1. Evaluate the properties of concrete by conducting tests on cement, aggregate and concrete (with & without admixtures) for using the data for Mix design procedures
- 2. Understand to Select and proportionate different materials used in a concrete mix including admixtures
- 3. Design a concrete mix as per requirements of construction project
- 4. Apply the best practices in concrete construction from industry's requirement, thumb rules, mitigation of concreting issues at Sites.

Suggested Learning Resources:

Books

- 1. Concrete Technology by M. S. Shetty, S Chand, New Delhi-110055.
- 2. Concrete Technology by M. L. Gambhir, Tata McGraw-Hill.
- 3. IS 456, IS 269, IS 516, IS 1786, IS 1893, IS 12269, IS 9103, IS 8112

Web links and Video Lectures (e-Resources):

• E-learning content on L&T EduTech Platform.

Activity Based Learning (Suggested Activities in Class)/ Practical Based Learning

• Visit to construction site to understand concreting process

| | CO | and | PO N | Mapp | oing | | | | | | | |
|------------------------------------|----|-----|------|------|------|---|---|---|---|----|----|----|
| Course Outcomes Programme Outcomes | | | | | | | | | | | | |
| Course Outcomes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| C01 | 2 | 2 | - | - | - | 2 | - | - | - | - | - | 1 |
| CO2 | 2 | 2 | - | - | - | 2 | - | - | - | - | - | 1 |
| CO3 | 2 | 2 | 3 | 3 | - | 2 | - | 3 | - | - | - | 1 |
| CO4 | 2 | 2 | - | 3 | - | 2 | - | - | - | - | - | 1 |
| Average | 2 | 2 | 3 | 3 | 2 | 2 | - | 3 | - | - | - | 1 |

| Course Title: | GIS with Quantum GIS (Lab) | Semester | 4 |
|-------------------------------------|-------------------------------|-------------|-----|
| Course Code | 22UCV415L | CIE Marks | 50 |
| Teaching Hours/Week (L:T:P:S) | 0:0:2:0 | SEE Marks | 50 |
| Credits | 1 | Total Marks | 100 |
| Examination Type (SEE) | Practical | Exam Hours | 02 |

| Sl. no | Experiments |
|-----------|--|
| 1 | Install and demonstration of open source QGIS software, Demonstration of Working with Vector and raster data sets . Practice Adding shape file and image to the QGIS software |
| 2 | Application of Useful commands for geo-processing – Clip, Buffer, Union, Intersection, spatial selection- Solve 1 sample example for each command |
| 3 | Georeferencing of Survey of India (SOI) topo sheets of 1:50,000 scale (Open series SOI maps can be used) and create point features |
| 4 | Creation of shape file with line features and updations of attribute data, by digitization of topo sheets or satellite image and updations of the attribute data of the shape file and create new shape file. |
| 5 | Installation and use of plugins- Georeferencing SCP,AHP, Coordinate capture – DEMO Only |
| 6 | Creation of shape file with polygon features and updations of attribute data, by digitization of topo sheets or satellite image and updations of the attribute data of the shape file and create new shape file. |
| 7 | Create shape files for LU/LC map of an area |
| 8 | Create shape files for mapping of Urban area –Mapping of buildings, roads, |
| 9 | Create map of different types of roads present in a city or layout, with different colours indicating roads of different types |
| 10 | Convert Raster data to vector data , vector data to raster data, translate JPEG image formats to TIFF image formats |
| 11 | Creation of contour map |

Assessment Details (both CIE and SEE)

CIE Total Marks : 50,

60 % of the total CIE marks is for journal submission (30 MARKS) , 40% of the total CIE marks for CIE test (20 marks). **Passing marks for CIE is 20 marks out of 50 marks**.

SEE Total Marks: 50

SEE passing marks is 25 out of 50 (50 % of total SEE)

Course Outcomes:

CO.1 Application of QGIS for civil engineering infrastructure project planning, traffic management, site investigations in mines and geology etc...

CO.2 Generate new data sets as per new requirements of project, use the new data for estimation purpose, export , share and use data and update data on various electronic platforms.

CO.3 Model the hydraulic components and use the modelled results for analysis of natural phenomena like rainfall, groundwater flow, flood control, flood monitoring etc.... This is needed for planning of water harvesting structures.

CO.4 Use plugins for image classification

CO-PO Mapping Matrix

| Sl. No | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | | | 3 | 3 | | | | | | | | | 2 | 2 | 2 |
| CO2 | | | | 3 | 3 | | | | | | | | 3 | 3 | 3 |
| CO3 | 2 | 2 | | | | | | | | | | | 2 | 2 | 2 |
| CO4 | 2 | 2 | | | 2 | | | | | | | | 2 | 2 | 2 |

References:

1. QGIS user manual-3.16

2. Albert Young, CP.LO, "**Geographical Information Systems**", Prentice Hall publications, 2nd edition, Volume-3, 2005

3. Lilley Sand, Cliffer and Chappmen "Remote Sensing-Fundamentals and Applications", Wieley Publications, 2nd edition-2005

4. Angireddy, "Remote Sensing and GIS", 3rd edition, 2007.

WEB SITES

- 1. WWW.NRSC.GOV.IN/ BHOONIDHI
- 2. WWW.KSRSAC.GOK.NIC.IN
- 3. WWW.GISDEVELOPMENT.NET
- 4. WWW.SLUSI.NIC.IN
- 5 <u>WWW.JSYS.ORG</u>
- 6. WWW.IMD.GOV.IN
- 7. WWW.SOI.GOV.IN

VIDEOS: YOUUBE videos can be referred for every experiment.

| Universal Hum | Semester | IV | | | |
|---|--|-------------|---------|--|--|
| Course Code | 22UHS424C | CIE Marks | 50 | | |
| Teaching Hours/Week (L: T:P: S) | 1:0:0:1 | SEE Marks | 50 | | |
| Total Hours of Pedagogy | 15 hours Theory Session +15 hours Self study | Total Marks | 100 | | |
| Credits | 01 | Exam Hours | 01 Hour | | |
| xamination type (SEE) SEE paper shall be set for 50 questions, each of the 01 mark. The pattern of the question paper is MCQ (multiple choice questions) . | | | | | |

Course objectives:

This course is intended to:

- To help the students appreciate the essential complementarity 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 of 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.
- This course is intended to provide a much-needed orientation input in value education to the young enquiring minds.

Teaching-Learning Process (General Instructions)

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

- **1.** The methodology of this course is explorational and thus universally adaptable. It involves a systematic and rational study of the human being vis-à-vis the rest of existence.
- 2. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the activities will develop students' theoretical and applied skills.
- 3. State the need for UHV activities and its present relevance in the society and Provide real-life examples.
- 4. Support and guide the students for self-study activities.
- 5. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress in real activities in the field.
- 6. This process of self-exploration takes the form of a dialogue between the teacher and the students to begin with, and then to continue within the student in every activity, leading to continuous selfevolution.
- 7. Encourage the students for group work to improve their creative and analytical skills.

| Module - 1 | 3 Hours |
|---------------------------------|---------|
| Introduction to Value Education | |

Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education) Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity – the Basic Human Aspirations, Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations

| Module - 2 | 3 Hours |
|--|------------|
| Harmony in the Human Being : | |
| Understanding Human being as the Co-existence of the Self and the Body, Distir | nguishing |
| between the Needs of the Self and the Body, The Body as an Instrument of | the Self, |
| Understanding Harmony in the Self, Harmony of the Self with the Body, Programme | to ensure |
| self-regulation and Health | |
| Module - 3 | 3 Hours |
| Harmony in the Family and Society : | |
| Harmony in the Family – the Basic Unit of Human Interaction, 'Trust' – the Foundation | al Value |
| in Relationship, 'Respect' – as the Right Evaluation, Other Feelings, Justice in H | uman-to- |
| Human Relationship, Understanding Harmony in the Society, Vision for the Universa | l Human |
| Order | |
| Module - 4 | 3 Hours |
| Harmony in the Nature/Existence : | |
| Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual | Fulfilment |
| among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels | , The |
| Holistic Perception of Harmony in Existence | |
| Module - 5 | 3 Hours |
| Implications of the Holistic Understanding – a Look at Professional Ethics : | |
| Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A | Basis |
| forHumanistic Education, Humanistic Constitution and Universal Human Order, Co | mpetence |
| inProfessional Ethics Holistic Technologies, Production Systems and Management Mod | lels- |
| Typical Case Studies, Strategies for Transition towards Value-based Life and Profession | 1 |
| Course outcome (Course Skill Set) | |
| At the end of the course, students are expected to become more aware of themselves, an | d their |
| surroundings (family, society, nature); | |
| 1. Explore holistic vision of life - themselves and their surroundings. Expected to positiv | ely impact |
| 2. Develop competence and capabilities for maintaining Health and Hygiene. | nahle |
| Solutions. | lubic |
| 4. Apply values to their own self in different day-to-day settings in real life and in handlin | g problems |
| with sustainable solutions. | |
| 5. Adopt the value of appreciation and aspiration for excellence and gratitude for all. | |
| common graduate attributes like: | |
| 1. Ethical human conduct | |
| 2. Socially responsible behaviour | |
| 3. Holistic vision of life | |
| 4. Environmentally responsible work | |
| 5. Having Competence and Capabilities for Maintaining Health and Hygiene 6 Appreciation and aspiration for excellence (merit) and gratitude for all | |
| o. Approximition and aspiration for excentinee (merit) and granuate for an | |
| | |

Suggested Learning Resources:

Books for READING:

Text Book and Teachers Manual

- 1. The Textbook A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
- 2. The Teacher's Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G

Reference Books

- 3. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantak, 1999.
- 4. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
- 5. The Story of Stuff (Book).
- 6. The Story of My Experiments with Truth by Mohandas Karamchand Gandhi
- 7. Small is Beautiful E. F Schumacher.
- 8. Slow is Beautiful Cecile Andrews
- 9. Economy of Permanence J C Kumarappa
- 10. Bharat Mein Angreji Raj Pandit Sunderlal
- 11. Rediscovering India by Dharampal
- 12. Hind Swaraj or Indian Home Rule by Mohandas K. Gandhi
- 13. India Wins Freedom Maulana Abdul Kalam Azad
- 14. Vivekananda Romain Rolland (English)
- 15. Gandhi Romain Rolland (English)
- 16. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
- 17. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth Club of Rome's report, Universe Books.
- 18. A Nagraj, 1998, Jeevan Vidya Ek Parichay, Divya Path Sansthan, Amarkantak.
- 19. P L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
- 20. A N Tripathy, 2003, Human Values, New Age International Publishers.
- 21. SubhasPalekar, 2000, How to practice Natural Farming, Pracheen (Vaidik) KrishiTantraShodh, Amravati.
- 22. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers , Oxford University Press
- 23. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.
- 24. B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books.
- 25. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.

Web links and Video Lectures (e-Resources):

- Value Education websites,
- <u>https://www.uhv.org.in/uhv-ii</u>,
- <u>http://uhv.ac.in</u>,
- <u>http://www.uptu.ac.in</u>
- Story of Stuff,
- <u>http://www.storyofstuff.com</u>
- Al Gore, An Inconvenient Truth, Paramount Classics, USA
- Charlie Chaplin, Modern Times, United Artists, USA
- IIT Delhi, Modern Technology the Untold Story
- Gandhi A., Right Here Right Now, Cyclewala Productions
- https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXEkQw
- <u>https://fdp-si.aicte-india.org/8dayUHV_download.php</u>
- <u>https://www.youtube.com/watch?v=8ovkLRYXIjE</u>
- <u>https://www.youtube.com/watch?v=OgdNx0X923I</u>
- <u>https://www.youtube.com/watch?v=nGRcbRpvGoU</u>
- <u>https://www.youtube.com/watch?v=sDxGXOgYEKM</u>

Course Articulation Matrix: Mapping of Course Outcomes (CO)with Programme Outcomes (PO)and Programme Specific Outcomes (PSO)

| | | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | P O 1 0 | P O 1 1 | P O 1 2 | P S O 1 | P S O 2 | P S O 3 |
|--------|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|------------------|------------------|------------------|------------------|------------------|------------------|
| No | Programme Outcomes Course Outcomes | | | | | | | | | | | | | | | |
| The St | udents will be able to: | | | | | | | | | - | | | | | | |
| 1 | Explore holistic vision of life - themselves and their surroundings. | | | | | | | 3 | 2 | 3 | | | 1 | | | |
| 2 | Develop competence and capabilities for maintaining Health and Hygiene. | | | | | | 3 | 3 | 1 | 1 | | | 1 | | | |
| 3 | Analyse various problems in life, family, Society and in handling problems with Sustainable Solutions. | | | | | | 3 | 3 | 2 | 1 | | | 1 | | | |
| 4 | Apply values to their own self in different day-to-day settings in real life and in handling problems with sustainable solutions. | | | | | | 2 | 2 | 3 | 2 | | | 1 | | | |
| 5 | Adopt the value of appreciation and aspiration for excellence and gratitude for all. | | | | | | | | 3 | | | | 1 | | | |

| Course Code: 22UBT441C | | 03 - C | redits (3 : 0 : 0) | | | | |
|--|---|--|---|--|--|--|--|
| Hours / Week: 03 | | CI | E Marks: 50 | | | | |
| Total Hours: 40 | BIOLOGY FOR ENGINEERS | SE | E Marks: 50 | | | | |
| Exam Hours: 03 | | Tota | al Marks: 100 | | | | |
| Course objectives: | | | | | | | |
| To familiarize the student | ts with the basic biological aspects. | | | | | | |
| To enable the students to | apply biological concepts for enginee | ring applic | cations. | | | | |
| To show the students how | w nature and biological systems inspire | e building s | sustainable | | | | |
| solutions and technologies. | | | | | | | |
| • To motivate the students | to develop the interdisciplinary vision | of biologi | cal engineering. | | | | |
| | Module - 1 | | 08 Hrs. | | | | |
| Introduction to Biology: | | | | | | | |
| The cell: Structure, and f | functions of a cell. Biomolecules: Pr | operties | and functions of | | | | |
| Carbohydrates, Nucleic aci | ds, proteins, lipids. Importance of spe | cial biomo | olecules; Enzymes | | | | |
| -Properties and functions, v | vitamins and hormones. | | | | | | |
| Biomolecules and their Ap | plications: | | | | | | |
| Carbohydrates in cellulose | e-based water filters production, PH | IA and P | LA in bioplastics | | | | |
| production, Nucleic acids i | in vaccines and diagnosis, Proteins in | tood pro | duction, lipids in | | | | |
| biodiesel and detergents r | production, Enzymes in biosensors fa | brication, | food processing, | | | | |
| detergent formulation and textile processing. | | | | | | | |
| detergent formulation and | textile processing. | | | | | | |
| detergent formulation and | Module - 2 | | 08 Hrs. | | | | |
| Bio Inspiration Models Use | Module - 2 ed In Engineering: | | 08 Hrs. | | | | |
| Bio Inspiration - Introduction | Module - 2 ed In Engineering: tion, Alliance between Engineering a | and Biolo | 08 Hrs. | | | | |
| Bio Inspiration Models Use Bio inspiration - Introduct Science mimicking nature. | Module - 2 ed In Engineering: tion, Alliance between Engineering a | and Biolo | 08 Hrs. | | | | |
| Bio Inspiration Models Use Bio inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircl | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr | and Biolo | 08 Hrs. gy, Biomimicry - and self-cleaning | | | | |
| Bio Inspiration Models Use Bio inspiration - Introduct Science mimicking nature. Bird flying (GPS and airco surfaces), Gecko Feet, Pl | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric | and Biolo ophobic a tion redu | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), | | | | |
| Bio Inspiration Models Use Bio inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircu surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. | and Biolo ophobic a ction redu | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), | | | | |
| Bio Inspiration Models Use Bio Inspiration - Introduct Science mimicking nature. Bird flying (GPS and airco surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 | and Biolo ophobic a tion redu | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. | | | | |
| Bio Inspiration Models Use Bio inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircu surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 fals And Mechanisms | and Biolo ophobic a ction redu | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. | | | | |
| Bio Inspiration Models Use Bio Inspiration - Introduct Science mimicking nature. Bird flying (GPS and airco surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi BioEcholocation (ultrasono | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 als And Mechanisms ography, sonars), Photosynthesis (pho | and Biolo ophobic a tion redu | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. cells, bionic leaf), | | | | |
| Bio Inspiration Models Use Bio inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircl surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi BioEcholocation (ultrasono Respiration (MFCs) Human | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 fals And Mechanisms ography, sonars), Photosynthesis (pho- n Blood substitutes-hemoglobin base | and Biolo ophobic a ction redu tovoltaic o d oxygen | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. cells, bionic leaf), carriers (HBOCs) | | | | |
| Bio Inspiration Models Use Bio inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircu surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi BioEcholocation (ultrasono Respiration (MFCs) Humar and perflourocarbons (PFC | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 fals And Mechanisms ography, sonars), Photosynthesis (pho- n Blood substitutes-hemoglobin base Cs). Artificial Intelligence for disease of | and Biolo rophobic a tion redu tovoltaic o d oxygen diagnosis. | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. cells, bionic leaf), carriers (HBOCs) Biochips & their | | | | |
| Bio Inspiration Models Use Bio inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircl surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi BioEcholocation (ultrasono Respiration (MFCs) Humar and perflourocarbons (PFC applications. | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 fals And Mechanisms ography, sonars), Photosynthesis (pho- n Blood substitutes-hemoglobin base Cs). Artificial Intelligence for disease of | and Biolo ophobic a ction redu tovoltaic o d oxygen diagnosis. | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. cells, bionic leaf), carriers (HBOCs) Biochips & their | | | | |
| Bio Inspiration Models Use Bio Inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircu surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi BioEcholocation (ultrasono Respiration (MFCs) Humar and perflourocarbons (PFC applications. Biosensors & their applica | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 fals And Mechanisms ography, sonars), Photosynthesis (pho- n Blood substitutes-hemoglobin base Cs). Artificial Intelligence for disease of ations. Nanobiomolecules in medical | and Biolo rophobic a stion redu tovoltaic o d oxygen diagnosis. science. E | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. cells, bionic leaf), carriers (HBOCs) Biochips & their Biofilms in dental | | | | |
| Bio Inspiration Models Use Bio Inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircl surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi BioEcholocation (ultrasono Respiration (MFCs) Humar and perflourocarbons (PFC applications. Biosensors & their applica treatment | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 fals And Mechanisms ography, sonars), Photosynthesis (pho- n Blood substitutes-hemoglobin base Cs). Artificial Intelligence for disease of ations. Nanobiomolecules in medical | and Biolo ophobic a ction redu tovoltaic o d oxygen diagnosis. science. E | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. cells, bionic leaf), carriers (HBOCs) Biochips & their Biofilms in dental | | | | |
| Bio Inspiration Models Use Bio Inspiration - Introduct Science mimicking nature. Bird flying (GPS and airco surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi BioEcholocation (ultrasono Respiration (MFCs) Humar and perflourocarbons (PFC applications. Biosensors & their applica treatment | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 fals And Mechanisms ography, sonars), Photosynthesis (phor n Blood substitutes-hemoglobin base Cs). Artificial Intelligence for disease of ations. Nanobiomolecules in medical Module - 4 | and Biolo ophobic a ction redu tovoltaic o d oxygen diagnosis. science. E | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. cells, bionic leaf), carriers (HBOCs) Biochips & their Biofilms in dental 08 Hrs. | | | | |
| Bio Inspiration Models Use Bio Inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircu surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi BioEcholocation (ultrasono Respiration (MFCs) Human and perflourocarbons (PFC applications. Biosensors & their applica treatment Human Organ Systems An | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 als And Mechanisms ography, sonars), Photosynthesis (pho n Blood substitutes-hemoglobin base Cs). Artificial Intelligence for disease of ations. Nanobiomolecules in medical Module - 4 ad Bio Designs | and Biolo ophobic a ction redu tovoltaic o d oxygen diagnosis. science. E | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. cells, bionic leaf), carriers (HBOCs) Biochips & their Biofilms in dental 08 Hrs. | | | | |
| Bio Inspiration Models Use Bio Inspiration - Introduct Science mimicking nature. Bird flying (GPS and aircl surfaces), Gecko Feet, Pl Kingfisher beak (Bullet train Nature Bioinspired Materi BioEcholocation (ultrasono Respiration (MFCs) Humar and perflourocarbons (PFC applications. Biosensors & their applicat treatment Human Organ Systems An Brain as a CPU system | Module - 2 ed In Engineering: tion, Alliance between Engineering a rafts), Lotus leaf effect (Super hydr lant burrs (Velcro), Shark skin (Fric n), Fire fly LED. Module - 3 fals And Mechanisms ography, sonars), Photosynthesis (pho- n Blood substitutes-hemoglobin base Cs). Artificial Intelligence for disease of ations. Nanobiomolecules in medical Module - 4 ad Bio Designs (architecture, CNS and Periphera | and Biolo ophobic a ction redu tovoltaic o d oxygen diagnosis. science. E | 08 Hrs. gy, Biomimicry - and self-cleaning ucing swimsuits), 08 Hrs. cells, bionic leaf), carriers (HBOCs) Biochips & their Biofilms in dental 08 Hrs. s System, signal | | | | |

disease).

Heart as a pump system (architecture, electrical signalling - ECG monitoring and heart related issues, reasons for blockages of blood vessels, design of stents, pace makers, defibrillators).

Lungs as purification system gas exchange mechanisms, spirometry, Ventilators, Heart-lung machine).

Eye as a Camera system, bionic eye. Kidney as a filtration system - dialysis systems. Muscular and Skeletal Systems as scaffolds, bioengineering solutions for muscular dystrophy and osteoporosis.

| Module - 5 | 08 Hrs. |
|------------|---------|
|------------|---------|

Trends In Bioengineering

Bioprinting techniques and materials, 3D printing of ear, bone and skin. 3D printed foods, electrical tongue and electrical nose in food science, DNA origami and Biocomputing, Bioimaging and Self-healing Bioconcrete (based on bacillus spores, calcium lactate nutrients and biomineralization processes) and Bioremediation and Biomining via microbial surface adsorption.

Course Outcomes

After completion of the course, students will be able to

1. Elucidate the basic biological concepts required for engineering applications.

2. Evaluate the principles of design and development, for exploring novel bioengineering projects.

3. Behold the bioinspiration from nature and create biomimetics for specific applications.

4. Think critically about exploring innovative biobased solutions for eco-friendly and socially relevant problems.

Web links and Video Lectures (e-Resources)

- https://nptel.ac.in/courses/121106008
- https://freevideolectures.com/course/4877/nptel-biology-engineers-other-non-biologists
- https://ocw.mit.edu/courses/20-020-introduction-to-biological-engineering-designspring-2009
- https://ocw.mit.edu/courses/20-010j-introduction-to-bioengineering-be-010j-spring-2006
- https://www.coursera.org/courses?query=biology
- https://onlinecourses.nptel.ac.in/noc19_ge31/preview
- https://www.classcentral.com/subject/biology
- https://www.futurelearn.com/courses/biology-basic-concepts

Reference Books

1. Biology for Engineers, Rajendra Singh C and Rathnakar Rao N, Rajendra Singh C and Rathnakar Rao N Publishing, Bengaluru, 2023.

2. Biology for Engineers, Thyagarajan S., Selvamurugan N., Rajesh M.P., Nazeer R.A., Thilagaraj W., Barathi S., and Jaganthan M.K., Tata McGraw-Hill, New Delhi, 2012.

3. Biology for Engineers, Arthur T. Johnson, CRC Press, Taylor and Francis, 2011

4. Biomedical Instrumentation, Leslie Cromwell, Prentice Hall 2011.

5. Biology for Engineers, Sohini Singh and Tanu Allen, Vayu Education of India, New Delhi, 2014.

6. Biomimetics: Nature-Based Innovation, Yoseph Bar-Cohen, 1st edition, 2012, CRC Press.

7. Bio-Inspired Artificial Intelligence: Theories, Methods and Technologies, D. Floreano and C. Mattiussi, MIT Press, 2008.

8. Bioremediation of heavy metals: bacterial participation, by C R Sunilkumar, N Geetha A

9. Udayashankar Lambert Academic Publishing, 2019.

10.3D Bioprinting: Fundamentals, Principles and Applications by Ibrahim Ozbolat, Academic Press, 2016.

11. Electronic Noses and Tongues in Food Science, Maria Rodriguez Mende, Academic Press, 2016

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks).

A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

• For the Assignment component of the CIE, there are 25 marks, and for the Internal Assessment Test component, there are 25 marks.

• The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered

• Any two assignment methods mentioned in the 22OB2.4, if an assignment is projectbased then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.

• For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

The Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by the University as per the scheduled timetable, with common question papers for the course (duration 03 hours).

1. The question paper will have ten questions. Each question is set for 20 marks.

2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

3. The students have to answer 5 full questions, selecting one full question from each module.

4. Marks scored shall be proportionally reduced to 50 marks.

| Course | | Programme Outcomes | | | | | | | | | | | Programme Specific | | | |
|----------|---|--------------------|---|---|---|---|---|---|---|----|----|----|--------------------|------|------|--|
| Outcomes | | Outcomes | | | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | PSO1 | PSO2 | PSO3 | |
| CO 1 | 2 | 2 | 1 | | | | 1 | 1 | | | | 2 | 2 | | | |
| CO 2 | 2 | 1 | 2 | | | | 1 | 1 | | | | 3 | 2 | | | |
| CO 3 | 1 | 2 | 1 | | | | 1 | 1 | | | | 2 | 1 | | | |
| CO 4 | 2 | 1 | 2 | | | | 1 | 1 | | | | 3 | 2 | | | |

L:T:P :0:0:2

National Service Scheme

Credit: 00

CIE Marks : 50

(NSS)

Total Hours Per Semester :26

(COMMON TO ALL BRANCHES)

SEE Marks :00

Corse Objectives: National Service Scheme (NSS) will enable the students to:

Course objectives: National Service Scheme (NSS) will enable the students to:

- 1. Understand the community in general in which they work.
- 2. Identify the needs and problems of the community and involve them in problem –solving.
- 3. Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems.
- 4. Develop competence required for group-living and sharing of responsibilities & gain in mobilizing community participation to acquire leadership qualities and democratic attitudes.
- 5. Develop capacity to meet emergencies and natural disasters & practice national integration and social harmony in general.

Contents 26 Hours Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing. 1. 2. Waste management– Public, Private and Govt organization, 5 R's. 3. Setting of the information imparting club for women leading to contribution in social and economic issues. 4. Water conservation techniques – Role of different stakeholders– Implementation. 5. Preparing an actionable business proposal for enhancing the village income and approach for implementation. Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/ 6. vocational education. 7. Developing Sustainable Water management system for rural areas and implementation approaches. 8. Contribution to any national level initiative of Government of India. For eg. Digital India, Skill India, Swachh Bharat, Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc. 9. Spreading public awareness under rural outreach programs.(minimum5 programs). Social connect and responsibilities. 10.

11. Plantation and adoption of plants. Know your plants.

12. Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs).

13. Govt. school Rejuvenation and helping them to achieve good infrastructure.

NOTE:

- Student/s in individual or in a group Should select any one activity in the beginning of each semester till end of that respective semester for successful completion as per the instructions of NSS officer with the consent of HOD of the department.
- At the end of every semester, activity report should be Submitted for evaluation.

Course outcomes (Course Skill Set):

At the end of the course, the student will be able to:

- CO1: Understand the importance of his / her responsibilities towards society.
- CO2: Analyse the environmental and societal problems/issues and will be able to design solutions For the same
- CO3: Evaluate the existing system and to propose practical solutions for the same for sustainable development.
- CO4: Implement government or self-driven projects effectively in the field.
- CO5: Develop capacity to meet emergencies and natural disasters & practice national integration and social harmony in general.

ASSESSMENTANDEVALUATIONPATTERN

| WEIGHTAGE | 100% |
|--|------|
| | CIE |
| At the End of 3 rd Semester | 25 |
| At the End of 4 th Semester | 25 |
| At the End of 5 th Semester | 25 |
| At the End of 6 th Semester | 25 |
| TOTAL MARKS FOR THE COURSE | 100 |

Blown-Up Syllabus

| Distributi | on of Activities - Semester wise from 3 ^{rd.} to 6 th semester | | | | | | |
|------------------|---|--|--|--|--|--|--|
| Semester | Topics / Activities to be Covered | | | | | | |
| 3rd. Semester | Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing. Waste management- Public, Private and Govt organization, 5 R's. Setting of the information imparting club for women leading to contribution in social and economic issues. | | | | | | |
| | 4. Water conservation techniques – Role of different stakeholders– Implementation. | | | | | | |
| 4th | 5. Preparing an actionable business proposal for enhancing the village income and approach for implementation. | | | | | | |
| Semester | 6. Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/ vocational education. | | | | | | |
| | 7. Developing Sustainable Water management system for rural areas and implementation approaches. | | | | | | |
| _ | 8. Contribution to any national level initiative of Government of India. For eg. Digital India, Skill | | | | | | |
| Sth Semester | India, Swachh Bharat, Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc. | | | | | | |
| | 9. Spreading public awareness under rural outreach programs.(minimum5 programs). | | | | | | |
| | 10. Social connect and responsibilities. | | | | | | |
| 64 | 11. Plantation and adoption of plants. Know your plants. | | | | | | |
| Semester | 12. Organize National integration and social harmony events /workshops /Seminars. (Minimum 02 programs). | | | | | | |
| | 13. Govt. school Rejuvenation and helping them to achieve good infrastructure. | | | | | | |

| SI No | Торіс | Group size | Location | Activity execution | Reporting | Evaluation Of the Topic |
|----------|---|---------------------------------|---|---|--|---|
| 1. | Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing. | May be individual or team | Farmers land/Villages / roadside/ community area/ College campus etc | Site selection /Proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 2. | Waste management– Public, Private and Govt organization, 5 R's. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Site selection /proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 3. | Setting of the information imparting club for women leading to contribution in social and economic issues. | May be individual or team | Women empowerment groups/ Consulting NGOs & Govt Teams / College campus etc. | Group selection/proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 4. | Water conservation techniques – Role of different stakeholders– Implementation. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | site selection / proper consultation/ Continuous monitoring/ Information board. | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |

| 5. | Preparing an actionable business proposal for enhancing the village income and approach for implementation. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Group selection/proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
|----|---|---------------------------------|--|---|--|---|
|----|---|---------------------------------|--|---|--|---|
| 6. | HelpinglocalschoolstoachievegoodresultsandenhancetheirenrolmentinHigher/ technical/vocational | May be individual or team | Local government / private/ aided schools/Govern- ment Schemes officers/ etc | School selection/proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
|----|---|---------------------------------|--|--|--|---|
| | education. | | | | | |
| 7. | Developing Sustainable Water management system for rural areas and implementation approaches. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | site selection/proper consultation/ Continuous monitoring/ Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 8. | Contribution to any national level initiative of Government of India. For eg. Digital India, Skill India, Swachh Bharat, Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Group selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 9. | Spreading public awareness under rural outreach programs. (minimum 5 programs). Social connect and responsibilities. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Group selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |

| 10. | Plantation and adoption of plants. Know your plants. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Place selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
|-----|---|---------------------------------|--|--|--|---|
| 11. | Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs). | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Place selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |
| 12. | Govt. school Rejuvenation and helping them to achieve good infrastructure. | May be individual or team | Villages/ City Areas / Grama panchayat/ public associations/ Government Schemes officers/ campus etc | Place selection/proper consultation/ Continuous monitoring / Information board | Report should be submitted by individual to the concerned evaluation authority | Evaluation as per the rubrics of scheme and syllabus by NSS officer |

| Sl. NO | Practice Session Description | | | |
|--------|--|--|--|--|
| 1 | Lecture session by NSS Officer | | | |
| 2 | Students Presentation on Topics | | | |
| 3 | Presentation - 1, Selection of topic, PHASE - 1 | | | |
| 4 | Commencement of activity and its progress - PHASE - 2 | | | |
| 5 | Execution of Activity | | | |
| 6 | Execution of Activity | | | |
| 7 | Execution of Activity | | | |
| 8 | Execution of Activity | | | |
| 9 | Execution of Activity | | | |
| 10 | Case study based Assessment, Individual performance | | | |
| 11 | Sector wise study and its consolidation | | | |
| 12 | Video based seminar for 10 minutes by each student at the end of semester with | | | |
| | Report. | | | |

Pedagogy – Guidelines, it may differ depending on local resources available for the study as well as environment and climatic differences as well as location time of execution.

Plan of Action (Execution of Activities For Each Semester)

| 22UHS001M | | | Credit : 00 | | |
|--------------|--|--|----------------------------|--|--|
| L:T:P :0:0:2 | | YOGA | CIE Marks : 50 | | |
| Total Hour | rs Per Semester :26 | (COMMON TO ALL BRANCHES) | SEE Marks : 00 | | |
| Semester | | Course | | | |
| III Sem | Introduction of Brief introduction Rules and regularity Rules and regularity Misconceptions Suryanamaskara Different types a. Sitting b. Standing c. Proneline d. Supineline | Yoga, Aim and Objectives o on of yogic practices for com ations of yoga a of Asanas | f yoga, Prayer nmon man | | |
| IV Sem | Patanjali's Ash Suryanamaskar Different types a. Sitting b. Standing c. Proneline d. Supineline 4) Pranayama 5) Kapalbhati | tanga Yoga a of Asanas Sitting | | | |
| V Sem | Patanjali's Ash Suryanamaskar Different types a. Sitting b. Standing c. Proneline d. Supineline 4) Kapalbhati 5) Pranayama 1) Patanjali's Ash 2) Suryanamaskar 3) Different types | tanga Yoga a of Asanas tanga Yoga a of Asanas | | | |
| VI Sem | a. Sitting b. Standing c. Proneline d. Supineline 4) Kapalbhati 5) Pranayama 6) ShatKriyas | | | | |

Blown-Up Syllabus

| Semester | Title | Content | No. of Hours | | |
|------------------------------|---|---|-------------------------|--|--|
| | Introduction of Yoga, Aim and Objectives of yoga, Prayer | Yoga, its origin, history and development. Yoga, its meaning, definitions. Different schools of yoga, importance of prayer | | | |
| | Brief introduction of yogic practices for common man | Yogic practices for common man to promote Positive health | | | |
| | Rules and regulations | Rules to be followed during yogic practices by practitioner | Total 26hrs | | |
| 3 ^{rd.} Semester | Misconceptions of yoga | Yoga its misconceptions, Difference between yogic and non yogic practices | 2hrs/week | | |
| beinester | Suryanamaskara | Suryanamaskara prayer and its meaning, Need, Importance and benefits of Suryanamaskara 12 count, 2 rounds | | | |
| | Different types of Asanas a. Sitting 1.Padmasana 2.Vajrasana b. Standing 1.Vrikshana 2.Trikonasana c. Proneline 1.Bhujangasana 2.Shalabhasana d. Supineline 1.Utthitadvipadasana 2. Ardhahalasana | Asana, Need, Importance of Asana. Different types of asanas. Asana its meaning by name, technique precautionary measures and benefits of each asana | | | |
| th | Patanjali's Ashtanga Yoga 1. Yama 2. Niyama | Patanjali's Ashtanga Yoga its need and importance. Yama: Ahimsa, satya, asteya, brahmacarya, aparigraha Niyama: shoucha, santosh, tapa, svaadhyaya, Eshvarapranidhan | | | |
| 4 Semester | Suryanamaskara Different types of Asanas a. Sitting1.Sukhasana 2. Paschimottanasana b. Standing1.ArdhakatiChakrasana 2. ParshvaChakrasana | Suryanamaskar 12 count 4 rounds Asana, Need, importance of Asana. Different types of asanas. Asana its meaning by name, technique, precautionary measures and benefits of each asana | Total 26hrs 2hr/Week | | |
| | d. Supineline 1.Halasana 2.KarnaPeedasana | ana edasana | | | |
| | Kapalabhati | Meaning, importance and benefits of Kapalabhati. 40strokes/min 3rounds | | | |
| | Pranayama–1. 1. Suryanuloma –Viloma 2. Chandranuloma-Viloma 3. Suryabhedana 4. ChandraBhedana 5. Nadishodhana | Meaning, Need, importance of Pranayama. Different types. Meaning byname, technique, precautionary measures and benefits of each Pranayama | | | |

| | Ashtanga Yoga | Patanjali's Ashtanga Yoga its need | |
|-----------------|--|--|-------------|
| | 3.Asana | and importance. | |
| | 4.Pranayama 5. Protychoro | 1 | |
| | 6.Dharana | | |
| | Suryanamaskara | Suryanamaskara 12count 6rounds | - |
| 5 th | Different types of Asanas | Asana, Need, importance of Asana. | |
| 5 Somoston | a. Sitting 1. ArdhaUshtrasana | Different types. Asana its meaning | Total |
| Semester | 2.Vakrasana | by name, technique, precautionary | 26hrs |
| | b. Standing 1.UrdhvaHastothanasana 2.Hastapadasana c. Proneline 1.Padangushtha 2. Dhanurasana | measures and benefits of each asana | 2hrs/week |
| | d. Supineline 1.Sarvangasana 2.Chakraasana | | |
| | Kapalabhati | Revision of practice 50strokes/min 3rounds | |
| | Pranayama–1.SuryaBhedana | Meaning, Need, importance of | |
| | 2.Ujjayi | Pranayama. Different types. | |
| | | Meaning by name, technique, | |
| | | Precautionary measures and | |
| | | benefits of each Pranayama | |
| | Ashtanga Yoga | Patanjali's Ashtanga Yoga its | |
| | 7.Dhyana(Meditation) 8 Samadhi | need and importance. | |
| | Survanamaskara | Revision of practice 12 count | - |
| | Surgananashara | 8 rounds | |
| 6 th | Different types of Asanas | Asana, Need importance of | |
| Semester | a. Sitting1. AakarnaDhanurasana | Asana by name, technique, | |
| | 2. I Ogaliluurann auniasana b. Standing, 1 Parivritta | precautionary erasures and | |
| | 0. Standing 1.1 arvinua 2 Trikonasana | benefits of each asana. | Total 26hrs |
| | 2. Hikohasaha 3. Utkatasana | | 2hrs/ week |
| | 5. Utkatasalla Propeline 1 Poorna Bhujangasana | | |
| | /Rajakapotasana | | |
| | d. Supineline1.Navasana/Noukasana | | |
| | 2.Pavanamuktasana | | |
| | Kapalabhati | Revision of practice 60 strokes/min 3rounds | _ |
| | Pranayama– 1.Sheetali 2 Sheektari | Meaning, Need, importance of | |
| | 3. Bhastrika | Pranayama. Different types. | |
| | 4. Bhramari | Meaning by name, technique, | |
| | | precautionary | |
| | | Pranavama | |
| | ShatKriyas | Meaning Need importance of | 1 |
| | 1. Jalaneti & sutraneti | ShatKrivas, Different types. Meaning | |
| | 2. Nouli(onlyformen) | by name, technique, precautionary | |
| | 3 Sheet karma Kapalabhati | measures and benefits of each Kriva. | |
| | | , see the second s | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Book for Reference:

1. Swami Kuvulyananda :Asma(Kavalyadhama,Lonavala) :Asana Why and How 2. Tiwari, OP 3. Ajitkumar : Yoga Pravesha(Kannada) 4. Swami Satyananda Saraswati :Asana Pranayama, Mudra, Bandha (Bihar School of yoga, Munger) 5. Swami Satyananda Saraswati :SuryaNamaskar (Bihar School of yoga, Munger) 6. Nagendra HR :Theart and science of Pranayama 7. Tiruka :Shatkriyegalu(Kannada) :YogaPradipika(Kannada) 8. Iyengar BKS 9. Iyengar BKS :Light on Yoga(English) : Samagra Yoga Darshini(Kannada) 10. S.K. Kuppasta

Scheme of Assessment:

| WEIGHTAGE | 100% |
|--|------|
| | CIE |
| At the End of 3 rd Semester | 25 |
| At the End of 4 th Semester | 25 |
| At the End of 5 th Semester | 25 |
| At the End of 6 th Semester | 25 |
| TOTALMARKS FOR THECOURSE | 100 |

Note: 1. No Semester End Examinations.

| | Semester:III | | | | | | |
|----------------------------|--|--|--|--|--|--|--|
| | PHYSICAL EDUCATION AND SPORTS | | | | | | |
| Course | Code | : | 22UHS003M | | CIE | : | 100 marks |
| Credits | :L:T:P | : | 0:0:2 | | | | |
| Total H | lours | : | 24P | | | | |
| 1. 2. 3. 5. 6. | Understa Nutrition Familiari developn Createa f Participa Create co developin Understa | nd t and zati nem our te in onsc ng a nd a | the fundamental of d Fitness ion of health - rel t adation for the pro- n the competition ciousness among and maintaining a and practice of Th | concepts and skil ated Exercises, S ofessional sin Ph at regional/state the students on F healthy lifestyle raditional Games | l s of Phys Sports for o ysical Educ /national/ir lealth, Fitn | sical Edu verall gro cation and nternation ess and V | cation, Health, owth and d Sports 4. nal levels. Vellness in |
| Module A. B. | ModuleI:Orientation 4Hours A. Lifestyle B. Health&Wellness | | | | | | |
| C. | Pre-Fitne | sste | est. | | | | |
| Module A. B. C. | ModuleII:GeneralFitness&ComponentsofFitness4HoursA. Warmingup(FreeHandexercises)B. Strength–Push-up/Pull-upsC. Speed–30MtrDash | | | | | | |
| Module | II:Specifi | cga | mes(Anyonetol | peselectedbyth | estudent] |) | 16Hours |
| | 1. Kaba 2. Kho- | ddi Kho | –Handtouch,Toe –GivingKho, Sir | Fouch, ThighHol ngle Chain, Pole | d, Ankle ho dive, Poleti | old and B urning, 3- | onus. -6Up. |

Scheme and Assessment for auditingthecourseandGrades:

| Sl.No. | Activity | Marks |
|--------|---|-------|
| 1. | Participation of student in all the modules | 20 |
| 2. | Quizzes–2, each of 15 marks | 30 |
| 3. | Final presentation / exhibition / Participation in competitions/ practical on specific tasks assigned to the students | 50 |
| | Total | 100 |

| | Semester:IV | | | | | | | | |
|----------------|---|-------|---------------------|---------------|-------------|---|----------|--------|--|
| | PHYSICALEDUCATION(SPORTS&ATHLETICS)-II | | | | | | | | |
| Course | Code | : | BPEK459 | | CIE | : | 100Marks | | |
| Credits:L:T:P | | : | 0:0:2 | | | | | | |
| TotalH | ours | : | 24P | | | | | | |
| Cours | eOutcom | nes:/ | Attheendofthecourse | e,thestudentw | illbeableto | | | | |
| 1. 2. 3. | Understand thee thics and moral values in sports and athletics Perform in the selected sports or athletics of student's choice. Understand the roles and responsibilities of organisation and administration of sports and games. | | | | | | | | |
| Module | eI: Ethics | sand | MoralValues | | | | | 4Hours | |
| A. | Ethics in | n Spo | orts | | | | | | |
| В. | Moral V | alue | s in Sports andGam | ies | | | | | |
| Modulel | ModuleII: Specific Games(Anyone to be selected by the student) 16Hours | | | | | | | | |
| А. В. | A. Volleyball–Attack, Block, Service, Upper Hand Pass and Lower hand Pass.B. Athletics(TrackEvents)–Any event as per availability of Ground. | | | | | | | | |
| Modulel | IoduleIII: Role of Organisation and administration 4Hours | | | | | | | | |

Scheme and Assessment for auditing the course and Grades:

| Sl.No. | Activity | Marks |
|--------|---|-------|
| 1. | Participation of student in all the modules | 20 |
| 2. | Quizzes–2, each of 15marks | 30 |
| 3. | Final presentation / exhibition / Participation in competitions/ practical on specific tasks assigned to the students | 50 |
| | Total | 100 |

| Semester:V | | | | | | |
|--|---|---------|--|-----|---|----------|
| PHYSICAL EDUCATION(SPORTS&ATHLETICS)-I | | | | | | |
| CourseCode | : | BPEK559 | | CIE | : | 100Marks |
| Credits:L:T:P | : | 0:0:2 | | | | |
| TotalHours | : | 24P | | | | |

CourseOutcomes: At the end of the course, the student will be able to

- 1. Understand the fundamental concepts and skills of Physical Education, Health, Food, Nutrition and general fitness.
- 2. Familiarization of health-related Exercises, Sports for overall growth and development
- 3. Createa foundation for the professionals in Physical Education and Sports
- 4. Participate in the competition at regional/state/national/international levels.
- 5. Understand and practice of specific games and athletic throwing events.

Module I: Orientation

4Hours

- A. Fitness
- B. Food&Nutrition

| Sl.No. | Activity | Marks | |
|--------|---|-------|--|
| 1. | Participation of student in all the modules 20 | | |
| 2. | Quizzes–2, each of 15 marks | 30 | |
| 3. | Final presentation/exhibition/Participation in competitions/ practical on specific tasks assigned to the students | 50 | |
| | Total | 100 | |

Module II: General Fitness&Components of Fitness

- A. Agility-ShuttleRun
- B. Flexibility-SitandReach
- C. Cardiovascular Endurance-HarvardstepTest

Module III: Specificgames (Anyone to be selected by the student)

16Hours

- 1. Badminton(Forehandlow/highservice, backh and service, smash, drop)
- 2. Basketball(Dribbling, passing, shooting etc.)
- 3. Athletics(Fieldevents–Throws)

Scheme and Assessment for auditing the course and Grades:

| Semester:VI | | | | | | | | |
|---|---|---------|--|-----|---|----------|--|--|
| PHYSICAL EDUCATION(SPORTS&ATHLETICS)-II | | | | | | | | |
| CourseCode | : | BPEK659 | | CIE | : | 100Marks | | |
| Credits:L:T:P | : | 0:0:2 | | | | | | |
| TotalHours | : | 24P | | | | | | |
| Course Out comes : At the end of the course, the student will be able to | | | | | | | | |
| 1. Understand thePostural deformities and Stress management in sports and athletics 2. Participate in the competition at regional/state/national/international levels. 3. Understand and practice of specific games and athletic Jumping events. 4. Understand and practice of Aerobics. ModuleIV: Orientation 4Hours 1. Postural deformities. 2. Stress management ModuleV: Specific Games(Any one to be selected by the student) 1. Throwball | | | | | | | | |
| 2. Table Tennis | | | | | | | | |
| 3. Athletics(FieldEvents-Jumps)–Any event as per availability of Ground. | | | | | | | | |
| ModuleVI: Aerobics 4Hours | | | | | | | | |

Scheme and Assessment for auditing the course and Grades:

| Sl.No. | Activity | Marks |
|--------|---|-------|
| 1. | Participation of student in all the modules | 20 |
| 2. | Quizzes–2, each of 15 marks | 30 |
| 3. | Final presentation / exhibition / Participation in competitions/ practical on specific tasks assigned to the students | 50 |
| | Total | 100 |