DEPARTMENT OF CIVIL ENGINEERING

2022 REGULATION

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The civil Engineering Program Educational Objectives are to prepare the young graduates to

PEO1	Acquire engineering knowledge to develop solutions for technical problems through investigation and analysis.
PEO2	Gain the ability to use modern tools effectively in support of society and to achieve environmental sustainability.
PEO3	Work independently and collaboratively exhibiting professional and ethical responsibilities.
PEO4	Manage teams, resources and improve continuously in the professional career.

Programme Outcomes(POs)

Engineering Graduates will be able to:

PO1	**Engineering Knowledge:** Apply the knowledge of mathematics, science and civil engineering fundamentals.
PO2	**Problem Analysis:** Identify, formulate, and analyze civil engineering problems.
PO3	**Design/Development of Solutions:** : Design and develop the system to meet specific needs of society with environmental considerations.

PO4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods to investigate complex problems.
PO5	**Modern tool usage:** Use appropriate modern tools such as CIM, CFD, CAE, Lean 6-sigma etc., to identify, analyze and solve problems.
PO6	**The engineer and society**: Apply engineering knowledge to assess and solve issues concerning society.
PO7	**Environment and sustainability:** Evaluate the impact of engineering solutions on the environment and ensure its sustainability.
PO8	**Ethics:** Apply professional ethics pertaining to engineering practice
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in multidisciplinary teams.
PO10	**Communication:** Communicate engineering activities effectively to the engineering community and society.
PO11	**Project management and finance**: Demonstrate principles/practices of management and finance in one's own work, as a member and leader in a team, to manage projects in an organization.

PO12	**Life-long learning:** Recognize the need, and prepare for independent and life-long learning process.

Programme Specific Outcomes (PSOs)

PSO1	Demonstrate engineering knowledge in the various core streams of civil engineering, namely, thermal engineering, design engineering, manufacturing engineering, material science, and industrial management.
PSO2	Identify the root cause of a problem and solve it by applying modern tools such as CIM, CFD, and CAE using research based approach and innovation.
PSO3	Function competently as an individual or in teams, demonstrating extraordinary communication skills and leadership qualities with social and ethical commitment

LIST OF COURSES

REGULATION 2022

SI.NO	SUB.CODE	SUB.NAME
1	BMATS101	ENGINEERING MATHEMATICS FOR CSE STREAM-I
2	BCHES102	CHEMISTRY FOR CSE
3	BCEDK103	COMPUTER AIDED ENGINEERING DRAWING
4	BESCK104B	INTRODUCTION TO ELECTRICAL ENGINEERING
5	BPLCK105B	INTRODUCTION TO PYTHON PROGRAMMING
6	BENGK106	COMMUNICATIVE ENGLISH
7	BKSKK107/BKBKK107	SAMSKRUTHIKA KANNADA/BALAKE KANNADA
8	BSFHK158	SCIENTIFIC FOUNDATION FOR HEALTH
9	BMATS201	ENGINEERING MATHEMATICS FOR CSE STREAM-II
10	BPHYS202	PHYSICS FOR CSE
11	BPOPS203	PRINCIPLES OF PROGRAMMING USING C
12	BESCK204C	INTRODUCTION TO ELECTRONICS COMMUNICATION
13	BETCK205J	INTRODUCTION TO EMBEDDED SYSTEM
14	BPWSK206	PROFESSIONAL WRITING SKILLS IN ENGLISH
15	BICOK207	INDIAN CONSTITUTION
16	BIDTK258	INNOVATION AND DESIGN THINKING (IDT)
17	BCV301	STRENGTH OF MATERIALS
18	BCV302	ENGINEERING SURVEY
19	BCV303	ENGINEERING GEOLOGY

20	BCV304	WATER SUPPLY & WASTE WATER ENGINEERING
21	BCV305	AIDED BUILDING PLANNING & DRAWING COMPUTER
22	BCV306D	FIRE SAFETY IN BUILDINGS
23	BSCK307	SOCIAL CONNECT & RESPONSIBILITY
24	BCVL358C	PROBLEM SOLVING WITH PYTHON
25	BCV401	ANALYSIS OF STRUCTURES
26	BCV402	FLUID MECHANICS AND HYDRAULICS
27	BCV403	TRANSPORTATION ENGINEERING
28	BCV404	BUILDING MATERIAL TESTING LABORATORY
29	BCV405D	WATERSHED MANAGEMENT
30	BCV456B	GIS WITH QUANTUM GIS
31	BBOK407	BIOLOGY FOR ENGINEERS
32	BUHK40	UNIVERSAL HUMAN VALUE COURSE

COURSE OUTCOME FOR CIVIL ENGINEERING

DEGREE	**U.G**
PROGRAMME	**B.E -CIVIL ENGINEERING**
ACADEMIC YEAR	**2021-22**
REGULATION	**2022**

FIRST SEMESTER	
1.Course Code and Name : BMATS101 ENGINEERING MATHEMATICS FOR CSESTREAM-I	
CO Statements	
At the end of the course, learners will be able	
CO1	apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate
CO2	analyze the solution of linear and nonlinear ordinary differential equation
CO3	get acquainted and to apply modular arithmetic to computer algorithms
CO4	make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
CO5	familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB
2.Course Code and Name : BCHES102 CHEMISTRY FOR CSE	
CO Statements	
At the end of the course, learners will be able	
CO1	Identify the terms processes involved in scientific and engineering and applications
CO2	Explain the phenomena of chemistry to describe the methods of engineering processes
CO3	Solve the problems in chemistry that are pertinent in engineering applications
CO4	Apply the basic concepts of chemistry to explain the chemical properties and processes
CO5	Analyze properties and multidisciplinary situations processes associated with chemical substances in engineering

3.Course Code and Name: BCEDK103 COMPUTER AIDED ENGINEERING DRAWING	
CO Statements	
At the end of the course, learners will be able	
CO1	Draw and communicate the objects with definite shape and dimensions
CO2	Recognize and Draw the shape and size of objects through different views
CO3	Develop the lateral surfaces of the object
CO4	Create a Drawing views using CAD software
CO5	Identify the interdisciplinary engineering components or systems through its graphical representation.
4.Course Code and Name: BESCK104B INTRODUCTION TO ELECTRICAL ENGINEERING	
CO Statements	
At the end of the course, learners will be able	
CO1	Understand the concepts of various energy sources and Electric circuits.
CO2	Apply the basic Electrical laws to solve circuits
CO3	Discuss the construction and operation of various Electrical Machines.
CO4	Identify suitable Electrical machine for practical implementation.
CO5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.
5.Course Code and Name: BPLCK105B INTRODUCTION TO PYTHON PROGRAMMING	
CO Statements	
At the end of the course, learners will be able	
CO1	Demonstrate proficiency in handling loops and creation of functions
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries
CO3	Develop programs for string processing and file organization
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
6.Course Code and Name: BENGK106 COMMUNICATIVE ENGLISH	
CO Statements	
At the end of the course, learners will be able	
CO1	Understand and apply the Fundamentals of Communication Skills in their communication skills.
CO2	Identify the nuances of phonetics, intonation and enhance pronunciation skills.
CO3	To impart basic English grammar and essentials of language skills as per present requirement.

CO4	Understand and use all types of English vocabulary and language proficiency
CO5	Adopt the Techniques of Information Transfer through presentation
7.Course Code and Name: BKSKK107/BKBKK107 SAMSKRUTHIKA KANNADA/BALAKE KANNADA	
CO Statements	
At the end of the course, learners will be able	
CO1	To Create the awareness regarding the necessity of learning local language for comfortable and healthy life.
CO2	To enable learners to Listen and understand the Kannada language properly.
CO3	To speak, read and write Kannada language as per requirement.
CO4	To train the learners for correct and polite conservation
CO5	To know about Karnataka state and its language, literature and General information about this state.
8.Course Code and Name: BSFHK158 SCIENTIFIC FOUNDATION FOR HEALTH	
CO Statements	
At the end of the course, learners will be able	
CO1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset.
CO2	Develop the healthy lifestyles for good health for their better future.
CO3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life
CO4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future.
CO5	Prevent and fight against harmful diseases for good health through positive mindset.
SECOND SEMESTER	
11.Course Code and Name: BMATC201 ENGINEERING MATHEMATICS FOR CIV STREAM-II	
CO Statements	
At the end of the course, learners will be able	
CO1	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume.
CO2	Understand the applications of vector calculus refer to solenoidal, and irrotational vectors. Orthogonal curvilinear coordinates
CO3	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
CO4	Apply the knowledge of numerical methods in analyzing the discrete data and solving the physical and engineering problems.
CO5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB
12.Course Code and Name: BPHYS202 PHYSICS FOR CSE	
CO Statements	
At the end of the course, learners will be able	

CO1	Describe the principles of LASERS and Optical fibers and their relevant applications.
CO2	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.
CO3	Summarize the essential properties of superconductors and its applications in qubits.
CO4	Illustrate the application of physics in design and data analysis.
CO5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.
13.Course Code and Name: BPOPS203 PRINCIPLES OF PROGRAMMING USING C	
CO Statements	
At the end of the course, learners will be able	
CO1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.
CO2	Apply programming constructs of C language to solve the real world problem
CO3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
CO4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
CO5	Design and Develop Solutions to problems using modular programming constructs using functions
14.Course Code and Name: BESCK204C INTRODUCTION TO ELECTRONICS COMMUNICATION	
CO Statements	
At the end of the course, learners will be able	
CO1	Prepare students with fundamental knowledge/ overview in the field of Electronics and Communication Engineering.
CO2	Equip students with a basic foundation in electronic engineering required for comprehending the operation and application of electronic circuits, logic design, embedded systems, and communication systems.
CO3	Professionalism & Learning Environment: To inculcate in first-year engineering students an ethical and professional attitude by providing an academic environment inclusive of effective communication, teamwork, ability to relate engineering issues to a broader social context, and life-long learning needed for a successful professional career.
15.Course Code and Name: BETCK205J INTRODUCTION TO EMBEDDED SYSTEM	
CO Statements	
At the end of the course, learners will be able	
CO1	Explain characteristics of Embedded System design
CO2	Acquire knowledge about basic concepts of circuit emulators, debugging and RTOS
CO3	Analyse embedded system software and hardware requirements
CO4	Develop programming skills in embedded systems for various applications.
CO5	Design basic embedded system for real time applications

16.Course Code and Name: BPWSK206 PROFESSIONAL WRITING SKILLS IN ENGLISH	
CO Statements	
At the end of the course, learners will be able	
CO1	To understand and identify the Common Errors in Writing and Speaking.
CO2	To Achieve better Technical writing and Presentation skills.
CO3	To read Technical proposals properly and make them to Write good technical reports
CO4	Acquire Employment and Workplace communication skills
CO5	To learn about Techniques of Information Transfer through presentation in different level

17.Course Code and Name: BICOK207 INDIAN CONSTITUTION	
CO Statements	
At the end of the course, learners will be able	
CO1	Analyse the basic structure of Indian Constitution
CO2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
CO3	Know about our Union Government, political structure & codes, procedures.
CO4	Understand our State Executive & Elections system of India
CO5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

3.Course Code and Name: BIDTK258 INNOVATION AND DESIGN THINKING (IDT)	
CO Statements	
At the end of the course, learners will be able	
CO1	Appreciate various design process procedure
CO2	Generate and develop design ideas through different technique
CO3	Identify the significance of reverse Engineering to Understand products
CO4	Draw technical drawing for design ideas

THIRD SEMESTER	
1.Course Code and Name : BCV301 Strength of materials	
CO Statements	
At the end of the course, learners will be able	
CO1	Appraise the basic concepts of stresses and strains for different materials and strength of structural elements.
CO2	Determine the bending moment and shear forces induced due to loads on structural elements and schematic representation of the same.
CO3	Evaluate the behavior of bending, shear stresses and torsion in beams and suggest most economical section.
CO4	Analyse the stresses in Thin and Thick cylinders and Compound Stresses
CO5	Estimate the behavior of columns and struts and evaluate the slope and deflections of beams.

2.Course Code and Name : BCV302 Engineering survey	
CO Statements	
At the end of the course, learners will be able	
CO1	Summarize various types of surveying and carry out distance measurement using various equipment.
CO2	Illustrate the use and applications of levelling and theodolite.
CO3	Plot contours, longitudinal and cross sections for construction projects.
CO4	Set curves for construction works and carry out estimation of areas and volumes.
CO5	Demonstrate the necessary skills to carry out GPS and DRONE Surveying.

3.Course Code and Name BCV303 Engineering geology	
At the end of the course, learners will be able	
CO1	Apply geological knowledge in different civil engineering practice.
CO2	Acquire knowledge on durability and competence of foundation rocks, and will be able to use the best building materials.
CO3	Students will become competent enough for the safety, stability, economy and life of the structures that they construct
CO4	Able to solve various issues related to ground water exploration, build updams, bridges, tunnels which are often confronted with ground water problems
CO5	Students will become Intelligent enough to apply GIS, GPS and remote sensing as a latest tool in different civil engineering for safe and solid construction.
4.Course Code and Name : BCV304 Water supply & waste water engineering	
CO Statements	
At the end of the course, learners will be able	
CO1	Estimate the average and peak water demand for a community.
CO2	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
CO3	Design the different units of water treatment plant.
CO4	Design the various units of wastewater treatment plant.
CO5	Design of various AOPs and low cost treatment units.
5. Course Code and Name : BCV305 aided building planning & drawing Computer	
CO Statements	
At the end of the course, learners will be able	
CO1	Prepare, read and interpret the drawings in a professional set up
CO2	Know the procedures of submission of drawings.
CO3	Develop working and submission drawings for building.
CO4	Plan of residential building as per the given requirements.
CO5	Plan of public building as per the given requirements.
6.Course Code and Name : BCV306D Fire safety in buildings	
CO Statements	
At the end of the course, learners will be able	
CO1	Understand types of fire, combustion process and fire resistance
CO2	Plan for fire safety and design of lifts
CO3	Design flow network in buildings
CO4	Design of electrical systems and maintenance
CO5	Perform health evaluation of buildings and suggest remedies

7.Course Code and Name: BSCK307 Social connect & responsibility	
CO Statements	
At the end of the course, learners will be able	
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 community participation to acquire leadership qualities and democratic attitudes.
8.Course Code and Name : BCVL358C Problem solving with python	
CO Statements	
At the end of the course, learners will be able	
CO1	Understand Python syntax and semantics and be fluent in the use of Python flow control and functions.
CO2	Demonstrate proficiency in handling Strings and File Systems.
CO3	Represent compound data using Python lists, tuples, strings, and dictionaries.
CO4	Read and write data from/to files in Python programs.
FOURTH SEMESTER	
1.Course Code and Name : BCV401 Analysis of structures	
CO Statements	
At the end of the course, learners will be able	
CO1	Identify the different forms of structural systems and analyse the trusses.
CO2	Evaluate the slope and deflections in beams, frames and trusses by using moment area method and energy principle
CO3	Analyse and determine the stress resultants inarches and cables.
CO4	Analyse the indeterminate structures and construct BMD AND SFD using slope deflection methods.
CO5	Analyse the indeterminate structures and construct BMD AND SFD using Moment Distribution Method.
2.Course Code and Name : BCV402 Fluid mechanics and hydraulics	
CO Statements	
At the end of the course, learners will be able	
CO1	Explain the fundamental properties of fluids and solve problems on fluid pressure and hydrostatics.

CO2	Apply the principles of kinematics and dynamics of fluid flow to solve problems on velocity and pressure.
CO3	Compute the discharge through pipes, notches and weirs.
CO4	Design the turbines and open channels of different sections and to estimate the energy loss in hydraulic jump.
CO5	Able to interpret the experimental results of discharge, efficiency based on the test conducted in the laboratory.
3.Course Code and Name : BCV403Transportation engineering	
CO Statements	
At the end of the course, learners will be able	
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.
4.Course Code and Name : BCV404Building material testing laboratory	
CO Statements	
At the end of the course, learners will be able	
CO1	To apply knowledge of mathematics and engineering in calculating mechanical properties of structural materials.
CO2	To estimate the strength of MS and CI in Compression and Tension
CO3	To evaluate strength in Bending, Torsion and shear of MS, Wood
CO4	To analyse the strength of MS under Impact under Charpy and Izod test.
CO5	To assess the hardness of Ferrous and Non- Ferrous metals
5.Course Code and Name : BCV405D Watershed management	
CO Statements	
At the end of the course, learners will be able	
CO1	Discuss surface and ground water resources system and, human influences.
CO2	Integrate water resources system in arid and semi-arid regions and explain watershed aquifer for management.
CO3	Analyse water resources related issues for conservation and synthesize augmentation of water resources.
CO4	Design integrated watershed management system.
CO5	Apply modern tools in watershed management.
6.Course Code and Name : BCV456B GIS with Quantum GIS	
CO Statements	
At the end of the course, learners will be able	
CO1	Use open-source software for civil engineering applications.
CO2	Various tools in QGIS software.
CO3	Create thematic layers with attribute data.

CO4	Generate maps for decision making.
7.Course Code and Name : BBOK407Biology for engineers	
CO Statements	
At the end of the course, learners will be able	
CO1	Elucidate the basic biological concepts via relevant industrial applications and case studies.
CO2	Evaluate the principles of design and development, for exploring novel bioengineering projects
CO3	Corroborate the concepts of biomimetics for specific requirements
CO4	Think critically towards exploring innovative biobased solutions for socially relevant problems
8.Course Code and Name : BUHK408Universal human value course	
CO Statements	
At the end of the course, learners will be able	
CO1	Ethical human conduct
CO2	Socially responsible behaviour and holistic vision of life
CO3	Environmentally responsible work
CO4	Having Competence and Capabilities for Maintaining Health and Hygiene