Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Semester	:	**1st/2nd**				
Course Title	:	**Applied Physics for Computer Science Stream**				
Course Code	:	**23PHYS12/23PHYS22**				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Course Category	:	**ASC**				
Stream	:	**Common to all CSE based branches**		**CIE**	:	**50 Marks**
Teaching hours/ week (L:T:P:S)	:	**(2:2:2:0)**		**SEE**	:	**50 Marks**
Total Hours	:	**40 Hrs (L) + 20 Hrs (P)**		**SEE Duration**	:	**3 Hours**
Credits	:	**04**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	To explain the fundamental concepts of physics
2	To familiarize the students with various applications of physics that are relevant to the syllabus
3	To analyse given numericals and apply the theoretical concepts of physics for solving the same
4	To enlighten the concepts of physics for properties of different materials
5	To develop scientific temper among students and encourage them to do projects
6	To give an exposure towards practical knowledge for the theoretical concepts and to perform honest measurements

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Laser and Optical Fibers:** **LASER**: Einstein's A and B Coefficients and Expression for Energy Density (Derivation), Laser Action: Conditions and Requisites of a laser system, Semiconductor Diode Laser, Applications: Bar code scanner, Measurement of pollutants in the environment, Numerical Problems. **Optical Fiber**: Acceptance angle and Numerical Aperture (NA), Derivation of Expression for NA, Classification of Optical Fibers, Attenuation, Applications: Point to point communication, Numerical Problems **Pre requisite: Properties of light** **Self-learning: Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Total Internal Reflection**	8
Pedagogy	**Chalk and talk:** Expression for Energy Density (Derivation), Expression for NA **PPT:** Semiconductor Diode Laser **Videos:** Applications of Lasers and Optical Fibers	
2	**Quantum Mechanics:** de Broglie Hypothesis and Matter Waves, de Broglie wavelength and derivation of expression by analogy, Heisenberg's Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic), Principle of Complementarity, Wave Function and its properties, Time independent Schrödinger wave equation (Derivation), Physical Significance of a wave function and Born Interpretation, Expectation value, Eigen functions and Eigen Values, Particle inside one dimensional infinite potential well, it's energy Eigen values and Eigen States, Waveforms and Probabilities. Numerical Problems. **Pre requisite:Wave–Particle dualism** **Self-learning: de Broglie Hypothesis**	8
Pedagogy	**PPT:** Quantization of Energy States, Waveforms and Probabilities, Principle of Complementarity, **Video:** Quantization of Energy States, Waveforms and Probabilities **Chalk Talk** **Group Discussion**	
3	**Quantum Computing:** **Principles of Quantum Information & Quantum Computing:** Introduction to Quantum Computing, Moore's law & its end, Differences between Classical & Quantum computing. Concept of qubit and its properties. Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits. **Dirac representation and matrix operations:** Matrix representation of 0 and 1 States, Identity Operator I, Applying I to|0⟩and |1⟩ states, Pauli Matrices and its operations on |0⟩and |1⟩states, Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product), Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality. Numerical Problems	8

	Quantum Gates: Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate, CNOT Gate (Discussion for 4 different input states), Numerical Problems. **Pre requisites: Matrices** **Self-learning: Moore's law, Young's double slit experiment**	
Pedagogy	**PPT:** Introduction to Quantum Computing, Moore's law & its end, Differences between Classical & Quantum computing. Concept of qubit and its properties. **Video:** Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits. **Chalk Talk** **Group Discussion** **Seminars**	
4	**Electrical Conductivity in metals** Assumptions and Failures of Classical Free Electron Theory, Assumptions of Quantum Free Electron Theory, Fermi Energy, Density of States, Fermi Factor, Variation of Fermi Factor With Temperature and Energy level, Success of Quantum Free Electron Theory . Numerical Problems. Semiconductors and its classification, Fermi level in Intrinsic Semiconductor, Expression for concentration of electrons in conduction band & holes concentration in valence band (only mention the expression), Relation between Fermi energy & Energy gap in intrinsic semiconductors(derivation), Electrical conductivity of a semiconductor (derivation), Hall effect, Expression for Hall coefficient (derivation) and its application. **Pre requisites: Fundamentals of semiconductor** **Self-learning: Fermi energy level for extrinsic semiconductors**	**8**
Pedagogy	**PPT:** Hall coefficient (derivation) and its application. **Video:** Hall coefficient (derivation) and its application, classification of Semiconductors **Chalk Talk,Group Discussion,Seminars**	
5	**Superconductivity** Temperature dependence of resistivity, Mathessian rule, Superconductors, Meissner's Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative), Quantum Tunnelling, High Temperature superconductivity, Josephson Junctions (Qualitative), DC and RF SQUIDs, Applications: Maglev Vehicles. **Advanced Engineering Materials** Nanomaterials: properties of nanomaterials, quantum confinement(Qualitative), synthesis methods(Top-down & bottom-up approaches) and applications, Shape memory alloys (SMA), Characteristics and applications of SMAs, NiTi alloy and its properties **Pre requisites: Basics of nanomaterials** **Self-learning: Quantum Tunnelling**	**8**
Pedagogy	**PPT:** Nanomaterials and shape memory alloy **Video: Superconductor applications** **Chalk Talk** **Group Discussion** **Seminars**	

List of Experiments or Programs

Sl.No	Experiments/Programs	Cos
1	Determination of wavelength of LASER using Diffraction Grating.	6
2	Determination of acceptance angle and numerical aperture of the given Optical Fiber.	6
3	Determination of Magnetic Flux Density at any point along the axis of a circular coil	6
4	Determination of resistivity of a semiconductor by Four Probe Method	6
5	Study the I-V Characteristics of the Given Bipolar Junction Transistor	6
6	Determination of dielectric constant of the material of capacitor by Charging and Discharging method.	6
7	Study the frequency response of Series & Parallel LCR circuits.	6
8	Determination of Plank's Constant using LEDs.	6
9	Identification of circuit elements in a Black Box and determination of values of the components	6
10	Study the Characteristics of a Photo-Diode and to determine the power responsivity / Verification of Inverse Square Law of Intensity of Light	6
11	GNU Step Interactive Simulations	4
12	PHET Interactive Simulations	4

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
2	Engineering Physics-Gaur and Gupta-Dhanpat Rai Publications-2017.
3	Concepts of Modern Physics-Arthur Beiser: 6th Ed; Tata McGraw Hill Edu Pvt Ltd- New Delhi 2006
4	An Introduction to Lasers theory and applications by M.N. Avadhanulu and P.S. Hemne revised Edition 2012. S. Chand and Company Ltd –New Delhi.
5	Fundamentals of Fibre Optics in Telecommunication & Sensor Systems, B.P. Pal, New Age International Publishers.
6	Quantum Computation and Quantum Information, Michel A. Nelsen & Isaac L. Chung, Cambridge Universities Press, 2010 Edition
7	Quantum Computing, Vishal Sahani, Mc Graw Hill Education, 2007 Edition

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Understand the various fundamental concepts in Applied Physics	Remember/Understand	L1/L2
CO2	Apply the basic principles of physics in diverse engineering applications	Apply	L3
CO3	Analyse the given numerical and find the solutions	Analyse	L4
CO4	Design the simulations with the applications of physics	Evaluate	L5
CO5	Create scientific models, reports and posters in teams on applied physics themes	Create	L6
CO6	Conduct experiments in physics and perform precise and accurate measurements	Evaluate	L5

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CO2	3	--	--	--	--	--	--	--	--	--	--	--	--	--
CO3	--	2	--	--	--	--	--	--	--	--	--	--	--	--
CO4	--	--	2	--	2	--	--	--	--	--	--	--	--	--
CO5	--	--	--	--	--	--	--	--	2	2	--	1	--	--
CO6	--	--	--	--	2	--	--	--	2	2	--	2	--	--

Weblinks and Video Lectures (e-Resources)	
1	**Laser:**https://www.britannica.com/technology/laser,k
2	**Laser:**https://nptel.ac.in/courses/115/102/115102124/
3	**Quantum mechanics:**https://nptel.ac.in/courses/115/104/115104096/
4	**Physics:**http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
5	**Numerical Aperture of fiber:**https://bop-iitk.vlabs.ac.in/exp/numerical-aperture-measurement

Assessment Pattern (both CIE and SEE)

Applied Science Courses								
4 credits – (IPCC) - Theory and Practical								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Theory + Practical				**50**			**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module - 1 & 2	50	(50+50+50) / 3	**15**	6	Average of Three Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module - 3 & 4	50				
		Internal Assessment Test (IAT) - III	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25

CIE	**Practical**	Conduction of Experiments	Continuous Evaluation of each experiment			Average of all Experiments	10	4	Performance of the Experiment (On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. 20 marks are for conducting the experiment and calculations/observations/output)
			Record	05	10				
			Observation book	05					
		Practical Test	Write up	15	50	----	10	4	One Internal Practical Test after conduction of all Experiments for 50 Marks
			Execution	25					
			Viva-voce	10					
		Open Ended Experiment	Write up	05	20	----	5	2	One experiment for 20 marks. 20 marks reduced to 05 marks
			Execution	10					
			Viva-voce	05					
	Total CIE Practical						25	10	Scale down Marks of Experiments, Record, Observation, Practical Test and Open-Ended Experiment

SEE		Theory exam	Entire theory syllabus including questions from lab component	100	----	50	18	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	
				• The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component. • The Laboratory Component for the IPCC shall be for CIE only. • However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.				

The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:
Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.
The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):
The CIE Marks for the theory component of the IC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IC
Internal Assessment test:

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks** scaled down to **25 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **15 Marks.**

Continuous and Comprehensive Assessment (CCA):
Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**

	Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks** **CIE for the practical component of the IC** • On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **10 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester and **5 Marks** for conducting Open Ended Experiments. • The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks conduction(Observation Book) and 5 Marks for Record Book. Marks of all experiments' write-ups and conduction are added and scaled to **10 Marks.** • The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **10 Marks.** • Open Ended Experiments are conducted after the completion of regular Experiments/Programs for 20 Marks and scaled down to **5 Marks** • Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**. • The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component. • The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks. The theory component of the IC shall be for both CIE and SEE. **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)** • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. The duration of SEE is 03 hours. • The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**. • 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. The two questions should be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	10	10	10			
Understand	24	24	24			15
Apply	8	8	8			
Analyse	8	8	8			10
Evaluate				50	50	25
Create						

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1		Test-2		Test-3			
	Module-1	Module-2	Module-2	Module-3	Module-4	Module-5		
CO1	6	4	4	6	6	4	30	20
CO2	16	8	8	16	10	14	72	48
CO3	4	4	4	4	4	4	24	16
CO4	4	4	4	4	4	4	24	16
CO5								
CO6								
Total	30	20	20	30	24	26	150	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	16
Understand	40
Apply	16
Analyse	28
Evaluate	--
Create	--

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	25	25	22	20	20	112	56
CO2	6	6	8	6	6	32	16
CO3	10	10	10	12	14	56	28
CO4	--	--	--	--	--	--	--
CO5	--	--	--	--	--	--	--
CO6	--	--	--	--	--	--	--
Total	41	41	40	38	40	200	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Einstein's A and B Coefficients : Rates of Absorption and emissions, Thermal Equilibrium, Boltzmann Relation, Derivation of Expression for Energy Density. Conclusions on Einstein's coefficients	1.5 Hrs
1	Laser Action: Population Inversion explanation, Metastable State: Description using 3 level system, Requisites of a laser system : Energy Source, Active Medium, Laser Cavity	1
1	Semiconductor Diode Laser: Principle, Construction, Working, merits and demerits. Applications of LASER: Bar code scanner, Measurement of pollutants	1
1	Numerical Problems: Einstein coefficients, Boltzmann factor	0.5
1	Propagation of Light Through the Optical fiber (Ray Diagram), Acceptance angle and Numerical Aperture (NA) Explanation and derivation	1
1	Modes of Propagation and RI Profile, Classification of Optical Fibers: Single Mode Step Index and Multi Mode Step and Graded Index Fibers,	1
1	Attenuation, Attenuation Coefficient, Types of Fiber Losses: Absorption, Scattering and Geometrical Losses, Applications: point to point Communication	1
1	Numerical Problems : Numerical Aperture, Acceptance angle and Attenuation Co-efficient.	1
2	Statement of de-Broglie Hypothesis, Derivation of expression for de Broglie wavelength (λ) by analogy and different forms of expression for (λ)	1
2	Heisenberg's Uncertainty Principle, Non existence of electron inside the nucleus (Non-relativistic),	1
2	Principle of Complementarity, Correlation between de Broglie Wavelength, Heisenberg's Uncertainty principle and wave packet, Wave Function, Explanation, General Mathematical Form (Exponential),	1
2	Physical Significance of a wave function (Probability Density) and Born Interpretation, Expectation value, Eigen functions and Eigen Values,	1
2	Schrödinger Time Independent wave definition, Setting up of Time independent Schrodinger wave equation in 1D (derivation) and extension to 3D (mention)	1
2	One Dimensional Potential Well Explanation and Boundary conditions, Schrödinger Wave equation for a particle in 1 D infinite potential well, General Solution, Applying Boundary Conditions, Energy Eigen Values (Quantization of Energy States), Normalization and Eigen Function, Variation of wave functions and probability density distributions for n = 1, 2, 3 states	2
2	Numerical Problems on de Broglie Hypothesis, Heisenberg's Uncertainty Principle, Energy Eigen Values for a particle in 1D infinite potential well	1
3	Introduction to Quantum Computing, Moore's law & its end. Differences between classical & quantum computing.	1
3	Concept of qubit and its properties. Representation of qubit by Bloch sphere. single and two qubits. Extension to N qubits.	1
3	Matrix representation of 0 and 1 States, Identity Operator I, Applying I to |0> and |1> states to show there is no change, Pauli Matrices and its operations on 0 and 1 states, Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary Matrix U, Examples: Row and Column Matrices and	2

	their multiplication (Inner Product), Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality.	
3	Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate	1
3	Controlled gate, CNOT Gate,	1
3	Numerical Problems: Identity, Unitary, Inner Product, Orthogonality, Gates: X Gates, Hadamard Gate, CNOT Gate, Relating T and S gates (Standard Forms),	2
4	Assumptions and Failures of Classical Free Electron Theory, Assumptions of Quantum Free Electron Theory,	2
4	Fermi Energy, Density of States, Fermi Factor, Variation of Fermi Factor With Temperature and Energy level, Success of Quantum Free Electron Theory.	1
4	Semiconductors and its classification, Fermi level in Intrinsic Semiconductor, Expression for concentration of electrons in conduction band & holes concentration in valance band (only mention the expression),	2
4	Relation between Fermi energy & Energy gap in intrinsic semiconductors(derivation), Electrical conductivity of a semiconductor (derivation), Explanation of Hall Effect, Hall Voltage, Hall field, Derivation of Expression for Hall coefficient and Hall Voltage. Applications.	2
4	Numerical Problems: Fermi energy, Fermi factor, electrical conductivity metals, semiconductor	1
5	General Introduction about Superconductivity, Graphical approach of Temperature dependence of resistivity in metals, Mathiessen's rule [$\rho=\rho 0+\rho(T)$], Temperature dependence of resistivity in superconductors, Definition of superconductivity & Critical temperature. Meissner's Effect,	1
5	Critical field, Temperature dependence of Critical field, Detailed explanation of Type1 & Type-II Superconductors. BCS Theory: Phonon & Phonon field, cooper pairs, High Temperature Superconductors(qualitative)	1
5	Brief explanation of SQUID & mention its applications, The construction and working of MAGLEV vehicle.	1
5	Numerical Problem: Critical field, Maithessen's rule	1
5	Nanomaterials, synthesis methods (qualitative) properties and applications, quantum confinement(Qualitative),	2
5	Shape memory alloys (SMA), Characteristics, Properties of NiTi alloy, applications,	1
Total		40 Hrs

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Semester	:	**1st and 2nd**				
Course Title	:	**Applied Chemistry for Computer Science Stream**				
Course Code	:	**23CHES12/23CHES22**				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Course Category	:	**ASC**				
Stream	:	**Common to CSE branches**		**CIE**	:	**50 Marks**
Teaching hours/ week (L:T:P:S)	:	**(2:2:2:0)**		**SEE**	:	**50 Marks**
Total Hours	:	**60 Hrs**		**SEE Duration**	:	**3 Hours**
Credits	:	**04**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	To enable students to acquire knowledge on electrochemistry and corrosion chemistry.
2	To understand the mechanism of corrosion, thermodynamics and sensors to solve the societal problems.
3	To learn the significance of green chemistry, analytical techniques and nano materials.
4	To provide in-depth knowledge of Engineering materials.

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyse information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**ELECTROCHEMISTRY AND ENERGY STORAGE SYSTEMS** **Electrochemistry**: Basic concepts of electrochemistry; Electrode system: types of electrodes, Ion selective electrode – definition, construction, working and applications of glass electrode. Determination of pH using glass electrode. Reference electrode: Construction, working and applications of Calomel electrode. Concentration cells and Numerical problems. **Energy Storage Systems:** Introduction, Classification of batteries. Battery characteristics (Energy density, Shelf life, Life cycle) Construction, working and applications of: Sodium-Ion battery, vanadium redox flow battery. **Fuel Cells**- Introduction, Classification of fuel cells based on the type of fuel, electrolyte and temperature. Differences between the Conventional cell and fuel cell, Construction, working and applications of CH_3OH-O_2 fuel cell.	8
Pedagogy	Animated videos on battery and fuel cells, PPT on reference electrodes, Student's presentation on fuel cells and numerical problems.	
2	**CORROSION AND ITS CONTROL** **Corrosion:** Introduction, Electrochemical theory, types: differential aeration (waterline and pitting), differential metal and stress corrosion. Factors affecting rate of corrosion (Anodic to cathodic area ratio, Nature of corrosion product, Nature of medium-PH, temperature, conductance). Corrosion control: Metal coating-galvanization and tinning, surface conversion coating - anodizing. Cathodic protection - sacrificial anode method and impressed current method. Corrosion penetration rate (CPR), numerical problems. **Metal finishing:** Introduction, Technological importance. Electroplating: Introduction, Conditions for electroplating, electroplating of chromium, Electroless plating: Introduction, electroless plating of copper, distinction between electroplating and electroless plating processes.	8
Pedagogy	Field visit to identify different types of corrosion, Animated videos and PPTs on electroplating and electroless plating, PPT on reference electrodes, Student's presentation on corrosion control and numerical problems.	

3	**GREEN CHEMISTRY AND NANOMATERIALS** **Green Chemistry:** Introduction, 12 principles with real life examples, green synthesis of paracetamol. Introduction, construction, working and application of P V cell. **Nanomaterials:** Introduction, size-dependent properties, Synthesis of nanomaterials: Top-down and bottom-up approaches, Synthesis by Sol-gel and precipitation, Nanoscale materials: Fullerenes, Carbon nanotubes, and graphene's – properties and applications.	**8**
Pedagogy	Videos on nanomaterial synthesis, PPT on nanoscale materials, Student's group discussion on green route synthesis of drugs.	
4	**SENSORS AND DISPLAY SYSTEMS** **Sensors:** Introduction, working, principle and applications of Conductometric sensors, Electrochemical sensors, Thermometric sensors and Optical sensors. Sensors for the measurement of dissolved O_2 (DO). Electrochemical gas sensors for SOx and NOx. **Display Systems:** Photoactive and electro active materials, Nanomaterials and organic materials used in optoelectronic devices. Liquid crystals: Introduction, classification, properties and application. Liquid Crystal Displays (LCD's). Properties and application of Organic Light Emitting Diodes (OLED's) and Quantum Light Emitting Diodes (QLED's).	**8**
Pedagogy	Animated videos on sensors and display systems, PPT on Display system, Assignment and student's presentation on sensors applications.	
5	**THERMODYNAMICS AND CHEMICAL KINETICS:** **Thermodynamics:** I and II Laws of thermodynamics – spontaneous and non-spontaneous processes, entropy, Free energy and chemical equilibrium – significance of entropy. Electrochemical Equilibrium, Application of thermodynamics to real world problems. **Chemical Kinetics:** Rate of a chemical reaction, factors affecting rate of reaction, Law of mass action – Le Chatelier's principle. Rate expression, order, and molecularity of reactions, zero order, first order and pseudo first order reaction – half-life period. Determination of rate constant and order of reaction. Temperature dependence of rate constant – Arrhenius equation, activation energy and its calculation; elementary concept of collision theory of bimolecular gaseous reactions.	**8**
Pedagogy	PPT on thermodynamics, videos on chemical Kinetics. Presentation on Free energy.	

List of Experiments or Programs

Expt. No.	Volumetric Experiments (Any 4)
1	Estimation of total hardness of water by EDTA method
2	Determination of COD of waste water.

3	Estimation of Iron in steel using standard $K_2Cr_2O_7$ solution by using external indicator method
4	Determination of percentage of copper in brass using standard sodium thiosulphate solution
5	Determination of amount of chlorine present in Bleaching powder (Iodometry)
Instrumental Experiments (Any 4)	
1	Potentiometric estimation of FAS using standard $K_2Cr_2O_7$ solution.
2	Conductometric estimation of acid mixture using strong base.
3	Determination of viscosity of given organic liquid using Oswald's Viscometer.
4	Determination of pKa of the given weak acid using pH meter.
5	Colorimetric estimation of copper.
Open Ended Experiment (Any 2)	
1	Estimation of Sodium present in soil/effluent sample using flame photometry
2	Chemical Structure drawing using software: ChemDraw or ACD/ChemSketch
3	Synthesis of Iron oxide nanomaterials
4	Estimation of CaO present in the given cement sample by EDTA method

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Chemistry for Engineers, Teh Fu Yen, Imperial college press, 2008, ISBN: 97818609747742.
2	Advances in corrosion science and technology, M.G. Fontana, R.W. Staettle, Springer publications, 2012, ISBN: 9781461590620.
3	Fundamentals of analytical chemistry, Douglas A. Skoog et.al., 8th edition, 2004, Thomson Asia ptv Ltd. ISBN: 978-0-495-55828-6
4	Engineering chemistry, Shubha Ramesh et.al., Wiley India, 1 st Edition, 2011, ISBN: 9788126519880.
5	Energy storage and conversion devices, Anurag Gaur, A. L. Sharma, Anil Arya, 2021, CRC Press, Taylor and Francis Group, 1 st Edition, ISBN: 9781003141761.
6	P. Atkins and J. de Paula, Atkins Physical Chemistry, Oxford University Press, 8th edition, 2006.

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Understand the basic concepts of chemistry to explain the scientific engineering concepts.	L1	Understand
CO2	Apply the concepts of chemistry to describe various engineering processes.	L2	Apply
CO3	Analyse chemical processes and instrumentation techniques to explain the properties and applications of engineering materials.	L2	Analyse
CO4	Design different types of engineering materials based on the concepts of chemistry.	L3	Design
CO5	Evaluate the concepts of chemistry for energy production and multidisciplinary application.	L4	Evaluate
CO6	Conduct/Perform the quantitative analysis of a given substance using various experimental techniques.	L4	Conduct

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	3	--	--	--	2	--	--	--	--	1	--	--
CO2	3	2	2	--	--	--	2	--	--	--	--	--	--	--
CO3	3	2	2	--	--	--	2	--	--	--	--	1	--	--
CO4	3	2	1	--	--	--	2	--	--	--	--	--	--	--
CO5	3	2	--	--	--	--	2	--	--	--	--	--	--	--
CO6	3	3					2							

Weblinks and Video Lectures (e-Resources)	
1	https://archive.nptel.ac.in/courses/113/104/113104082/, https://ehs.stanford.edu/topic/hazardous-materials/nanomaterials
2	https://www.youtube.com/watch?v=EoE_NkF8N8k, https://www.youtube.com/watch?v=EZ8P5Dp1j2g
3	https://www.youtube.com/watch?v=3XpuoVVzT1A, https://chemistnotes.com/all-nanochemistry-notes/
4	https://www.youtube.com/watch?v=T4pSuflO9fk, https://www.youtube.com/watch?v=4HCsBMI7nSg

Applied Science Courses

4 credits – (IPCC) - Theory and Practical

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**			**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module - 1 & 2	50	(50+50+50) / 3	**15**	6	Average of Three Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module - 3 & 4	50				
		Internal Assessment Test (IAT) - III	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25

CIE	**Practical**	Conduction of Experiments	Continuous Evaluation of each experiment			Average of all Experiments	10	4	Performance of the Experiment (On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. 20 marks are for conducting the experiment and calculations/observations/output)
			Record	05	10				
			Observation book	05					
		Practical Test	Write up	15	50	----	10	4	One Internal Practical Test after conduction of all Experiments for 50 Marks
			Execution	25					
			Viva-voce	10					
		Open Ended Experiment	Write up	05	20	----	5	2	One experiment for 20 marks. 20 marks reduced to 05 marks
			Execution	10					
			Viva-voce	05					
	Total CIE Practical						25	10	Scale down Marks of Experiments, Record, Observation, Practical Test and

								Open-Ended Experiment
SEE		Theory exam	Entire theory syllabus including questions from lab component	100	----	50	18	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	
				• The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component. • The Laboratory Component for the IPCC shall be for CIE only. • However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.				

4 Credit Course – IPCC

The Minimum Marks to be secured in CIE to appear for SEE shall be 10marks (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:

Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.
The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):

The CIE Marks for the theory component of the IPCC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IPCC
Internal Assessment Test (IAT):

The IA test questions are to be framed to map the Course Outcomes(COs), Program Outcomes(POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **15 Marks.**

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.

	○ The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report Total score for CCA is **10 Marks** Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks** **CIE for the practical component of the IPCC** • On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **10 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester and **5 Marks** for conducting Open Ended Experiments. • The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks conduction(Observation Book) and 5 Marks for Record Book. Marks of all experiments' write-ups and conduction are added and scaled to **10 Marks.** • The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **10 Marks.** • Open Ended Experiments are conducted after the completion of regular Experiments/Programs for 20 Marks and scaled down to **5 Marks** • Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**. • The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component. • The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks. The theory component of the IC shall be for both CIE and SEE. **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.** • The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**. • 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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

3 Credit Course – Theory	
	Note: A few of the Courses of 3 Credit are Integrated Course Type, for such courses the method suggested for 4 Credit IPCC shall be followed.

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:

Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Group Problem Solving, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.

The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):

The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**.

Internal Assessment test:

The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks** scaled down to **25 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **25 Marks.**

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **25 Marks**
Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks**

Semester End Examination (SEE):

- Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject
- The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.**

	• The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student must answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**. 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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	15	15	15	--	--	--
Understand	25	20	20	--	--	--
Apply	5	10	10	20	20	20
Analyse	5	5	5	10	10	10
Evaluate	--	--	--	20	20	20
Create	--	--	--	--	--	--

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1		Test-2		Test-3			
	Module-1	Module-2	Module-3	Module-4	Module-4	Module-5		
CO1	8	8	6	4	6	6	38	26%
CO2	10	10	16	8	8	16	68	46%
CO3	4	2	4	4	4	4	22	14%
CO4	4	4	4	4	2	4	22	14%
CO5	--	--	--	--	--	--	--	--
CO6	--	--	--	--	--	--	--	--
Total	26	24	30	20	20	30	150	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	16
Understand	28
Apply	32
Analyse	24
Evaluate	--
Create	--

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	4	4	4	2	2	16	16%
CO2	8	8	4	4	4	28	28%
CO3	4	4	8	8	8	32	32%
CO4	4	4	4	6	6	24	24%
CO5	--	--	--	--	--	--	--
CO6	--	--	--	--	--	--	--
Total	20	20	20	20	20	100	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	**ELECTROCHEMISTRY AND ENERGY STORAGE SYSTEMS** **Electrochemistry**: Basic concepts of electrochemistry; Electrode system: Introduction, types of electrodes	1
	Ion selective electrode – definition, construction, working and applications of glass electrode. Determination of pH using glass electrode.	1
	Reference electrode: Introduction, calomel electrode – construction, working and applications of calomel electrode.	1
	Concentration cell – Definition, construction and Numerical problems.	1
	Energy Storage Systems: Classification of batteries, with examples. Battery characteristics, cycle life and shelf life.	1
	Construction, working and applications of: Sodium-Ion battery, vanadium redox flow battery	1
	Fuel Cells- Introduction, Classification of fuel cells based on the type of fuel, electrolyte and temperature.	1
	Differences between the Conventional cell and fuel cell, Construction, working and applications of methanol -oxygen.	1
2	**CORROSION AND ITS CONTROL: Corrosion:** Introduction, Electrochemical theory.	1
	Types: differential aeration (waterline and pitting), differential metal and stress corrosion	1
	Factors affecting rate of corrosion. Corrosion control: Metal coating-galvanization and tinning,	1
	Surface conversion coating - anodizing and phosphating. Cathodic protection - sacrificial anode method.	1
	Impressed current method. corrosion penetration rate (CPR), numerical problems.	1
	Metal finishing: Introduction, Technological importance. Electroplating: Introduction, conditions for electroplating.	1
	Electroplating of Chromium, Electroless plating: Introduction, distinction between electroplating and electroless plating processes.	1
	Electroless plating: Introduction, electroless plating of copper.	1
3	**GREEN CHEMISTRY AND NANOMATERIALS** **Green Chemistry:** Introduction, 12 principles with real life examples	1
	validation of greenness, industrial application of green chemistry	1
	Introduction, construction, working and application of P V cell.	1
	Nanomaterials: Introduction, size-dependent properties (Surface area, Electrical, Optical, and Catalytic properties).	1
	Synthesis of nanomaterials: Top-down and bottom-up approaches, Synthesis by Sol-gel method.	1
	Precipitation and chemical vapor deposition	1
	Nanoscale materials: Fullerenes, Carbon nanotubes	1
	graphene's – properties and applications.	1
4	**SENSORS AND DISPLAY SYSTEMS:** **Sensors:** Introduction, working, principle and applications of Conductometric sensors, Electrochemical sensors	1
	Thermometric sensors (Flame photometry) and Optical sensors (colorimetry).	1
	Sensors for the measurement of dissolved oxygen (DO). Electrochemical sensors for the pharmaceuticals. Electrochemical gas sensors for SOx and NOx.	1

	Disposable sensors in the detection of biomolecules and pesticides.	**1**
	Display Systems: Photoactive and electro active materials.	**1**
	Nanomaterials and organic materials used in optoelectronic devices. Liquid crystals (LC's) - Introduction, classification, properties and application.	**1**
	Introduction, classification, properties and application in Liquid Crystal Displays (LCD's). Properties and application of Organic Light Emitting Diodes (OLED's)	**1**
	Quantum Light Emitting Diodes (QLED's).	**1**
5	**THERMODYNAMICS AND CHEMICAL KINETICS:** **Thermodynamics:** I and II Laws of thermodynamics – spontaneous and non-spontaneous processes.	**1**
	Entropy, Free energy(Gibbs free energy – Standard Gibbs free energy change) and chemical equilibrium – significance of entropy.	**1**
	Electrochemical Equilibrium. Application of thermodynamics to real world problems.	**1**
	Chemical Kinetics: Rate of a chemical reaction, factors affecting rates of reaction,	**1**
	Law of mass action – Le Chatelier's principle. Rate expression, order, and molecularity of reactions, zero order, first order reactions.	**1**
	Pseudo first order reaction – half-life period. Determination of rate constant and order of reaction.	**1**
	Temperature dependence of rate constant – Arrhenius equation, activation energy and its calculation;	**1**
	Elementary concept of collision theory of bimolecular gaseous reactions.	**1**
Total		**40 Hrs**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**1st**				
Course Title	:	**Communicative English**				
Course Code	:	**23CENC16**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Course Category	:	**HSSC**				
Stream	:	**Common to All Branches**		**CIE**	:	**50 Marks**
Credits (L:T:P:S)	:	**1:0:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**15 Hrs**		**SEE Duration**	:	**2 Hours**
Credits	:	**1**				

Course Learning Objectives: Students will be taught.

Sl.No	Course Objectives
1	To know about Fundamentals of Communicative English and Communication Skills in general.
2	To train to identify the nuances of phonetics, intonation and enhance pronunciation skills for better Communication skills.
3	To impart basic English grammar and essentials of important language skills.
4	To enhance with English vocabulary and language proficiency for better communication skills.
5	To learn about Techniques of Information Transfer through presentation.

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyse information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Introduction to Communicative English**: Communicative English, Fundamentals of Communicative English, Process of Communication, Barriers to Effective Communicative English, Different styles and levels in Communicative English. Interpersonal and Intrapersonal Communication Skills.	03
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation-based learning (iii) Personalized learning (iv) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	
2	**Introduction to Phonetics**: Phonetic Transcription, English Pronunciation, Pronunciation Guidelines to consonants and vowels, Sounds Mispronounced, Silent and Non silent Letters, Syllables and Structure. Word Accent, Stress Shift and Intonation, Spelling Rules and Words often Misspelt. Common Errors in Pronunciation.	03
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation-based learning (iii) Personalized learning (iv) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	
3	**Basic English Communicative Grammar and Vocabulary PART- I**: Grammar: Basic English Grammar and Parts of Speech, Articles and Preposition. Question Tags, One Word Substitutes, Strong and Weak forms of words, Introduction to Vocabulary, All Types of Vocabulary – Exercises on it.	03
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation-based learning (iii) Personalized learning (iv) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	

4	**Basic English Communicative Grammar and Vocabulary PART - II:** Words formation - Prefixes and Suffixes, Contractions and Abbreviations. Word Pairs (Minimal Pairs) – Exercises, Tense and Types of tenses, The Sequence of Tenses (Rules in use of Tenses) and Exercises on it.	**03**
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation-based learning (iii) Personalized learning (iv) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	
5	**Communication Skills for Employment**: Information Transfer: Oral Presentation and its Practice. Difference between Extempore/Public Speaking, Communication Guidelines. Mother Tongue Influence (MTI), Various Techniques for Neutralization of Mother Tongue Influence. Reading and Listening Comprehensions – Exercises.	**03**
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation-based learning (iii) Personalized learning (iv) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Communication Skills by Sanjay Kumar & Pushp Lata, Oxford University Press India Pvt Ltd - 2019.
2	A Textbook of English Language Communication Skills, (ISBN-978-81-955465-2-7), Published by Infinite Learning Solutions, Bengaluru - 2022.
3	Technical Communication: Principals & Practice (Third edition) Meenakshi Raman & Sangeeta Sharma Oxford University Press
4	Technical Communication by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.
5	English Language Communication Skills – Lab Manual cum Workbook, Cengage learning India Pvt Limited [Latest Revised Edition] – (ISBN-978-93-86668-45-5), 2019.
6	A Course in Technical English – D Praveen Sam, KN Shoba, Cambridge University Press – 2020.
7	Practical English Usage by Michael Swan, Oxford University Press – 2016.

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Understand and apply the Fundamentals of Communication Skills in their communication skills.	Understand	L-2
CO2	Identify the nuances of phonetics, intonation and enhance pronunciation skills.	Remember	L-1
CO3	To impart basic English grammar and essentials of language skills as per present requirement.	Understand	L-2
CO4	Understand and use all types of English vocabulary and language proficiency.	Understand	L-2
CO5	Adopt the Techniques of Information Transfer through presentation.	Remember	L-1

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	--	--	--	--	--	--	--	--	2	2	--	2	--	--
CO2	--	--	--	--	--	--	--	--	1	1	--	1	--	--
CO3	--	--	--	--	--	--	--	--	1	2	--	2	--	--
CO4	--	--	--	--	--	--	--	--	2	2	--	1	--	--
CO5	--	--	--	--	--	--	--	--	2	1	--	2	--	--

Weblinks and Video Lectures (e-Resources)	
1	https://drive.google.com/drive/folders/1rqloQbY2HWu7xbFSmaGU3YAc7Tbhc3b1
2	https://drive.google.com/file/d/1UbpxJBcZNFyCxMEK0KqpR6NjpNfd4e1n/view?usp=drive_link
3	https://drive.google.com/file/d/11GUI1amPCq75n8mHoGnc9qzv_OJFzCHM/view?usp=drive_link
4	https://drive.google.com/file/d/1RbPsNDA_ATiTXP_Tn8y2Udpc2NZTcvoy/view?usp=drive_link
5	https://drive.google.com/file/d/1brLXNdwBFugdZJ1B4_TtzN43_KhhZvZl/view?usp=drive_link

Assessment Pattern (both CIE and SEE)

Constitution of India / Samskruthika Kannada / Communicative English / Professional writing skills in English								
1 Credit Courses – Theory								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Theory				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) – I (MCQ)	Module - 1 & 2	50	(50+50+50) / 3	**15**	6	Average of Three Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) – II (MCQ)	Module - 3 & 4	50				
		Internal Assessment Test (IAT) – III (QUIZ)	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory							

						25	10	Scale down Marks of IAT and CCA to 25
SEE		Theory exam – (MCQ Type)	Entire syllabus	50	----	50	18	SEE Exam is theory Exam with MCQ type Question Papers of 50 Questions with each question 1 Mark each. Examination duration is 1 Hour
CIE + SEE				100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

1 Credit Course – Theory	
	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). The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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. **Possible continuous and comprehensive assessment:** Crossword, Maize, Debate, Role Play, Community Service, Mind Map, Concept Map, Case Study, Group Discussions, Ideations The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC). **Continuous Internal Evaluation (CIE):** The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**. **Internal Assessment test:** **The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels.** Three Tests (MCQ) each of **50 Marks** • First test after 6th week of the semester (syllabus completion of 35 – 40%) • Second test after 10th week of semester (syllabus completion of 65 – 70%) • Third test after 14th week of semester (syllabus completion of 90 – 100%) The average score of three test is taken and scaled down to **25 Marks.** **Continuous and Comprehensive Assessment (CCA):** Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**. • CCA1 to be conducted after 4th week • CCA2 to be conducted after 9th week. • The evaluation of CCAs includes either through quiz or rubrics Total score for CCA is **25 Marks** Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks** **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject . • The question paper shall be set for 50 Marks. The medium of the question paper shall be English. **The duration of SEE is 01 hours.** • The question paper will have 50 MCQs **covering all modules**. The questions shall map with the course outcome, program outcome and Blooms RBT level.

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	18	17	18	**17**	**18**
Understand	16	15	13	**15**	**17**
Apply	8	10	9	**8**	**7**
Analyse	**8**	**8**	10	10	8
Evaluate	**--**	**--**	--	--	--
Create	**--**	**--**	--	--	--

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	18	6	--	--	2	26	20%
CO2	7	19	--	--	2	28	25%
CO3	--	--	17	7	8	32	20%
CO4	--	--	8	18	8	34	20%
CO5	--	--	--	--	30	30	15%
Total	25	25	25	25	50	--	--

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	35%
Understand	30%
Apply	20%
Analyse	15%
Evaluate	--
Create	--

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	3	2	2	2	1	10	20%
CO2	4	3	2	3	3	15	30%
CO3	2	1	2	3	2	10	20%
CO4	2	3	2	1	2	10	20%
CO5	2	1	1	1	0	5	10%
Total	13	10	09	10	8	50	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Communicative English, Fundamentals of Communicative English, Process of Communication	1
1	Barriers to Effective Communicative English,	1
1	Different styles and levels in Communicative English. Interpersonal and Intrapersonal Communication Skills.	1
2	Phonetic Transcription, English Pronunciation, Pronunciation Guidelines to consonants and vowels	1
2	Sounds Mispronounced, Silent and Non silent Letters, Syllables and Structure. Word Accent	1
2	Stress Shift and Intonation, Spelling Rules and Words often Misspelt. Common Errors in Pronunciation	1
3	Grammar: Basic English Grammar and Parts of Speech, Articles and Preposition	1
3	Question Tags, One Word Substitutes,	1
3	Strong and Weak forms of words, Introduction to Vocabulary, All Types of Vocabulary– Exercises on it	1
4	Words formation - Prefixes and Suffixes	1
4	Contractions and Abbreviations. Word Pairs (Minimal Pairs) – Exercises,	1
4	Tense and Types of tenses, The Sequence of Tenses (Rules in use of Tenses) and Exercises on it.	1
5	Information Transfer: Oral Presentation and its Practice. Difference between Extempore/Public Speaking	1
5	Communication Guidelines. Mother Tongue Influence (MTI), Various Techniques for Neutralization of Mother Tongue Influence	1
5	Reading and Listening Comprehensions – Exercises	1
	Revision	
Total		**15 Hrs**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**1st**				
Course Title	:	**COMPUTER AIDED ENGINEERING DRAWING**				
Course Code	:	**23ESCM12**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Course Category	:	**ESC**				
Stream	:	**Common to all Branches**		**CIE**	:	**50 Marks**
Teaching hours/ week (L:T:P:S)	:	**2:0:2:0**		**SEE**	:	**50 Marks**
Total Hours	:	**40 Hrs Theory**		**SEE Duration**	:	**03 Hours**
Credits	:	**03**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	To understand the basic principles and conventions of engineering drawing
2	To visualize and generate pictorial views of engineering components using CAD software
3	To employ drawing as a communication mode

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize and analyse information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Introduction to Computer Aided Sketching:** Significance of Engineering drawing, Introduction to Computer Aided Drafting software, Co-ordinate system and reference planes. Definitions of HP, VP, RPP & LPP. **Orthographic Projections of points, Straight lines:** Introduction, Definitions - Planes of projection, reference line and conventions employed, Projections of points in all the four quadrants. Projections of straight lines (located in First quadrant/first angle only), True and apparent lengths, True and apparent inclinations to reference planes (No application problems)	8
Pedagogy	Chalk & Talk Use of Models and Software	
2	**Orthographic Projections of Planes (First Angle of Projection only):** Introduction, Definitions – projections of plane surfaces–triangle, square, rectangle, square, pentagon, hexagon and circle, planes in different positions by change of position method only (No problems on side views)	8
Pedagogy	Chalk & Talk Use of Models and Software	
3	**Projections of Solids (First Angle of Projection only):** Introduction, Definitions – Projections of right regular tetrahedron, hexahedron (cube), prisms, pyramids, cylinders and cones in different positions (No problems on freely suspended solids and combination of solids)	8
Pedagogy	Chalk & Talk Use of Models and Software	
4	**Isometric Projections (Using Isometric Scale Only):** Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of tetrahedron, hexahedron(cube), right regular prisms, pyramids, cylinders, cones, spheres, hemispheres and combination of two simple solids	8
Pedagogy	Chalk & Talk Use of Models and Software	
5	**Development of Lateral surfaces:** Development of lateral surfaces of above solids, their frustums and truncations. (No problems on lateral surfaces of trays, tetrahedrons, spheres and transition pieces)	8
Pedagogy	Chalk & Talk Use of Models and Software	

Reference Books

	Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)
1	K. R. Gopalakrishna, & Sudhir Gopalakrishna: Textbook of Computer Aided Engineering Drawing, 39th Edition, Subash Stores, Bangalore, 2017
2	Bhatt, N.D., Engineering Drawing: Plane and Solid Geometry, 53rd edition, Charotar Publishing House Pvt. Limited, 2019.

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Develop the Orthographic Projections of points, Straight lines and Planes using concepts of First Angle of Projections	C	L6
CO2	Develop the Orthographic Projections of various solids using concepts of First Angle of Projections	C	L6
CO3	Develop the Isometric Projections of solids, development drawings of lateral surfaces of solids	C	L6
CO4	Develop the Orthographic projections of solids by manual sketching	C	L6
CO5	Develop the isometric projections of solids by manual sketching	C	L6

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	--	--	--	3	--	--	--	--	--	--	--
CO2	3	--	--	--	3	--	--	--	--	--	--	--
CO3	3	--	--	--	3	--	--	--	--	--	--	--
CO4	3	--	--	--	--	--	--	--	--	--	--	--
CO5	3	--	--	--	--	--	--	--	--	--	--	--

Weblinks and Video Lectures (e-Resources)	
1	https://youtu.be/1gDmNDJ9SHc
2	https://youtu.be/cQHDAfrptUc
3	https://youtu.be/GFulyqgB5g0

Assessment Pattern (both CIE and SEE)

Engineering Science Course (ESC) / Emerging Technology Course (ETC) / Programming Language Course (PLC)								
3 credits - Theory								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Theory + Practical				**50**			**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module - 1 & 2	50	(50+50+50) / 3	**25**	10	Average of Three Internal test each of 50 Marks scale down the marks to 25 Marks
		Internal Assessment Test (IAT) - II	Module - 3	50				
		Internal Assessment Test (IAT) - III	Module – 4 & 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**50**	20	Scale down Marks of IAT and CCA to 50

SEE		Theory exam	Entire theory syllabus including questions from lab component	100	----	50	18	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	
				• The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component. • The Laboratory Component for the IPCC shall be for CIE only. • However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.				

4 Credit Course – IPCC

The Minimum Marks to be secured in CIE to appear for SEE shall be 10marks (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:

Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.
The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):

The CIE Marks for the theory component of the IPCC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IPCC
Internal Assessment Test (IAT):

The IA test questions are to be framed to map the Course Outcomes(COs), Program Outcomes(POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **15 Marks.**

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

	Total score for CCA is **10 Marks** Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks** **CIE for the practical component of the IPCC** • On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **10 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester and **5 Marks** for conducting Open Ended Experiments. • The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks conduction(Observation Book) and 5 Marks for Record Book. Marks of all experiments' write-ups and conduction are added and scaled to **10 Marks.** • The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **10 Marks.** • Open Ended Experiments are conducted after the completion of regular Experiments/Programs for 20 Marks and scaled down to **5 Marks** • Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**. • The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component. • The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks. The theory component of the IC shall be for both CIE and SEE. **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.** • The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**. • 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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

3 Credit Course – Theory	
	Note: A few of the Courses of 3 Credit are Integrated Course Type, for such courses the method suggested for 4 Credit IPCC shall be followed. **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). The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).

	A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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. **Possible continuous and comprehensive assessment:** Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Group Problem Solving, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics. The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC). **Continuous Internal Evaluation (CIE):** The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**. **Internal Assessment test:** **The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels** Three Tests each of **50 Marks** scaled down to **25 Marks** • First test after 6th week of the semester (syllabus completion of 35 – 40%) • Second test after 10th week of semester (syllabus completion of 65 – 70%) • Third test after 14th week of semester (syllabus completion of 90 – 100%) The average score of three test is taken and scaled down to **25 Marks.** **Continuous and Comprehensive Assessment (CCA):** Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**. • CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics • CCA as project-based learning, o CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission. o The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report Total score for CCA is **25 Marks** Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks** **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.** • The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student must answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**.

	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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	-	-	-	-	-	-
Understand	-	-	-	-	-	-
Apply	-	-	-	-	-	-
Analyse	-	-	-	-	-	-
Evaluate	-	-	-	-	-	-
Create	50	50	50	50	50	-

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2	Test-3			
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	50	50	-	-	-	50	33.33
CO2	-	-	50	-	-	50	33.33
CO3	-	-	-	50	50	50	33.33
CO4	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-
Total	50	50	50	50	50	150	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (in % Questions)
Remember	--
Understand	--
Apply	--
Analyse	--
Evaluate	--
Create	100
Note: Full marks can be awarded for computer printouts provide student answers all the questions completely	

Scheme of Evaluation for SEE

Question No.	Module	Marks
1	Module 1 or Module 2	**30**
2	Module 3	**40**
3	Module 4 or Module 5	**30**
Note: SEE marks will be reduced to 50 marks		

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	30	30	-	-	-	30	30
CO2	-	-	40	-	-	40	40
CO3	-	-	-	30	30	30	30
CO4	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-
Total	30	30	40	30	30	100	100

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	**Introduction:** Significance of Engineering drawing, Introduction to Computer Aided Drafting software, Co-ordinate system and reference planes HP, VP, RPP & LPP of 2D/3D environment.	**2**
1	**Orthographic Projections of Points, Straight Lines:** Introduction to Orthographic projections: Orthographic projections of points in 1st and 3rd quadrants	**2**
1	Orthographic projections of lines (Placed in First quadrant only)	**2**
2	**Orthographic Projections of Planes (First Angle of Projection only):** Understanding Orthographic projections of planes viz triangle, square (Placed in First quadrant only)	**2**
2	Orthographic projections of planes viz rectangle, pentagon (Placed in First quadrant only)	**2**
2	Orthographic projections of planes viz pentagon, hexagon, and circular laminae (Placed in First quadrant only)	**2**
2	Orthographic projections of planes viz pentagon, hexagon, and circular laminae (Placed in First quadrant only)	**2**
3	**Projections of Solids (First Angle of Projection only):** Orthographic projection of right regular solids (Solids Resting on HP only)	**2**
3	Prisms & Pyramids (triangle, square)	**2**
3	Prisms & Pyramids (rectangle, pentagon)	**2**
3	Prisms & Pyramids (hexagon & cylinders)	**2**
3	Cones, Cubes &Tetrahedron.	**2**
3	Development of Solid models –A Group work	**2**
4	**Isometric Projections:** Isometric scale, Isometric projection of hexahedron, right regular prisms	**2**

4	Isometric projection of hexahedron, right regular prisms	**2**
4	Isometric projection of pyramids, cylinders	**2**
4	Isometric projection of cones, spheres and combination of two simple solids	**2**
5	**Development of lateral surfaces:** Development of lateral surfaces of right regular pyramids and cones resting with base on HP only.	**2**
5	Development of their frustums and truncations.	**2**
5	Development of their frustums and truncations.	**2**
Total		**40 Hrs**

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

COMPUTER SCIENCE & ENGINEERING STREAM

Applied Science Course: ASC

1st Semester -Physics Cycle

Applied Science Course: ASC-1						
Course Code	**Title**	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23MATC11	Engineering Mathematics-1	3	2	0	0	4
23PHYS12	Applied Physics for Computer Science Stream	2	2	2	0	4

1st Semester - Chemistry Cycle

Applied Science Course: ASC-1						
Course Code	**Title**	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23MATC11	Engineering Mathematics-1	3	2	0	0	4
23CHES12	Applied Chemistry for Computer Science Stream	2	2	2	0	4

2nd Semester – Physics Cycle

Applied Science Course: ASC-2						
Course Code	**Title**	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23MATC21	Engineering Mathematics-2	3	2	0	0	4
23PHYS22	Applied Physics for Computer Science Stream	2	2	2	0	4

2nd Semester - Chemistry Cycle

Applied Science Course: ASC-2						
Course Code	**Title**	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23MATC21	Engineering Mathematics-2	3	2	0	0	4
23CHES22	Applied Chemistry for Computer Science Stream	2	2	2	0	4

Core Engineering Courses (CEC)

1st Semester - Physics Cycle

Core Engineering Courses: CEC-1						
Course Code	**Title**	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23CECV11	Introduction To Civil Engineering	3	0	0	0	3
23CECV12	Engineering Mechanics	3	0	0	0	3
23CECE13	Introduction to Electrical Engineering	2	2	0	0	3
23CECE14	Elements of Electrical Engineering	2	2	0	0	3
23CECE15	Introduction to Electronics Engineering	3	0	0	0	3
23CECE16	Basic Electronics	2	0	2	0	3
23CECM17	Introduction to Mechanical Engineering	3	0	0	0	3
23CECM18	Elements of Mechanical Engineering	3	0	0	0	3

2nd Semester – Chemistry Cycle

Core Engineering Courses: CEC-2						
Course Code	**Title**	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23CECV21	Introduction To Civil Engineering	3	0	0	0	3
23CECV22	Engineering Mechanics	3	0	0	0	3
23CECE23	Introduction to Electrical Engineering	2	2	0	0	3
23CECE24	Elements of Electrical Engineering	2	2	0	0	3
23CECE25	Introduction to Electronics Engineering	3	0	0	0	3
23CECE26	Basic Electronics	2	0	2	0	3
23CECM27	Introduction to Mechanical Engineering	3	0	0	0	3
23CECM28	Elements of Mechanical Engineering	3	0	0	0	3

Engineering Science Course: ESC

1st Semester -Physics Cycle

Engineering Science Course: ESC-1						
Course Code	**Title**	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23ESCS11	Principles of Programming using C	2	0	2	0	3
23ESCM12	Computer Aided Engineering Drawing	2	0	2	0	3

2nd Semester – Chemistry Cycle

Engineering Science Course: ESC-2						
Course Code	**Title**	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credit**
23ESCM22	Computer Aided Engineering Drawing	2	0	2	0	3

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Emerging Technology Course: ETC

1st Semester -Physics Cycle

Emerging Technology Course-1 : ETC-1						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credit**
23ETCV11	Smart Materials and Systems	3	0	0	0	3
23ETCE12	Introduction to Embedded Systems	2	0	2	0	3
23ETCS13	Introduction to IOT	2	0	0	2	3
23ETCS14	Introduction to Cyber Security	3	0	0	0	3

2nd Semester – Chemistry Cycle

Emerging Technology Course -2 : ETC -2						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23ETCV21	Smart Materials and Systems	3	0	0	0	3
23ETCE22	Introduction to Embedded Systems	2	0	2	0	3
23ETCS23	Introduction to IOT	2	0	0	2	3
23ETCS24	Introduction to Cyber Security	3	0	0	0	3

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Programming Language Courses: PLC

1st Semester -Physics Cycle

Programming Language Courses: PLC-1						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23PLCS11	Introduction to Python Programming	2	0	2	0	3
23PLCS12	Basics of Java Programming	2	0	2	0	3
23PLCS13	Object Oriented Programming using C++	2	0	2	0	3

1st Semester – Chemistry Cycle

Programming Language Courses: PLC -1						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23PLCS11	Introduction to Python Programming	2	0	2	0	3
23PLCS12	Basics of Java Programming	2	0	2	0	3
23PLCS13	Object Oriented Programming using C++	2	0	2	0	3

2nd Semester -Physics Cycle

Programming Language Courses: PLC -2						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23PLCS21	Introduction to Python Programming	2	0	2	0	3
23PLCS22	Basics of Java Programming	2	0	2	0	3
23PLCS23	Object Oriented Programming using C++	2	0	2	0	3

2nd Semester – Chemistry Cycle

Programming Language Courses: PLC-2						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23PLCS21	Introduction to Python Programming	2	0	2	0	3
23PLCS22	Basics of Java Programming	2	0	2	0	3
23PLCS23	Object Oriented Programming using C++	2	0	2	0	3

Ability Enhancement Course (AEC) / Skill Development Course (SDC)

1st Semester Physics Cycle & Chemistry Cycle

Humanity and Social Science Course: HSSC						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23IDTC18	Innovation Design & Thinking	1	0	0	0	1

2nd Semester Physics Cycle & Chemistry Cycle

Humanity and Social Science Course: HSSC						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23EEXC28	Engineering Exploration	1	0	0	0	1

Humanity and Social Science Course: HSSC

1st Semester Physics Cycle

Humanity and Social Science Course: HSSC						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23CENC16	Communicative English	1	0	0	0	1
23ICNC17	Indian Constitution	1	0	0	0	1

1st Semester Chemistry Cycle

Humanity and Social Science Course: HSSC						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23CENC16	Communicative English	1	0	0	0	1
23SBKC17	Samskruthika Kannada	1	0	0	0	1

2nd Semester Physics Cycle

Humanity and Social Science Course: HSSC						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23CENC26	Professional writing skills in English	1	0	0	0	1
23ICNC27	Indian Constitution	1	0	0	0	1

2nd Semester Chemistry Cycle

Humanity and Social Science Course: HSSC						
	Title	**Lecture**	**Tutorial**	**Practical**	**Project**	**Credits**
23CENC26	Professional writing skills in English	1	0	0	0	1
23SBKC27	Samskruthika Kannada	1	0	0	0	1

- The student has to select one course from the Core Engineering Course (CEC) group.
- The students have to opt for the courses from CEC group without repeating the course in either 1st or 2nd semester
- The students must select one course from either ETC-I or PLC-I group.
- 23ESCS11(Principles of Programming using C) course is mandatory in First Semester

Scheme of Teaching and Examinations – 2023
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2023-24)

1st SEMESTER: PHYSICS CYCLE (Computer Science Stream) – Computer Science & Engineering (CSE)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC11	Engineering Mathematics-1	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23PHYS12	Applied Physics for Computer Science Stream	ASC	PHY	PHY	2	2	2	0	6	4	3	50	50	100
3	23CECE15	Introduction to Electronics Engineering	CEC-1	ECE	ECE	3	0	0	0	3	3	3	50	50	100
4	23ESCS11	Principles of Programming using C	ESC	ISE	CSE	2	0	2	0	4	3	3	50	50	100
5	23ETCS14	Introduction to Cyber Security	ETC	CSE(AI)	CSE	2	0	0	2	4	3	3	50	50	100
6	23CENC16	Communicative English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23ICNC17	Indian Constitution	HSSC	MED	MED	1	0	0	0	1	1	2	50	50	100
8	23IDTC18	Innovation and Design Thinking	AEC/SDC	ALD	ALD	1	0	0	0	1	1	2	50	50	100
					Total	**15**	**4**	**4**	**2**	**25**	**20**	**21**	**400**	**400**	**800**

2nd SEMESTER: CHEMISTRTY CYCLE (Computer Science Stream) – Computer Science & Engineering (CSE)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC21	Engineering Mathematics-2	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23CHES22	Applied Chemistry for Computer Science Stream	ASC	CHE	CHE	2	2	2	0	6	4	3	50	50	100
3	23CECE23	Introduction to Electrical Engineering	CEC-2	EEE	EEE	2	2	0	0	4	3	3	50	50	100
4	23ESCM22	Computer Aided Engineering Drawing	ESC	MED	MED	2	0	2	0	4	3	3	50	50	100
5	23PLCS23	Object Oriented Programming using C++	PLC	CSE	CSE	2	0	2	0	4	3	3	50	50	100
6	23CENC26	Professional writing skills in English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23SBKC27	Samskruthika Kannada	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
8	23EEXC28	Engineering Exploration	AEC/SDC	ALD	ALD	0	0	0	2	2	1	2	50	50	100
					Total	**13**	**6**	**6**	**2**	**27**	**20**	**21**	**400**	**400**	**800**

Scheme of Teaching and Examinations – 2023
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2023-24)

1st SEMESTER: PHYSICS CYCLE (Computer Science Stream) – Computer Science & Engineering (Data Science)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC11	Engineering Mathematics-1	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23PHYS12	Applied Physics for Computer Science Stream	ASC	PHY	PHY	2	2	2	0	6	4	3	50	50	100
3	23CECE15	Introduction to Electronics Engineering	CEC-1	ECE	ECE	3	0	0	0	3	3	3	50	50	100
4	23ESCS11	Principles of Programming using C	ESC	ISE	CSE(DS)	2	0	2	0	4	3	3	50	50	100
5	23ETCS14	Introduction to Cyber Security	ETC	CSE(AI)	CSE (DS)	2	0	0	2	4	3	3	50	50	100
6	23CENC16	Communicative English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23ICNC17	Indian Constitution	HSSC	MED	MED	1	0	0	0	1	1	2	50	50	100
8	23IDTC18	Innovation Design Thinking	AEC/SDC	ALD	ALD	1	0	0	0	1	1	2	50	50	100
					Total	**15**	**4**	**4**	**2**	**25**	**20**	**21**	**400**	**400**	**800**

2nd SEMESTER: CHEMISTRTY CYCLE (Computer Science Stream) – Computer Science & Engineering (Data Science)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC21	Engineering Mathematics-2	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23CHES22	Applied Chemistry for Computer Science Stream	ASC	CHE	CHE	2	2	2	0	6	4	3	50	50	100
3	23CECM27	Introduction to Mechanical Engineering	CEC-2	MED	MED	3	0	0	0	3	3	3	50	50	100
4	23ESCM22	Computer Aided Engineering Drawing	ESC	MED	MED	2	0	2	0	4	3	3	50	50	100
5	23PLCS21	Introduction to Python Programming	PLC	ISE	CSE(DS)	2	0	2	0	4	3	3	50	50	100
6	23CENC26	Professional writing skills in English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23SBKC27	Samskruthika Kannada	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
8	23EEXC28	Engineering Exploration	AEC/SDC	ALD	ALD	0	0	0	2	2	1	2	50	50	100
					Total	**14**	**4**	**6**	**2**	**26**	**20**	**21**	**400**	**400**	**800**

Scheme of Teaching and Examinations – 2023
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2023-24)

1st SEMESTER: PHYSICS CYCLE (Computer Science Stream) – Computer Science & Engineering (IOT & Cyber Security including Block Chain Technology)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC11	Engineering Mathematics-1	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23PHYS12	Applied Physics for Computer Science Stream	ASC	PHY	PHY	2	2	2	0	6	4	3	50	50	100
3	23CECE15	Introduction to Electronics Engineering	CEC-1	ECE	ECE	3	0	0	0	3	3	3	50	50	100
4	23ESCS11	Principles of Programming using C	ESC	ISE	CSE (IOT)	2	0	2	0	4	3	3	50	50	100
5	23ETCS14	Introduction to Cyber Security	ETC	CSE(AI)	CSE (IOT)	2	0	0	2	4	3	3	50	50	100
6	23CENC16	Communicative English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23ICNC17	Indian Constitution	HSSC	MED	MED	1	0	0	0	1	1	2	50	50	100
8	23IDTC18	Innovation Design Thinking	AEC/SDC	ALD	ALD	1	0	0	0	1	1	2	50	50	100
					Total	**15**	**4**	**4**	**2**	**25**	**20**	**21**	**400**	**400**	**800**

2nd SEMESTER: CHEMISTRTY CYCLE (Computer Science Stream) – Computer Science & Engineering (IOT & Cyber Security including Block Chain Technology)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC21	Engineering Mathematics-2	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23CHES22	Applied Chemistry for Computer Science Stream	ASC	CHE	CHE	2	2	2	0	6	4	3	50	50	100
3	23CECM27	Introduction to Mechanical Engineering	CEC-2	MED	MED	3	0	0	0	3	3	3	50	50	100
4	23ESCM22	Computer Aided Engineering Drawing	ESC	MED	MED	2	0	2	0	4	3	3	50	50	100
5	23PLCS21	Introduction to Python Programming	PLC	ISE	CSE(IOT)	2	0	2	0	4	3	3	50	50	100
6	23CENC26	Professional writing skills in English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23SBKC27	Samskruthika Kannada	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
8	23EEXC28	Engineering Exploration	AEC/SDC	ALD	ALD	0	0	0	2	2	1	2	50	50	100
					Total	**14**	**4**	**6**	**2**	**26**	**20**	**21**	**400**	**400**	**800**

Scheme of Teaching and Examinations – 2023
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2023-24)

1st SEMESTER: PHYSICS CYCLE (Computer Science Stream) – Computer Science & Design (CSD)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC11	Engineering Mathematics-1	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23PHYS12	Applied Physics for Computer Science Stream	ASC	PHY	PHY	2	2	2	0	6	4	3	50	50	100
3	23CECE15	Introduction to Electronics Engineering	CEC-1	ECE	ECE	3	0	0	0	3	3	3	50	50	100
4	23ESCS11	Principles of Programming using C	ESC	ISE	CSD	2	0	2	0	4	3	3	50	50	100
5	23ETCS14	Introduction to Cyber Security	ETC	CSE(AI)	CSD	2	0	0	2	4	3	3	50	50	100
6	23CENC16	Communicative English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23ICNC17	Indian Constitution	HSSC	MED	MED	1	0	0	0	1	1	2	50	50	100
8	23IDTC18	Innovation Design Thinking	AEC/SDC	ALD	ALD	1	0	0	0	1	1	2	50	50	100
					Total	**15**	**4**	**4**	**2**	**25**	**20**	**21**	**400**	**400**	**800**

2nd SEMESTER: CHEMISTRTY CYCLE (Computer Science Stream) – Computer Science & Design (CSD)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC21	Engineering Mathematics-2	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23CHES22	Applied Chemistry for Computer Science Stream	ASC	CHE	CHE	2	2	2	0	6	4	3	50	50	100
3	23CECE23	Introduction to Electrical Engineering	CEC-2	EEE	EEE	2	2	0	0	4	3	3	50	50	100
4	23ESCM22	Computer Aided Engineering Drawing	ESC	MED	MED	2	0	2	0	4	3	3	50	50	100
5	23PLCS21	Introduction to Python Programming	PLC	ISE	CSD	2	0	2	0	4	3	3	50	50	100
6	23CENC26	Professional writing skills in English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23SBKC27	Samskruthika Kannada	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
8	23EEXC28	Engineering Exploration	AEC/SDC	ALD	ALD	0	0	0	2	2	1	2	50	50	100
					Total	**13**	**6**	**6**	**2**	**27**	**20**	**21**	**400**	**400**	**800**

Scheme of Teaching and Examinations – 2023
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2023-24)

1st SEMESTER: CHEMISTRTY CYCLE (Computer Science Stream) – Information Science & Engineering (ISE)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC11	Engineering Mathematics-1	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23CHES12	Applied Chemistry for Computer Science Stream	ASC	CHE	CHE	2	2	2	0	6	4	3	50	50	100
3	23CECE15	Introduction to Electronics Engineering	CEC-1	ECE	ECE	3	0	0	0	3	3	3	50	50	100
4	23ESCS11	Principles of Programming using C	ESC	ISE	ISE	2	0	2	0	4	3	3	50	50	100
5	23ESCM12	Computer Aided Engineering Drawing	ESC	MED	MED	2	0	2	0	4	3	3	50	50	100
6	23CENC16	Communicative English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23SBKC17	Samskruthika Kannada	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
8	23IDTC18	Innovation Design Thinking	AEC/SDC	ALD	ALD	1	0	0	0	1	1	2	50	50	100
					Total	**15**	**4**	**6**	**0**	**25**	**20**	**21**	**400**	**400**	**800**

2nd SEMESTER: PHYSICS CYCLE (Computer Science Stream) – – Information Science & Engineering (ISE)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC21	Engineering Mathematics-2	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23PHYS22	Applied Physics for Computer Science Stream	ASC	PHY	PHY	2	2	2	0	6	4	3	50	50	100
4	23CECV21	Introduction to Civil Engineering	CEC-2	CED	CED	3	0	0	0	3	3	3	50	50	100
3	23ETCS23	Introduction to IOT	ETC	CSE(AI)	ISE	2	0	0	2	4	3	3	50	50	100
5	23PLCS21	Introduction to Python Programming	PLC	ISE	ISE	2	0	2	0	4	3	3	50	50	100
6	23CENC26	Professional writing skills in English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23ICNC27	Indian Constitution	HSSC	MED	MED	1	0	0	0	1	1	2	50	50	100
8	23EEXC28	Engineering Exploration	AEC/SDC	ALD	ALD	0	0	0	2	2	1	2	50	50	100
					Total	**13**	**6**	**4**	**4**	**27**	**20**	**21**	**400**	**400**	**800**

Scheme of Teaching and Examinations – 2023
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2023-24)

1st SEMESTER: CHEMISTRTY CYCLE (Computer Science Stream) – Artificial Intelligence & Machine Learning (AIML)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC11	Engineering Mathematics-1	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23CHES12	Applied Chemistry for Computer Science Stream	ASC	CHE	CHE	2	2	2	0	6	4	3	50	50	100
3	23CECV11	Introduction to Civil Engineering	CEC-1	CED	CED	3	0	0	0	3	3	3	50	50	100
4	23ESCS11	Principles of Programming using C	ESC	ISE	AIML	2	0	2	0	4	3	3	50	50	100
5	23ESCM12	Computer Aided Engineering Drawing	ESC	MED	MED	2	0	2	0	4	3	3	50	50	100
6	23CENC16	Communicative English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23SBKC17	Samskruthika Kannada	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
8	23IDTC18	Innovation Design Thinking	AEC/SDC	ALD	ALD	1	0	0	0	1	1	2	50	50	100
					Total	**15**	**4**	**6**	**0**	**25**	**20**	**21**	**400**	**400**	**800**

2nd SEMESTER: PHYSICS CYCLE (Computer Science Stream) – Artificial Intelligence & Machine Learning (AIML)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC21	Engineering Mathematics-2	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23PHYS22	Applied Physics for Computer Science Stream	ASC	PHY	PHY	2	2	2	0	6	4	3	50	50	100
3	23CECE25	Introduction to Electronics Engineering	CEC-2	ECE	ECE	3	0	0	0	3	3	3	50	50	100
4	23ETCS23	Introduction to IOT	ETC	CSE(AI)	AIML	2	0	0	2	4	3	3	50	50	100
5	23PLCS22	Basics of JAVA Programming	PLC	AIML	AIML	2	0	2	0	4	3	3	50	50	100
6	23CENC26	Professional writing skills in English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23ICNC27	Indian Constitution	HSSC	MED	MED	1	0	0	0	1	1	2	50	50	100
8	23EEXC28	Engineering Exploration	AEC/SDC	ALD	ALD	0	0	0	2	2	1	2	50	50	100
					Total	**14**	**4**	**4**	**4**	**26**	**20**	**21**	**400**	**400**	**800**

Scheme of Teaching and Examinations – 2023
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2023-24)

1st SEMESTER: CHEMISTRTY CYCLE (Computer Science Stream) – Computer Science & Engineering (Artificial Intelligence)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC11	Engineering Mathematics-1	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23CHES12	Applied Chemistry for Computer Science Stream	ASC	CHE	CHE	2	2	2	0	6	4	3	50	50	100
3	23CECE15	Introduction to Electronics Engineering	CEC-1	ECE	ECE	3	0	0	0	3	3	3	50	50	100
4	23ESCS11	Principles of Programming using C	ESC	ISE	CSE(AI)	2	0	2	0	4	3	3	50	50	100
5	23ESCM12	Computer Aided Engineering Drawing	ESC	MED	MED	2	0	2	0	4	3	3	50	50	100
6	23CENC16	Communicative English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23SBKC17	Samskruthika Kannada	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
8	23IDTC18	Innovation Design Thinking	AEC/SDC	ALD	ALD	1	0	0	0	1	1	2	50	50	100
					Total	**15**	**4**	**6**	**0**	**25**	**20**	**21**	**400**	**400**	**800**

2nd SEMESTER: PHYSICS CYCLE (Computer Science Stream) – Computer Science & Engineering (Artificial Intelligence)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC21	Engineering Mathematics-2	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23PHYS22	Applied Physics for Computer Science Stream	ASC	PHY	PHY	2	2	2	0	6	4	3	50	50	100
3	23ESCV21	Introduction to Civil Engineering	CEC-2	CED	CED	3	0	0	0	3	3	3	50	50	100
4	23ETCS23	Introduction to IOT	ETC	CSE(AI)	CSE(AI)	2	0	0	2	4	3	3	50	50	100
5	23PLCS21	Introduction to Python Programming	PLC	ISE	CSE(AI)	2	0	2	0	4	3	3	50	50	100
6	23CENC26	Professional writing skills in English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23ICNC27	Indian Constitution	HSSC	MED	MED	1	0	0	0	1	1	2	50	50	100
8	23EEXC28	Engineering Exploration	AEC/SDC	ALD	ALD	0	0	0	2	2	1	2	50	50	100
					Total	**14**	**4**	**4**	**4**	**26**	**20**	**21**	**400**	**400**	**800**

Scheme of Teaching and Examinations – 2023
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2023-24)

1st SEMESTER: CHEMISTRTY CYCLE (Computer Science Stream) – Computer Science (Cyber Security)

Sl. No	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC11	Engineering Mathematics-1	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	23CHES12	Applied Chemistry for Computer Science Stream	ASC	CHE	CHE	2	2	2	0	6	4	3	50	50	100
4	23CECV11	Introduction to Civil Engineering	CEC-1	CED	CED	3	0	0	0	3	3	3	50	50	100
3	23ESCS11	Principles of Programming using C	ESC	ISE	CSE(CS)	2	0	2	0	4	3	3	50	50	100
5	23ESCM12	Computer Aided Engineering Drawing	ESC	MED	MED	2	0	2	0	4	3	3	50	50	100
6	23CENC16	Communicative English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23SBKC17	Samskruthika Kannada	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
8	23IDTC18	Innovation Design Thinking	AEC/SDC	ALD	ALD	1	0	0	0	1	1	2	50	50	100
					Total	**15**	**4**	**6**	**0**	**25**	**20**	**21**	**400**	**400**	**800**

2nd SEMESTER: PHYSICS CYCLE (Computer Science Stream) – Computer Science (Cyber Security)

Sl. No.	Course Code	Course Title	Course Category	BOS	TD	Teaching Hours/Week					Credits	Examination			
						Lecture	Tutorial	Practical	Project	Total		SEE Duration (Hrs)	CIE Marks	SEE Marks	Total Marks
						L	T	P	S						
1	23MATC21	Engineering Mathematics-2	ASC	MAT	MAT	2	2	2	0	6	4	3	50	50	100
2	23PHYS22	Applied Physics for Computer Science Stream	ASC	PHY	PHY	2	2	2	0	6	4	3	50	50	100
4	23ESCE25	Introduction to Electronics Engineering	CEC-2	ECE	ECE	3	0	0	0	3	3	3	50	50	100
3	23ETCS25	Introduction to Cyber Security	ETC	CSE(CYS)	CSE(CYS)	3	0	0	0	3	3	3	50	50	100
5	23PLCS21	Introduction to Python Programming	PLC	ISE	CSE(CYS)	2	0	2	0	4	3	3	50	50	100
6	23CENC26	Professional writing skills in English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	23ICNC27	Indian Constitution	HSSC	MED	MED	1	0	0	0	1	1	2	50	50	100
8	23EEXC28	Engineering Exploration	AEC/SDC	ALD	ALD	0	0	0	2	2	1	2	50	50	100
					Total	**15**	**4**	**6**	**2**	**27**	**20**	**21**	**400**	**400**	**800**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**2nd**				
Course Title	:	**Engineering Exploration Course**				
Course Code	:	**23EEXC28**				
Course Type (Theory/ Practical/Integrated)	:	**Practical**				
Course Category	:	**AEC/SDC**				
Stream	:	**Common to all streams**		**CIE**	:	**50 Marks**
Teaching hr/week (L: T: P:S)	:	**0:0:0:2**		**SEE**	:	**50 Marks**
Total Hours	:	**30 Hrs**		**SEE Duration**	:	**03 Hours**
Credits	:	**01**				

Course Learning Objectives: Students will be taught

Sl. No	Course Objectives
1	Introduce Students to different engineering disciplines, creative and innovative thinking, design and develop solution through brainstorming.
2	Identify required constraints and gaps, provide critical analysis, visualization, programming, hardware interfacing.
3	Involve students in experimental hands-on project-based learning using modern software tools and hardware components, with prominence on community problems in engineering domains.
4	Enable students to work in a team, collaborative learning and develop communication and presentation skills and technical report writing
5	Encourage lifelong learning and infusing interdisciplinary mindset creating social values and ethical implications of their creative work.

Teaching-Learning Process

Pedagogy (General Instructions):

These are sample Strategies which teachers can use to accelerate the attainment of the various

Course Outcomes.

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Introduction to Engineering Exploration, Workplace Readiness Skills** Engineering Projects in Community Service, Exploration and design thinking Process-Empathize, Define, Ideate, Prototype, Test. Importance of Interdisciplinary team work, effective participation in teamwork and leadership roles. critical thinking and problem-solving skills, professional work ethics, importance of project life cycle, project management, importance of communication. Embrace, Learn, and Adapt to Failure as a Way to Success.	02
Pedagogy	Understand the course objective and explore the project ideas through brainstorming.	
2	**Problem Identification, Specification Development -** Clear and measurable requirements, identifying relevant benchmarks, identifying the gap between the available and required products, requirements documentation.	02
Pedagogy	Demonstrate existing projects – video/website/hands-on **[Demonstration Phase]**	
3	**Platform Based Development**- Introduction to sensors, transducers and actuators and their usage in real time applications. Networking Fundamentals, Web Development/App Development, Nano materials – preparation methods and applications, Electric Vehicles, Robotics and Drones Platform based development -Arduino, electronic circuit simulations and programming concepts.	04
Pedagogy	Handson Session - Tinkercad, Wireshark tool, CryptTool, Kali Linux-fundamental commands, HTML, CSS commands,3D Printing Simulator Model, Altair software, Arduino IDE **[Exploration Phase]**	
4	Design and Develop Solution, Testing. Prototype—Start to Create Your Solution	20
Pedagogy	Experiential Project Based Learning **[Open Ended Phase]**	
5	Report Writing, Project Demonstration and Presentation	02
Pedagogy	Demonstration and Presentation	

List of Experiments or Programs

Sl. No	Experiments/Programs	COs
1	Write a program to Blink an LED (light emitting diode) using Arduino's digital output	CO1 CO2 CO3 CO4 CO5
2	Develop a Gas Detecting Alarm system with Arduino	
3	Create a Wikipedia page.	
4	Create an event website, Community-Based Disaster Preparedness Platform	
5	Develop a simple Calculator Application.	
6	3D printing of real structures and machines	
7	Micro magnetic simulation	
8	Basic Circuit Simulations using Pspice	
9	Affordable Housing with Sustainable Materials, Renewable Energy Microgrid for Rural Communities.	
10	Smart Water Distribution and Conservation Network, Solar-Powered Mobile Charging Stations	

Sl. No	Open Ended Phase
1	**Project Stream 1:** Electronics, Robotics, IOT and Sensors
2	**Project Stream 2:** Computer Science and IT Applications
3	**Project Stream 3:** Mechanical and Electrical tools
4	**Project Stream 4:** Eco-friendly solutions for waste management, infrastructure, safety, alternative energy sources, Agriculture, Environmental science and other fields of engineering.

Reference Books

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Exploring Engineering An Introduction to Engineering and Design 5th Edition - April 30, 2020 Authors: Robert Balmer, William Keat Paperback ISBN: 9780128150733 eBook ISBN: 9780128150740
2	Tim Brown, Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation (2009) Esra Gonen Izmir University of Economics
3	Arduino Project Handbook: Volume One: Complete Guide to Creating with the Arduino by Mark Geddes [ISBN-10 0992952603, Publisher: Sketch Publishing]
4	Exploring Arduino: Tools and Techniques for Engineering Wizardry by Jeremy Blum [ISBN-10 1119405378, Publisher: Wiley]
5	Practical Python Programming for IoT: Build advanced IoT projects using a Raspberry Pi 4, MQTT, RESTful APIs, WebSocket's, and Python 3 Paperback – Import, 15 May 2020

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Apply the domain knowledge to solve the problem statement with multidisciplinary approach.	L3	Apply
CO2	Identify the performance parameter, components, algorithm/logic/design to solve the defined real-time problem.	L4	Analyse
CO3	Design and Develop solution to the proposed problem statement and test the hypothesis wherever applicable using modern tools	L3	Apply
CO4	Analyse the result and synthesize the project findings as project report.	L4	Evaluate
CO5	Demonstrate technical skills and competency through their project with ethics, effective presentation and communication skills as an individual and in a team.	L5	Evaluate

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	2	-	-	-	-	-
CO3	-	-	3	-	3	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	2
CO5	-	-	-	-	-	2	-	2	3	3	3	2

Weblinks and Video Lectures (e-Resources)	
1	https://www.electronicsforu.com/mini-projects-ideas?utm_source=google&utm_medium=cpc&utm_campaign=Ele.com+-+traffic+Dynamic+Search+-22-12-2021&gclid=EAIaIQobChMIsf3N4bD3_wIVHAyDAx1a5wkrEAAYASAAEgJNe_D_BwE
2	https://www.mooc-list.com/tags/design-thinking?__cf_chl_tk=OiyDIM1QC0P7pJVSWWWpKKITaJH2pBsQoyI9IaeWj.U-1688552822-0-gaNycGzNC5A
3	https://www.sciencebuddies.org/science-fair-projects/engineering-design-process/engineering-design-problem-statement
4	https://www.3dsourced.com/rigid-ink/best-3d-printing-books/#3D%20Printing%20Courses
5	https://youtu.be/nE1C4ghfvac
6	https://youtu.be/ebO38bbq0_4
7	https://youtu.be/qUEbxTkPIWI
8	https://youtu.be/5zAQot4pKgU
9	https://youtu.be/QQZ6EGf0Ju8
10	https://youtu.be/UgtjRob5qMg

Assessment Pattern (both CIE and SEE)

Engineering Exploration Course								
1 Credit Courses – Project								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Project				**50**	----	----	**20**	
CIE	**Project Based Learning**	Review – 1	Module - 1 & 2	50	(50+50+50) / 3	**25**	**10**	Average of Three reviews each of 50 Marks scale down the marks to 25 Marks
		Review – 2	Module - 3 & 4	50				
		Review – 3	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**25**	**10**	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment
		CCA-2- Pedagogical Initiatives		50				

								method may be adopted
	Total CIE Project					**50**	**20**	Scale down Marks of IAT and CCA to 25
SEE		Project Based Evaluation	Entire syllabus	50	-	**50**	**18**	Writeup (10) Conduction and Results (30) Viva Voce (10), Duration 03 hours
CIE + SEE				**100**	-	-	**40**	

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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 (CIE):

The CIE will constitute of three reviews and two continuous and comprehensive assessment
The CIE Marks for the internal assessment test shall be **50 Marks each** for review 1, review 2 and review – 3 (project demo/participation in project competitions/paper publications). The scored Marks are scaled down to **25 Marks**.

The phases of evaluating the project:

- Review 1 is evaluated for 50 Marks after 5th week of the semester.
- Review 2 is evaluated for 50 Marks after 10th week of the semester.
- Review 3 is evaluated for 50 Marks after 13th week of the semester

Rubrics for Review 1:

Ideating the problem definition	20% of max. Marks
Identifying the objectives and methodology	20% of max. Marks
Design of the project	40% of max. Marks
Presentation (oral and written) and preparation of review 1 report	20% of max. Marks

Rubrics for Review 2:

Implementation of the design	40% of max. Marks
Validate the result with various scenarios	30% of max. Marks
Presentation (oral and written)	30% of max. Marks

Rubrics for Review 3:

Demonstration of the project	40% of max. Marks
Viva-voce	20% of max. Marks
Report evaluation	20% of max. Marks
Paper presentation/participation in project competitions	20% of max. Marks

Continuous and Comprehensive Assessment (CCA):

CCA1 and CCA2 are evaluated for 50 marks each.
CCA 1 is the assessment of the laboratory sessions scaled to 15 marks and CCA 2 is the quiz scaled 10 marks

	Semester End Examination (SEE): • The SEE as project exam will be conducted as per the scheduled timetable, for the **duration 03 hours.** • SEE as project work will be conducted by two examiners appointed by the chief controller, examination. SEE Marks for the project work shall be awarded using appropriate rubrics with the ratio of 50:25:25 for quality work and report, viva-voce and presentation skills

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Project					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	Review-1	Review-2	Review-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	-	-	-	-	-	-
Understand	-	-	-	-	05	-
Apply	30	10	-	20	15	-
Analyse	20	20	20	20	20	-
Evaluate	-	20	30	10	10	-
Create	-	-	-	-	-	-

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage (%)
	Review-1		Review-2		Revew-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	05	10	-	-	-	15	10
CO2	10	10	-	-	-	20	14
CO3	05	10	05	05	20	45	30
CO4	-	-	10	10	20	40	26
CO5	-	-	10	10	10	30	20
Total	20	30	25	25	50	150	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (80% Project Demonstration+20%Report)
Remember	-
Understand	-
Apply	40%

Analyse	**30%**
Evaluate	**10%**
Create	**-**

SEE Course Plan

CO's	Marks Distribution			Total Marks	Weightage
	Empathize, Define, Ideate (Writeup)	Design and Analyse the result. (Project Demo)	Report Evaluation		
CO1	05	-	10	15	30%
CO2	05	-	-	05	10%
CO3	-	15	-	15	30%
CO4	-	10	-	10	20%
CO5	-	05	-	05	10%
Total	10	30	10	50	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Engineering Projects in Community Service, Exploration and design thinking Process- Empathize, Define, Ideate, Prototype, Test. Importance of Interdisciplinary team work, effective participation in teamwork and leadership roles. critical thinking and problem-solving skills, professional work ethics, importance of project life cycle, project management, importance of communication. Embrace, Learn, and Adapt to Failure as a Way to Success.	01
1	Understand the course objective and explore the project ideas through brainstorming.	01
2	Problem Identification, Specification Development - Clear and measurable requirements, identifying relevant benchmarks, identifying the gap between the available and required products, requirements documentation.	01
2	Demonstrate existing projects – video/website/hands-on	01
3	Introduction to sensors, transducers and actuators and their usage in real time applications- Tinkercad Tool, Arduino IDE	01
3	Networking Fundamentals, Web Development/App Development	01
3	Nano materials – preparation methods and applications, Electric Vehicles	01
3	Robotics and Drones-3D Printing Simulator Model, Altair software	01
4	Design and Develop Solution, Testing. Prototype—Start to Create Your Solution	20
5	Report Writing, Project Demonstration and Presentation	02
	Total	**30**

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Semester	:	**1st**				
Course Title	:	**Engineering Mathematics - I**				
Course Code	:	**23MATC11**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Course Category	:	**ASC**				
Stream	:	**Common to all branches**		**CIE**	:	**50 Marks**
Teaching hour/week (L:T:P:S)	:	**3:2:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**50 Hrs**		**SEE Duration**	:	**3 Hours**
Credits:	:	**4**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	Acquire basic knowledge of Mathematical concepts for understanding Engineering problems
2	Use concepts of multivariate calculus, differential equations and numerical methods in solving problems
3	Analyze problems using concepts of multivariate calculus, differential equations and numerical methods
4	Analysis of various real time problems using the skills acquired

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**MODULE – I: Partial differentiation** Partial derivatives, Total derivatives-differentiation of composite functions, Maxima and minima for a function two variables, Jacobians, Hessian matrix.	10
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
2	**MODULE-II: Ordinary Differential Equations of first order** Linear Differential equation, Bernoulli's equation, exact differential equation, reducible to exact differential equation, solvable for p, Clairaut's equation, equations reducible to Clairaut's form, Newton's law of cooling- problems.	10
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
3	**MODULE-III: Ordinary Differential Equations of second and higher order** Second and higher order differential equations, inverse differential operator, Cauchy's and Legendre's differential equations, method of variation of parameters.	10
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
4	**MODULE-IV: Numerical solution of Ordinary Differential Equations** Introduction to Taylor's series, Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order, Milne's predictor and corrector method, Runge-Kutta method for second order differential equations, Milne's method for second order differential equations.	10
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
5	**MODULE-V: Partial differential equations** Formation of Partial Differential Equation, solution of PDE by direct integration, solution of Lagrange's Linear PDE, solution of one-dimensional heat and wave equations by variable separable method, solution of two-dimensional Laplace equation, numerical solution of	10

	Laplace equation using standard five-point formula, numerical solution of heat equation by Schmidt explicit formula, numerical solution of the wave equation.	
Pedagogy	**Chalk and board, group discussion, ppt, videos**	

List of Experiments or Programs

Sl.No	Experiments/Programs	COs
	NIL	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Erwin Kreyzig, "Advanced Engineering Mathematics", 10th Edition, Wiley Publications, 2018.
2	Theory and problems of Differential and integral calculus by Frank Ayres and Elliott Mendelson, Schaum's outline series, third edition, McGraw Hill publications.
3	Numerical Methods for Scientific and Engg. Computation, M K Jain, S R K Iyengar, R K Jain, 6th edition, New Age, 2012.
4	Advanced mathematics for Engineers and Scientists by Murray R Spiegel, Schaum's outline series, edition, McGraw Hill publications.

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Understand the basic concepts of multivariate calculus and differential equations	**Understand**	**L2**
CO2	Apply techniques of multivariate calculus, differential equations and numerical methods to solve Engineering Problems	**Apply**	**L3**
CO3	Analyze Engineering problems using multivariate calculus and differential equations.	**Analyse**	**L4**
CO4	Investigate problems arising in real life using the overall knowledge acquired	**Evaluate**	**L5**

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CO2	3	--	--	--	--	--	--	--	--	--	--	--	--	--
CO3	--	1	--	--	--	--	--	--	--	--	--	--	--	--
CO4	--	--	--	2	--	--	--	--	1	1	--	--	--	--

Weblinks and Video Lectures (e-Resources)	
1	https://youtube.com/playlist?list=PLKS7ZMKnbPrQukeSraYiel-cNtwscFtlQ
2	https://youtube.com/playlist?list=PLNKD1qB9ppttgKvBIC0cpPbBBLoCgLT1g
3	https://youtube.com/playlist?list=PLKS7ZMKnbPrRvROmpyKXlBRQusRx_fw_L
4	https://youtu.be/MAAXfC5nfXs
5	https://youtu.be/SrDyuEH3rHA
6	https://youtu.be/io8-qdx1gic

Assessment Pattern (both CIE and SEE)

Applied Science Courses								
4 credits - Theory								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Theory + Practical				**50**			**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module - 1 & 2	50	(50+50+50) / 3	**25**	10	Average of Three Internal test each of 50 Marks scale down the marks to 25 Marks
		Internal Assessment Test (IAT) - II	Module - 3 & 4	50				
		Internal Assessment Test (IAT) - III	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**50**	20	Scale down Marks of IAT and CCA to 50

SEE		Theory exam	Entire theory syllabus including questions from lab component	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	
				• The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component. • The Laboratory Component for the IPCC shall be for CIE only. • However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.				

The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:
Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.
The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):
The CIE Marks for the theory component of the IC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IC
Internal Assessment test:

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks** scaled down to **25 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **15 Marks.**

Continuous and Comprehensive Assessment (CCA):
Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**

	Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks** **CIE for the practical component of the IC** • On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **10 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester and **5 Marks** for conducting Open Ended Experiments. • The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks conduction(Observation Book) and 5 Marks for Record Book. Marks of all experiments' write-ups and conduction are added and scaled to **10 Marks.** • The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **10 Marks.** • Open Ended Experiments are conducted after the completion of regular Experiments/Programs for 20 Marks and scaled down to **5 Marks** • Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**. • The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component. • The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks. The theory component of the IC shall be for both CIE and SEE. **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)** • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. The duration of SEE is 03 hours. • The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**. • 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. The two questions should be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	--	--	--	30	--	--
Understand	10	10	10	20	--	--
Apply	30	30	30	--	--	--
Analyse	10	10	10	--	--	--
Evaluate	--	--	--	--	50	--
Create	--	--	--	--	--	--

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	5	5	5	5	10	30	20%
CO2	15	15	15	15	30	90	60%
CO3	5	5	5	5	10	30	20%
CO4	--	--	--	--	--	--	--
CO5	--	--	--	--	--	--	--
CO6	--	--	--	--	--	--	--
Total	25	25	25	25	50	150	

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	--
Understand	5
Apply	35
Analyse	10
Evaluate	--
Create	--

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	5	--	--	--	--	5	10%
CO2	5	5	10	5	10	35	70%
CO3	--	5	--	5	--	10	20%
CO4	--	--	--	--	--	--	--
CO5	--	--	--	--	--	--	--
CO6	--	--	--	--	--	--	--
Total	10	10	10	10	10	50	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Partial derivatives- Definition and problems	1
1	Problems continued on above	1
1	Total Derivatives- problems	1
1	Partial Differentiation of Composite functions	1
1	Problems continued on above	1
1	Jacobians – Definition and problems	1
1	Problems on Implicit functions	1
1	Maxima and Minima for a function of two variables	1
1	Problems continued on above	1
1	Hessian matrix and problems	1
2	Linear differential equations of first order and first degree and problems	1
2	Problems continued on the above	1
2	Bernoulli's equation and problems	1
2	Exact equations and reducible to exact	1
2	Problems continued on the above	1
2	Equations solvable for p	1
2	Problems continued on the above	1
2	Clairaut's equation and problems	1
2	Equations reducible to Clairaut's form	1
2	Newton's law of cooling and problems	1
3	Second and higher order differential equations	1
3	Problems continued on the above	1
3	Problems continued on the above	1
3	Inverse differential operator, three types	1
3	Problems continued on the above	1
3	Problems continued on the above	1

3	Problems continued on the above	**1**
3	Cauchy's differential equation and problems	**1**
3	Legendre's differential equation and problems	**1**
3	Method of variation of parameters	**1**
4	Formation of PDE	**1**
4	Method of elimination of arbitrary constants and functions	**1**
4	Solution of PDE by direct integration	**1**
4	Solution of Lagrange's linear PDE and problems	**1**
4	Solution of one-dimensional heat equation	**1**
4	Solution of one-dimensional wave equation	**1**
4	Solution of two-dimensional Laplace equation	**1**
4	Numerical solution of Laplace equation	**1**
4	Numerical solution of heat equation	**1**
4	Numerical solution of wave equation	**1**
5	Introduction to Taylor's series	**1**
5	Numerical solution of ODE by Taylor's series method	**1**
5	Modified Euler's method and problems	**1**
5	Problems continued on the above	**1**
5	Runge-Kutta method of fourth order	**1**
5	Problems continued on the above	**1**
5	Milne's predictor and corrector method and problems	**1**
5	Runge-Kutta method for second order differential equations	**1**
5	Problems continued on the above	**1**
5	Milne's method for second order differential equations	**1**
	Total	**50 Hrs**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	**:**	**1st**				
Course Title	**:**	**Indian Constitution**				
Course Code	**:**	**23ICNC17**				
Course Type (Theory/ Practical/ Integrated)	**:**	**Theory**				
Course Category	**:**	**HSSC**				
Stream	**:**	**Common to all**		**CIE**	**:**	**50 Marks**
Teaching hours/ week (L:T:P:S)	**:**	**1:0:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**15 Hrs**		**SEE Duration**	**:**	**2 Hours**
Credits	**:**	**01**				

Course Learning Objectives: Students will be taught

Sl. No	Course Objectives
1	To know about the basic structure of Indian Constitution.
2	To know the Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.
3	To know about our Union Government, political structure & codes, procedures.
4	To know the State Executive & Elections system of India.
5	To learn about Amendments, Emergency Provisions and other important provisions given by the constitution.

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	Introduction to the Indian constitution, importance of Indian Constitution, drafting of the Constitution, Salient features of India Constitution. Preamble of Indian Constitution, structure of the Indian Constitution	03
Pedagogy	Direct instructional method (Low/Old Technology) Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students	
2	Fundamental Rights (FR's) and its Restriction and limitations, Directive Principles of State Policy (DPSP's) and its present relevance in Indian society, Fundamental Duties and its Scope and significance in Nation	03
Pedagogy	Flipped classrooms (High/advanced Technological tools) Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students	
3	Union Executive: Parliamentary System, Union Executive – President, Prime Minister, Union Cabinet, Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Judicial System of India, Supreme Court of India, Judges of Supreme Court	03
Pedagogy	Blended learning (Combination of Low/Old Technology and High/advanced Technological tools) Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students	
4	State Executive: State Legislature System, State Executive – Governor, Chief Minister, State Cabinet, State Legislature – Vidhana Sabha and Vidhana Parishad, Judicial System of state, High Court of State, Judges of High Court	03
Pedagogy	Enquiry and evaluation-based learning Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students	

5	Election Commission of India, Elections & Electoral Process, Emergency Provisions, types of emergencies, effects of emergency, Amendment to Constitution, and Important Constitutional Amendments till today, Special Provisions for certain classes.	**03**
Pedagogy	Personalized learning Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	"Constitution of India" (for Competitive Exams) - Published by Naidhruva Edutech Learning Solutions, Bengaluru. – 2022.
2	"Introduction to the Constitution of India", (Students Edition.) by Durga Das Basu (DD Basu): Prentice –Hall, 2008.
3	"Constitution of India, Professional Ethics and Human Rights" by Shubham Singles, Charles E. Haries, and et al: published by Cengage Learning India, Latest Edition – 2019.
4	"The Constitution of India" by Merunandan K B: published by Merugu Publication, Second Edition, Bengaluru.
5	"Samvidhana Odu" - for Students & Youths by Justice HN Nagamohan Dhas, Sahayana, kerekon.

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

CO	**Course Outcomes**	**RBT Level**	**Level Indicator**
CO1	Understand the making of the constitution, its structure and Functioning	Understand	L2
CO2	Understand the importance of Fundamental Rights (FR's), Directive Principles of State Policy (DPSP's) and Fundamental Duties.	Understand	L2
CO3	Understand the structure and functioning of Union Executive	Understand	L2
CO4	Understand the structure and functioning of State Executive	Understand	L2
CO5	Understand the importance of Election Commission of India, Emergency Provisions, Amendment to Constitution, and Special Provisions under the constitution of India.	Understand	L2

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	--	--	--	--	--	3	--	--	--	--	--	--	--	--
CO2	--	--	--	--	--	3	--	--	--	--	--	--	--	--
CO3	--	--	--	--	--	3	--	--	--	--	--	--	--	--
CO4	--	--	--	--	--	3	--	--	--	--	--	--	--	--
CO5	--	--	--	--	--	3	--	--	--	--	--	--	--	--

Weblinks and Video Lectures (e-Resources)	
1	https://archive.nptel.ac.in/courses/129/106/129106003/
2	https://web.iitd.ac.in/~burra/teaching/burra19aud-lectures-contents.pdf

Assessment Pattern (both CIE and SEE)

Constitution of India / Samskruthika Kannada / Communicative English / Professional writing skills in English/ Innovation Design & Thinking								
1 Credit Courses – Theory								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Theory				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) – I (MCQ)	Module - 1 & 2	50	(50+50+50) / 3	**25**	10	Average of Three Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) – II (MCQ)	Module - 3 & 4	50				
		Internal Assessment Test (IAT) – III (QUIZ)	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**50**	20	Scale down Marks of IAT and CCA to 50

SEE		Theory exam – (MCQ Type)	Entire syllabus	50	----	50	18	SEE Exam is theory Exam with MCQ type Question Papers of 50 Questions with each question 1 Mark each. Examination duration is 1 Hour
CIE + SEE				100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

1 Credit Course - Theory	
	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). The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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. **Possible continuous and comprehensive assessment:** Crossword, Maize, Debate, Role Play, Community Service, Mind Map, Concept Map, Case Study, Group Discussions, Ideathon The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC). **Continuous Internal Evaluation (CIE):** The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**. **Internal Assessment test:** **The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels** Three Tests (MCQ) each of **50 Marks** • First test after 6th week of the semester (syllabus completion of 35 – 40%) • Second test after 10th week of semester (syllabus completion of 65 – 70%) • Third test after 14th week of semester (syllabus completion of 90 – 100%) The average score of three test is taken and scaled down to **25 Marks.** **Continuous and Comprehensive Assessment (CCA):** Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**. • CCA1 to be conducted after 4th week • CCA2 to be conducted after 9th week. • The evaluation of CCAs includes either through quiz or rubrics Total score for CCA is **25 Marks** Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks** **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject . • The question paper shall be set for 50 Marks. The medium of the question paper shall be English. **The duration of SEE is 01 hours.** • The question paper will have 50 MCQs **covering all modules**. The questions shall map with the course outcome, program outcome and Blooms RBT level.

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	-	-	-	-	-	-
Understand	50	50	50	50	50	-
Apply	-	-	-	-	-	-
Analyse	-	-	-	-	-	-
Evaluate	-	-	-	-	-	-
Create	-	-	-	-	-	-

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	-	-	-	-	-	-	-
CO2	25	25	25	25	50	150	100
CO3	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-
Total	25	25	25	25	50	150	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	--
Understand	50
Apply	--
Analyse	--
Evaluate	--
Create	--

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	10	--	--	--	--	10	20%
CO2	--	10	--	--	--	10	20%
CO3	--	--	10	--	--	10	20%
CO4	--	--	--	10	--	10	20%
CO5	--	--	--	--	10	10	20%
Total	10	10	10	10	10	50	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Introduction to the Indian constitution, importance of Indian Constitution	1
1	Drafting of the Constitution, Salient features of India Constitution	1
1	Preamble of Indian Constitution, structure of the Indian Constitution	1
2	Fundamental Rights (FR's) and its Restriction and limitations,	1
2	Directive Principles of State Policy (DPSP's) and its present relevance in Indian society	1
2	Fundamental Duties and its Scope and significance in Nation	1
3	Union Executive: Parliamentary System, Union Executive – President, Prime Minister, Union Cabinet	1
3	Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies	1
3	Judicial System of India, Supreme Court of India, Judges of Supreme Court	1
4	State Executive: State Legislature System, State Executive – Governor, Chief Minister, State Cabinet	1
4	State Legislature – Vidhana Sabha and Vidhana Parishad	1
4	Judicial System of state, High Court of State, Judges of High Court	1
5	Election Commission of India, Elections & Electoral Process	1
5	Emergency Provisions, types of emergencies, effects of emergency	1
5	Amendment to Constitution, and Important Constitutional Amendments till today, Special Provisions for certain classes.	1
	Total	**15 Hrs**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**1st**				
Course Title	:	**INNOVATION and DESIGN THINKING**				
Course Code	:	**23IDTC18**				
Course Type (Theory/Practical/Integrated)	:	**Theory**				
Course Category	:	**AEC/SDC**				
Stream	:	**Common to all Branches**		**CIE**	:	**50 Marks**
Teaching hours/ week (L:T:P:S)	:	**1:0:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**15 Hrs T**		**SEE Duration**	:	**01 Hour**
Credits	:	**01**				

Course Learning Objectives: Students will be taught

CLO's	Course Objectives
CLO1	Inculcate the fundamental concepts of design thinking.
CLO2	Enable students as a good designer by imparting creativity and problem-solving ability.
CLO3	Involve students to conceive, conceptualize, design and demonstrate their innovative ideas.
CLO4	Emphasize project-based learning for real time applications.

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24

Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	Design process: Traditional design, Design thinking, Existing sample design projects, Study on designs around us, Compositions/structure of a design, Innovative design: Breaking of patterns, reframe existing design problems, Principles of creativity Empathy: Customer Needs, Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping	3
Pedagogy	Lecture: Introduction to design thinking process. Presentation and Videos.	
2	Idea generation and Conceptualization: Visual thinking, Drawing/sketching, new concept thinking, Concept Generation Methodologies, Concept Selection, Concept Testing, Opportunity identification, Empathy for design – Collaboration in distributed Design	3
Pedagogy	Ideate the problem and analysis through Journey mapping, customer mapping	
3	**Analyze Phase: 5-Whys and 1How** Recognize the difference between symptoms and root cause, overcoming common challenges during "5Whys" process. Understanding the purpose "1How" technique. Connecting 1How to the insights from the 5Whys analysis. Creating a problem-solving framework using both techniques, align problem solving with user needs and empathy	3
Pedagogy	Group Activity: Conducting a collaborative activity "5Whys Analysis" on the Identified problem. Brainstorming potential solution using "1How" approach.	
4	**Project Management Fundamentals and Prototyping** Project management terms, Approaches: Waterfall, Agile, Hybrid. Roles and Responsibilities and competencies of project manager, phases of project-Initiate and plan, execute, close. Rapid prototyping, Strategy and Organization – Business Model design.	3
Pedagogy	Design a solution combining insights from "5Whys and 1How" technique and project Canva for the identified problem.	
5	**Finding Solution Through IDEATION** Apply ideation, critical thinking and problem-solving skills, to real-world problems and overcome barriers and find innovative solutions.	3
Pedagogy	Presentation by Team	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	John.R.Karsnitz, Stephen O'Brien and John P. Hutchinson, "Engineering Design", Cengage learning (International edition) Second Edition, 2013.
2	Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage",Harvard Business Press , 2009.
3	Idris Mootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013
4	Yousef Haik and Tamer M.Shahin, "Engineering Design Process", Cengage Learning, Second Edition, 2011..
5	Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers..
6	Gavin Ambrose, Paul Harris, "Basics Design - 8: Design Thinking", illustrated, reprint, AVA Publishing, 2010
7	Christian Müller-Roterberg, "Handbook of Design Thinking", Kindle Direct Publishing ISBN: 978-1790435371, November 2018
8	Stuart Pugh, Total Design: Integrated Methods for Successful Product Engineering, Bjarki Hallgrimsson, Prototyping and model making for product design, 2012, Laurence King Publishing Ltd.
9	Kevin Henry, Drawing for Product designers, 2012, Laurence King Publishing Ltd

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Understand the different methods employed in design thinking and establish a framework to use in their practices	**Understand**	**L2**
CO2	Apply the different steps of design thinking to ideate the problem.	**Apply**	**L3**
CO3	Develop creative solution using the tools/model-based approach and strategies of design thinking.	**Apply**	**L3**
CO4	Analyse and validate the devised solution for real time problem	**Analyse**	**L4**

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	**-**	**3**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**-**
CO3	**-**	**-**	**3**	**-**	**2**	**-**	**-**	**-**	**2**	**-**	**-**	**-**
CO4	**-**	**-**	**-**	**3**	**-**	**2**	**2**	**-**	**-**	**2**	**2**	**2**

Weblinks and Video Lectures (e-Resources)	
1	What is design thinking, Daylight design firm https://www.youtube.com/watch?v=Ee4CKIPklik&list=PLo2Y_6-IlgFXbyOjTcTg_IJQ0fZghjjQw&index=3
2	Design thinking, 3 major stages HBR https://www.youtube.com/watch?v=z3IbHLfcyWo&list=PLo2Y_6-IlgFXbyOjTcTg_IJQ0fZghjjQw&index=23
3	The Importance of Empathy https://www.youtube.com/watch?v=UzPMMSKfKZQ&list=PLo2Y_6-IlgFXbyOjTcTg_IJQ0fZghjjQw&index=21
4	How to create a customer journey map https://www.youtube.com/watch?v=mSxpVRo3BLg&list=PLo2Y_6-IlgFXbyOjTcTg_IJQ0fZghjjQw&index=6
5	Personas - Design Thinking Book https://www.youtube.com/watch?v=W1kw5xK1C30&list=PLo2Y_6-IlgFXbyOjTcTg_IJQ0fZghjjQw&index=8
6	How to build your creative confidence, David Kelley https://www.youtube.com/watch?v=16p9YRF0l-g&list=PLo2Y_6-IlgFXbyOjTcTg_IJQ0fZghjjQw&index=20
7	Apply Design Thinking in Your Work https://www.youtube.com/watch?v=U499U4TcyY8&list=PLo2Y_6-IlgFXbyOjTcTg_IJQ0fZghjjQw&index=4
8	Brainstorming https://www.mindtools.com/acv0de1/brainstorming
9	Design Thinking 101 https://www.nngroup.com/articles/design-thinking/
10	The 5 Stages in the Design Thinking Process https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process
11	Tools for taking action https://dschool.stanford.edu/resources
12	Design Thinking - A Primer https://onlinecourses.nptel.ac.in/noc19_mg60/preview

Assessment Pattern (both CIE and SEE)

Constitution of India / Samskruthika Kannada / Communicative English / Professional writing skills in English/Innovation and Design Thinking

1 Credit Courses – Theory

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) – I (MCQ)	Module - 1 & 2	50	(50+50+50) / 3	**25**	10	Average of Three Internal test each of 50 Marks scale down the marks to 25 Marks
		Internal Assessment Test (IAT) – II (MCQ)	Module - 3 & 4	50				
		Internal Assessment Test (IAT) – III (MCQ)	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				

	Total CIE Theory					**50**	20	Scale down Marks of IAT and CCA to 25
SEE		Theory exam – (MCQ Type)	Entire syllabus	50	----	50	18	SEE Exam is theory Exam with MCQ type Question Papers of 50 Questions with each question 1 Mark each. Examination duration is 1 Hour
CIE + SEE				100	----	----	40	

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:
Crossword, Maize, Debate, Role Play, Community Service, Mind Map, Concept Map, Case Study, Group Discussions, Ideathon
The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):
The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**.

Internal Assessment test:
The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests (MCQ) each of **50 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of two test is taken and scaled down to **25 Marks.**

Continuous and Comprehensive Assessment (CCA):
Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**.

- CCA1 to be conducted after 4th week
- CCA2 to be conducted after 9th week.
- The evaluation of CCAs includes either through quiz or rubrics

Total score for CCA is **25 Marks**
Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks**

Semester End Examination (SEE):

- Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject
- The question paper shall be set for 50 Marks. The medium of the question paper shall be English. The duration of SEE is 01 hours.
  The question paper will have 50 MCQs **covering all modules**. The questions should map with the course outcome, program outcome and Blooms RBT level.

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	-	-	-	-	-	-
Understand	20	20	10	20	-	-
Apply	30	30	20	20	20	-
Analyse	-	-	20	10	20	-
Evaluate	-	-	-	-	10	-
Create	-	-	-	-	-	-

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage (%)
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	10	10	10	10	10	50	33
CO2	10	10	10	10	10	50	33
CO3	-	10	-	10	10	30	20
CO4	-	-	-	-	20	20	14
Total	20	30	20	30	50	150	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (100% Theory)
Remember	-
Understand	20%
Apply	60%
Analyse	20%
Evaluate	-
Create	-

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage (%)
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	05	-	05	-	-	10	20
CO2	05	05	05	-	-	15	30
CO3	-	05	-	05	05	15	30
CO4	-	-	-	05	05	10	20
Total	10	10	10	10	10	50	100

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Design process: Traditional design, Design thinking, Existing sample design projects, Study on designs around us, Compositions/structure of a design.	1
1	Innovative design: Breaking of patterns, reframe existing design problems, Principles of creativity Empathy.	1
1	Customer Needs, Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping	1
2	Idea generation and Conceptualization: Visual thinking, Drawing/sketching, new concept thinking.	1
2	Patents and Intellectual Property, Concept Generation Methodologies.	1
2	Concept Selection, Concept Testing, Opportunity identification, Empathy for design – Collaboration in distributed Design	1
3	**Analyze Phase: 5-Whys and 1How** Recognize the difference between symptoms and root cause, overcoming common challenges during "5Whys" process.	1
3	Understanding the purpose "1How" technique. Connecting 1How to the insights from the 5Whys analysis.	1
3	Creating a problem-solving framework using both techniques, align problem solving with user needs and empathy	1
4	**Project Management Fundamentals and Prototyping** Project management terms, Approaches: Waterfall, Agile, Hybrid.	1
4	Roles and Responsibilities and competencies of project manager, phases of project-Initiate and plan, execute, close.	1
4	Rapid prototyping, Strategy and Organization – Business Model design..	1
5	**Finding Solution Through IDEATION** Apply ideation, critical thinking and problem-solving skills, to real-world problems and overcome barriers and find innovative solutions.	3
	Total	**15 Hrs**

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Semester	:	**1ST**				
Course Title	:	**Introduction To Civil Engineering**				
Course Code	:	**23CECV11**				
Course Type (Theory/Practical/Integrated)	:	**Theory**				
Course Category	:	**CEC-1**				
Stream	:	**For Non Civil Stream**		**CIE**	:	**50 Marks**
Teaching hour/week (L: T:P:S)	:	**2:2:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**40 Hrs**		**SEE Duration**	:	**3 Hours**
Credits	:	**3**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	**To Make students know the scope of various specializations of civil engineering**
2	**To Develop students' ability to analyse the problems involving forces, moments with their applications in real term on site.**
3	**To Create awareness about Environment, and Built Environment**
4	**To Appraise the knowledge about Geotechnical, Transportation, Construction and Unique Areas of Civil Engineering**

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type ofteaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in theprinciple.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes criticalthinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, developthinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come upwith their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helpsimprove the students' understanding.

9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**[A] Introduction to Civil Engineering:** Surveying, Structural Engineering, Geotechnical Engineering, Hydraulics & Water Resources, Transportation Engineering, Environmental Engineering, Construction planning & Project management. **[B]Basic Materials of Construction**: Bricks, Cement & mortars, Plain, Reinforced & Pre-stressed Concrete, Structural steel, Construction Chemicals. **[C] Structural elements of a building: F**oundation, plinth, lintel, chejja, Masonry wall, column, beam, slab and staircase, Plinth area, carpet area, floor area ratio, numerical problems, local building bye laws.	08
Pedagogy	**Model Presentation for practical understanding: PPT reflecting all the verticals & their scope**	
2	**Analysis of force systems:** Concept of idealization, system of forces, principles of superposition and transmissibility, Resolution and composition of forces, Law of Parallelogram of forces, Resultant of concurrent and non-concurrent coplanar force systems, moment of forces, couple, Varignon's theorem, free body diagram, equations of equilibrium, equilibrium of concurrent and non-concurrent coplanar forces systems.	08
Pedagogy	**Chalk & Talk: Tutorial class for typical Problem solving**	
3	**Environment**: Water Supply and Sanitary systems, urban air pollution management, Solid waste management, identification of Landfill sites, urban flood control **Built-environment:** Energy efficient buildings, recycling, Temperature and Sound control in buildings, Security systems; Smart buildings	08
Pedagogy	**Group discussions- on importance of Energy efficient bidgs; Role play for Waste mgmt.**	
4	**Geo-technical Engineering:** Origin and formation of soil, Foundations-Importance, Types, and Factors to be considered in selection of foundations. Construction Technology : Prefabricated Structures, Construction Management principles and application, Drone Survey in construction	08
Pedagogy	**Site visit to show difference between conventional & PEB; PPT having foundation types & selection criteria**	

5	**Transportation Engineering:** Importance and classification of roads and railways, types of highway pavements and its functions. Concepts of Multimodal transportation system- relevance and integration. **Unique Areas:** Concepts of Automation and Robotics in Construction, Concept of Sustainability in Civil Engineering, Introduction to sustainable development goals, Concept of Smart, Clean and Safe city.	08
Pedagogy	**Chalk & Talk, Video presentation on Multi modal transit system: PPT showing concept of smart city, characteristics, considerations & Limitations**	

List of Experiments or Programs:

Sl.No	Experiments/Programs	COs
1	Nil	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	***Basic Civil Engineering & Engineering Mechanics***: BansalR.K., Rakesh Ranjan Beohar and Ahmad Ali Khan, Laxmi Publications 2015:
2	***Mechanics for Engineers, Statics and Dynamics***: Beer F. P.and Johnston E.R., Mc Graw Hill. 1987:
3	***Engineering Mechanics***: Irving H. Shames, Prentice-Hall, 2019:
4	***Elements of Civil Engineering and Engineering Mechanics***: Kolhapure B K, EBPB, 2014:
5	***Engineering Mechanics: Principles of Statics and Dynamics***: Hibbler R.C**.,** Pearson Press , 2017:
6.	***Engineering Mechanics***, Timoshenko S, Young D.H., Rao J.V. PearsonPress, 5th Edition- 2017:

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Identify the various disciplines of civil engineering; Materials and Elements of Building, construction Bye-Laws	U	L2
CO2	Interpret the concepts and Importance of Environmental, Transportation, Geotechnical, Construction Technology concepts in construction industry.	A	L3
CO3	Analyse the Resultant of Force systems and Resolution of Force	An	L4
CO4	Evaluate modern construction technique that opens a project for public use in short span of starting; Role of advanced techniques like;Drone survey, construction project management …etc..:	C	L5
CO5	Judging the existing Civil Engineering infrastructure works; Assessing the concept of Clean, Green, Safe & thus a smart city in maintaining sustainable Ecosystem, part of Civil engineering profession	E	L6

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	--	--	--	--	1	--	--	--	--	--	--	--	--
CO2	3	2	--	--	--	1	1	--	--	--	--	--	--	--
CO3	1	3	2	1	--	--		1	--	--	--	--	--	--
CO4	--	1	2	--	1	--	1	2	1	1	--	1	1	1
CO5	--	1	1	2	--	--	--	1	1	1	1	1	1	1

Weblinks and Video Lectures (e-Resources):

1	https://www.youtube.com/watch?v=nGfVTNfNwnk&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT
2	https://www.youtube.com/watch?v=ljDIIMvxeg&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=5
3	https://www.youtube.com/watch?v=3YBXteL-qY4
4	https://www.youtube.com/watch?v=lheoBL2QaqU&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=7
5	https://www.youtube.com/watch?v=z95UW4wwzSc&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=10
6	https://www.youtube.com/watch?v=ksmsp9OzAsI
7	https://www.youtube.com/watch?v=Zrc_gB1YYS0
8	https://play.google.com/store/apps/details?id=vn.edu.best4u.com.bieudonoiluc
9	https://play.google.com/store/apps/details?id=com.teobou

Engineering Science Course (ESC) / Emerging Technology Course (ETC) / Programming Language Course (PLC)

3 Credits & 2 Credits Courses – Theory (if Integrated)

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module - 1 & 2	50	(50+50+50) / 3	**15**	6	Average of Three Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module - 3 & 4	50				
		Internal Assessment Test (IAT) - III	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25

CIE	**Practical**	Conduction of Experiments	Continuous Evaluation of each experiment			Average of all Experiments	10	4	Performance of the Experiment (On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. 20 marks are for conducting the experiment and calculations/observations/output)
			Record	05	10				
			Observation book	05					
		Practical Test	Write up	15	50	----	10	4	One Internal Practical Test after conduction of all Experiments for 50 Marks
			Execution	25					
			Viva-voce	10					
		Open Ended Experiment	Write up	05	20	----	5	2	One experiment for 20 marks. 20 marks reduced to 05 marks
			Execution	10					
			Viva-voce	05					
	Total CIE Practical						25	10	Scale down Marks of Experiments, Record, Observation, Practical Test and Open-Ended Experiment

SEE		Theory exam	Entire theory syllabus including questions from lab Component in respective Modules	100	----	50	18	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

Note: If few of the 3 Credit Courses are Integrated course type, for such courses the method suggested for 4 Credit IPCC Course shall be followed

4 Credit Course – IPCC

The Minimum Marks to be secured in CIE to appear for SEE shall be 10marks (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).

The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).

A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:

Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.

The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):

The CIE Marks for the theory component of the IPCC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IPCC

Internal Assessment test:

The IA test questions are to be framed to map the Course Outcomes(COs), Program Outcomes(POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **15 Marks.**

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

	• CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
	• CCA as project-based learning,
	  o CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
	  o The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report
	Total score for CCA is **10 Marks**
	
	Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks**
	
	CIE for the practical component of the IPCC
	
	• On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **15 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester.
	• The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks and conduction for 10Marks. Marks of all experiments' write-ups and conduction are added and averaged to 15 Marks.
	• The laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for 50 Marks and scaled down to **05 Marks.**
	• Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**.
	• The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component.
	• The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks.
	The theory component of the IPCC shall be for both CIE and SEE.
	
	Semester End Examination (SEE):
	
	• Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject
	• The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.**
	• The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**.
	• 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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

3 Credit Course – Theory	
	Note: A few of the Courses of 3 Credit are Integrated Course Type, for such courses the method suggested for 4 Credit IPCC shall be followed. **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). The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).

A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:

Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Group Problem Solving, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.

The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):

The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**.

Internal Assessment test:

The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks** scaled down to **25 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **25 Marks.**

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **25 Marks**

Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks**

Semester End Examination (SEE):

- Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject
- The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.**

	• The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student must answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**. 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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	12	10				-------
Understand	14	16				-------
Apply	18	16		12	12	-------
Analyse	6	8		14	14	-------
Evaluate	--	--		14	14	-------
Create	--	--		10	10	-------

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	10	05	05	05	05	30	30%
CO2	05	--	10	05	15	25	25%
CO3	10	10	--	05	15	30	30%
CO4	--	10	--	--	05	10	10%
CO5	--	--	10	10	10	30	30%
CO6	--	--	--	--	--	--	0%
Total	25	25	25	25	50		

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	10
Understand	10
Apply	10

Analyse	**10**
Evaluate	**10**
Create	**--**

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	5	--	5	5	5	20	40%
CO2	--	--	5	--	5	10	20%
CO3	--	10	--	--	--	10	20%
CO4	5	--	--	5	--	10	20%
Total	10	10	10	10	10	50	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	**Introduction to Civil Engineering And**	
1	[A] Introduction to Civil Engineering: Surveying, Structural Engineering, Geo-technical Engineering, Hydraulics & Water Resources	1
1	Transportation Engineering, Environmental Engineering, and Construction planning & Project management.	1
1	[B] Basic Materials of Construction: Bricks, Cement & mortars, Plain, Reinforced	1
1	& Pre-stressed Concrete, Structural steel, Construction Chemicals.	1
1	[C] Structural elements of a building: Foundation, plinth, lintel, chejja	1
1	Masonry wall, column, beam, slab and staircase	1
1	Plinth area, carpet area, floor area ratio	1
1	Numerical problems, local building bye laws.	1
2	**Analysis of force systems:**	
2	Analysis of force systems: Concept of idealization, system of forces, principles of superposition and transmissibility2	1
2	Resolution and composition of forces and numerical problems.	1
2	Law of Parallelogram of forces and numerical problems.	1
2	Resultant of concurrent and non-concurrent coplanar force systems and numerical problems.	1
2	Moment of forces, couple, Varignon's theorem, free body diagram, equations of equilibrium, equilibrium of concurrent and numerical problems.	1

2	Moment of forces, couple and numerical problems.	**1**
2	Varignon's theorem, free body diagram and numerical problems.	**1**
2	Equations of equilibrium, equilibrium of concurrent and non-concurrent coplanar forces systems and numerical problems.	**1**
3	**Environment And Built Environment**	**1**
3	Environment: Water Supply and Sanitary systems	**1**
3	Solid waste management And Identification of Landfill sites;	**1**
3	urban air pollution management, And Urban flood control	**1**
3	Built-environment: Energy efficient buildings	**1**
3	Temperature and Sound control in buildings	**1**
3	Concept of Recycling; Security systems & Smart Buildings	**1**
4	**Geo-technical Engineering:**	
4	Geo-technical Engineering: Origin and formation of soil	**1**
4	Foundations-Importance And Types of foundations.	**1**
4	Factors to be considered in selection of foundations.	**1**
4	Construction Technology : Prefabricated Structures.	**1**
4	Construction Management principles.	**1**
4	Construction Management application	**1**
4	Drone Survey in construction	**1**
5	**Transportation Engineering And Unique Areas:**	
5	Importance and classification of roads and railways	**1**
5	Importance of railways	**1**
5	Types of highway pavements and its functions.	**1**
5	Concepts of Multimodal transportation system- relevance and integration.	**1**
5	Unique Areas: Concepts of Automation and Robotics in Construction	**1**
5	Concept of Sustainability in Civil Engineering	**1**
5	Introduction to sustainable development goals	**1**
5	Concept of Smart, Clean and Safe city.	**1**
Total		**40 Hrs**

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Semester	:	**2nd**				
Course Title	:	**Introduction to Cyber Security**				
Course Code	:	**23ETCS25**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Course Category	:	**ETC**				
Stream	:	**CSE**		**CIE**	:	**50 Marks**
Teaching Hours/week (L:T:P:S)	:	**3:0:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**40 Hrs**		**SEE Duration**	:	**3 Hours**
Credits	:	**3**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	Learn the types of cybercrime, motivation behind the cybercrime, and Indian ITA 2000.
2	Get an overview of various steps involved in hacking, tools used in hacking, cyberstalking, botnet and attack vector.
3	Learn about proxy servers, DoS and DDoS, Steganography, and difference between worm, virus, and Trojan Horse.
4	Understand the different types of phishing, whaling and identity theft.
5	Learn the fundamental concepts of Computer Forensics.

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyse information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Introduction to Computer Networking**: Layered Architecture, Address used in various layers of Communication (IP address, Port, MAC address), Topologies, networking devices **Introduction to Cybercrime:** **Cybercrime:** Definition and Origins of the Word, Cybercrime and Information Security, who are Cybercriminals? Classifications of Cybercrimes, An Indian Perspective, Hacking and Indian Laws., Global Perspectives Textbook:1 Chapter 1 (1.1 to 1.5, 1.7-1.9)	**8hr**
Pedagogy	**Quiz, Seminar**	
2	**Cyber Offenses:** **How Criminals Plan Them:** Introduction, how criminals plan the attacks, Social Engineering, Cyber Stalking, Cybercafé & cybercrimes. **Botnets:** The fuel for cybercrime, Attack Vector. Textbook:1 Chapter 2 (2.1 to 2.7)	**8hr**
Pedagogy	**Demonstrating the tools usage, seminar**	
3	**Tools and Methods used in Cybercrime:** Introduction, Proxy Servers, Anonymizers, Phishing, Password Cracking, Key Loggers and Spy ways, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDOS Attacks, Attacks on Wireless networks. Textbook:1 Chapter 4 (4.1 to 4.9, 4.12)	**8hr**
Pedagogy	**Demonstrating the tools usage, seminar**	
4	**Phishing and Identity Theft:** Introduction, methods of phishing, phishing, phishing techniques, spear phishing, types of phishing scams, phishing toolkits and spy phishing, counter measures, Identity Theft Textbook:1 Chapter 5 (5.1. to 5.3)	**8hr**
Pedagogy	**Quiz and Seminar**	
5	**Understanding Computer Forensics:** Introduction, Historical Background of Cyber forensics, Digital Forensics Science, Need for Computer Forensics, Cyber Forensics and Digital Evidence, Digital Forensic Life cycle, Chain of Custody Concepts, network forensics. Textbook:1 Chapter 7 (7.1. to 7.5, 7.7 to 7.9)	**8hr**
Pedagogy	**Quiz and Seminar**	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Cyber Security: Understanding cybercrime, computer Forensics and Legal Perspective By Nina, Godbole and Sunit Belapure.
2	Computer Networking: This Book Includes: Computer Networking for Beginners and Beginners Guide (All in One) by Russell Scott

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	**Understand** the concept of basic of Networking, Cyber security and issues and challenges associated with it.	**Understand**	**L2**
CO2	**Identify** the cyber-crimes, their nature, legal remedies and as to how report the crimes through available platforms and procedures.	**Apply**	**L3**
CO3	**Understand** the fundamental concepts of cyber forensics, cybercrime investigations, data privacy issues and tools available.	**Understand**	**L2**
CO4	**Acquire knowledge** on various privacy and security concerns while **using** the social media and reporting procedure of inappropriate content, underlying legal aspects.	**Apply**	**L3**

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	--	2	--	--	--	--	--	3	--	--	--	2	--	--
CO2	--	3	--	--	3	--	--	3	--	--	--	2	--	--
CO3	--	--	--	3	3	--	--	3	--	--	--	2	--	--
CO4	--	--	--	3	--	--	--	3	--	--	--	2	--	--
	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Weblinks and Video Lectures (e-Resources)	
1	**https://www.youtube.com/watch?v=6_Cxj5WKplw**
2	**https://www.youtube.com/watch?v=khDuC8oCkUM**
3	**https://www.youtube.com/watch?v=JoeiLuFNBc4&list=PLBInK6fEyqRgJU3EsOYDTW7m6SUmW6kII**
4	**https://www.youtube.com/watch?v=gx0vIRpdFnc&list=PLBInK6fEyqRgJU3EsOYDTW7m6SUmW6kII&index=2**
5	**https://www.youtube.com/watch?v=cg1p3SRZHNY**

Assessment Pattern (both CIE and SEE)

Engineering Science Course (ESC) / Emerging Technology Course (ETC) / Programming Language Course (PLC)								
3 credits - Theory								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Theory + Practical				**50**			**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module - 1 & 2	50	(50+50+50) / 3	**25**	10	Average of Three Internal test each of 50 Marks scale down the marks to 25 Marks
		Internal Assessment Test (IAT) - II	Module - 3 & 4	50				
		Internal Assessment Test (IAT) - III	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**50**	20	Scale down Marks of IAT and CCA to 50

SEE		Theory exam	Entire theory syllabus including questions from lab component	100	----	50	18	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	
				• The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component. • The Laboratory Component for the IPCC shall be for CIE only. • However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.				

4 Credit Course – IPCC	
	The Minimum Marks to be secured in CIE to appear for SEE shall be 10marks (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only. **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). The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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. **Possible continuous and comprehensive assessment:** Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics. The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC). **Continuous Internal Evaluation (CIE):** The CIE Marks for the theory component of the IPCC shall be **25 Marks** and for the laboratory component **25 Marks**. **CIE for the theory component of the IPCC** **Internal Assessment Test (IAT):** **The IA test questions are to be framed to map the Course Outcomes(COs), Program Outcomes(POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels** Three Tests each of **50 Marks** • First test after 6th week of the semester (syllabus completion of 35 – 40%) • Second test after 10th week of semester (syllabus completion of 65 – 70%) • Third test after 14th week of semester (syllabus completion of 90 – 100%) The average score of three test is taken and scaled down to **15 Marks.** **Continuous and Comprehensive Assessment (CCA):** Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**. • CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics • CCA as project-based learning, o CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission. o The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

	Total score for CCA is **10 Marks** Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks** **CIE for the practical component of the IPCC** • On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **10 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester and **5 Marks** for conducting Open Ended Experiments. • The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks conduction(Observation Book) and 5 Marks for Record Book. Marks of all experiments' write-ups and conduction are added and scaled to **10 Marks.** • The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **10 Marks.** • Open Ended Experiments are conducted after the completion of regular Experiments/Programs for 20 Marks and scaled down to **5 Marks** • Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**. • The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component. • The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks. The theory component of the IC shall be for both CIE and SEE. **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.** • The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**. • 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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

3 Credit Course – Theory	
	Note: A few of the Courses of 3 Credit are Integrated Course Type, for such courses the method suggested for 4 Credit IPCC shall be followed. **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).

	The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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. **Possible continuous and comprehensive assessment:** Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Group Problem Solving, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics. The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC). **Continuous Internal Evaluation (CIE):** The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**. **Internal Assessment test:** **The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels** Three Tests each of **50 Marks** scaled down to **25 Marks** • First test after 6th week of the semester (syllabus completion of 35 – 40%) • Second test after 10th week of semester (syllabus completion of 65 – 70%) • Third test after 14th week of semester (syllabus completion of 90 – 100%) The average score of three test is taken and scaled down to **25 Marks.** **Continuous and Comprehensive Assessment (CCA):** Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**. • CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics • CCA as project-based learning, o CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission. o The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report Total score for CCA is **25 Marks** Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks** **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.** • The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student must answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**.

	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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	10%	10%	10%		
Understand	40%	40%	40%		
Apply	40%	40%	40%		
Analyse	10%	10%	10%		
Evaluate				50	
Create					50

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	25			05	20	50	33.33%
CO2		25		--	05	30	20%
CO3			25	10	05	40	26.27%
CO4				10	20	30	20%
Total	25	25	25	25	50	150	

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	15%
Understand	60-70%
Apply	10-15%
Analyse	--
Evaluate	--
Create	--

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	20	--	--	05	10	35	35
CO2	--	20	--	--	--	20	20
CO3	--	--	20	10	--	30	30
CO4	--	--		05	10	15	10
Total	20	20	20	20	20	100	100

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
	Introduction to Course, Discussion on CO, PO, CIE, SEE, Assignment	1
1	**Introduction to Computer Networking**: Layered Architecture,	1
1	Address used in various layers of Communication (IP address, Port, MAC address),	1
1	Topologies, networking devices	1
1	**Introduction to Cybercrime: Cybercrime:** Definition and Origins of the Word,	1
1	Cybercrime and Information Security,	1
1	who are Cybercriminals? Classifications of Cybercrimes	1
1	An Indian Perspective,	1
1	Hacking and Indian Laws., Global Perspectives	1
2	**Cyber Offenses:** **How Criminals Plan Them:** Introduction, ,	1
2	how criminals plan the attacks	1
2	Social Engineering	1
2	Cyber Stalking	1
2	Cyber Stalking	1
2	Cybercafé & cybercrimes	1
2	**Botnets:** The fuel for cybercrime	1
2	Attack Vector	1
3	**Tools and Methods used in Cybercrime:** Introduction, Proxy Servers, Anonymizers	1
3	Phishing, Password Cracking,	1
3	Key Loggers and Spy ways	1
3	Virus and Worms	1
3	Trojan Horses and Backdoors	1
3	Steganography	1
3	DoS and DDOS Attacks	1
3	Attacks on Wireless networks.	1
4	**Phishing and Identity Theft:** Introduction, methods of phishing	1
4	phishing techniques	1
4	spear phishing	1
4	types of phishing scams	1
4	phishing toolkits and spy phishing	1
4	phishing toolkits and spy phishing	1
4	Phishing counter measures,	1
4	Identity Theft	1

5	**Understanding Computer Forensics:** Introduction, , ,	**1**
5	Historical Background of Cyber forensics	**1**
5	Digital Forensics Science	**1**
5	Need for Computer Forensics	**1**
5	Cyber Forensics and Digital Evidence	**1**
5	Digital Forensic Life cycle	**1**
5	Digital Forensic Life cycle	**1**
5	Chain of Custody Concepts, network forensics.	**1**
Total		**41Hrs**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**1st / 2nd**				
Course Title	:	**Introduction to Electronics Engineering**				
Course Code	:	**23CECE15 / 23CECE25**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Course Category	:	**CEC-1 / CEC-2**				
Stream	:	**Other Branches**		**CIE**	:	**50 Marks**
Teaching hours/ week (L:T:P:S)	:	**3:0:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**40 Hrs T**		**SEE Duration**	:	**03 Hours**
Credits	:	**03**				

Course Learning Objectives: Students will be taught

Sl. No	Course Objectives
1	**Learn** the fundamentals of integrated circuits, communication systems and advanced technologies
2	Familiarise in **applying** the concepts of electronic circuits and devices for the given application
3	Provide the knowledge in **examining** various electronic circuits
4	Impart **design** skills of circuits for real time applications
5	**Equip** with the usage of modern tools to simulate various integrated circuits

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Digital Electronics:** Binary, Decimal, Octal and hexadecimal Number systems, Number base Conversion, Complements, Basic theorems and properties of Boolean algebra, Boolean functions, Canonical and Standard forms, Digital Logic gates. **Combinational Logic:** Introduction, Adders: Half adder and Full adders. **Text-1**	8
Pedagogy	Mobile Studio	
2	**Operational Amplifiers:** Introduction, Block diagram of OPAMP, OPAMP parameters, Ideal and Practical Characteristics of OPAMP. **OPAMP applications:** Inverting and Non-Inverting Amplifiers, Voltage Follower, Summer, Differentiator, Integrator **Text-2**	8
Pedagogy	Think Pair Share	
3	**Embedded Systems –** Definition, Embedded systems vs General Computing Systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Elements of an Embedded System, Core of the Embedded System, Microprocessor vs Microcontroller, RISC vs CISC. **Text – 3** Sensors, types and its Applications **Text – 5**	8
Pedagogy	Case Studies	
4	**Analog Communication** – Communication system scheme, Information source, and input transducer, Transmitter, Channel or Medium – Hardwired and Soft wired, Noise, Receiver, Multiplexing, Types of communication systems. Types of modulation (only concepts) – AM, FM. **Digital Communication:** Advantages of digital communication over analog communication, ASK, FSK, PSK, Radio signal transmission, Multiple Access Techniques. **Text - 4**	8
Pedagogy	Demonstration	
5	**Cellular wireless networks:** Cellular Telephone system, Cellular concepts, Network topology, wireless LAN, Bluetooth. **Text - 4** **Fundamentals of VLSI:** Evolution of Microelectronics, Basics structures NMOS, PMOS and CMOS, Moore's Law, Depletion Mode and Enhancement mode Transistors, VLSI Design flow. **Text - 5**	8
Pedagogy	Flipped Class Room	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203- 0417-84
2	Op-amps and Linear Integrated Circuits, Ramakanth A Gayakwad, Pearson Education, 4th Edition
3	K V Shibu, 'Introduction to Embedded Systems', 2nd Edition, McGraw Hill Education (India), Private Limited, 2016
4	S L Kakani and Priyanka Punglia, 'Communication Systems', New Age International Publisher, 2017
5	Raj Kamal , 'Internet of Things – Architecture and Design Principles', Mc Graw Hill Education

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	**Understand** the concepts of integrated circuits, communication systems and advanced technologies.	**L2**	**Understand**
CO2	**Apply** the fundamentals of integrated circuits to provide solution for analog and digital circuits.	**L3**	**Apply**
CO3	**Analyse** the operation of electronic circuits for a given problem scenario.	**L4**	**Analyse**
CO4	**Design** Linear Integrated and logic circuits for real time applications.	**L3**	**Apply**
CO5	**Examine** the performance of various electronic circuits using modern tools.	**L4**	**Analyse**

Mapping of Course Outcomes to Program Outcomes:

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	**-**
CO2	3	-	-	-	-	-	-	-	-	-	-	-	**2**	**-**	**-**
CO3		2	-	-	-	-	-	-	-	-	-	-	**2**	**-**	**-**
CO4	-	-	3	2	-	-	-	-	2	2	-	-	**2**	**-**	**-**
CO5	-	-	-	-	2	-	-	-	2	2	-	2	**2**	**-**	**-**

Weblinks and Video Lectures (e-Resources)

1	https://nptel.ac.in/courses/122106025
2	https://nptel.ac.in/courses/108105132
3	https://nptel.ac.in/courses/117104072
4	https://E-learning.vtu.ac.in
5	https://www.coursera.org/courses/digital-circuits

Assessment Pattern (both CIE and SEE)

Engineering Science Course (ESC) / Emerging Technology Course (ETC) / Programming Language Course (PLC)								
3 credits - Theory								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Theory				**50**			**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module - 1 & 2	50	(50+50+50) / 3	**25**	10	Average of Three Internal test each of 50 Marks scale down the marks to 25 Marks
		Internal Assessment Test (IAT) - II	Module - 3 & 4	50				
		Internal Assessment Test (IAT) - III	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**50**	20	Scale down Marks of IAT and CCA to 50

SEE		Theory exam	Entire theory Syllabus	100	----	50	18	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	

4 Credit Course – IPCC

The Minimum Marks to be secured in CIE to appear for SEE shall be 10marks (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:
Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.
The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):
The CIE Marks for the theory component of the IPCC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IPCC
Internal Assessment test:

The IA test questions are to be framed to map the Course Outcomes(COs), Program Outcomes(POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks**
- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **15 Marks.**

Continuous and Comprehensive Assessment (CCA):
Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**.
Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.
- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**
Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks**

CIE for the practical component of the IPCC
- On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **15 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester.
- The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks and conduction for 10Marks. Marks of all experiments' write-ups and conduction are added and averaged to 15 Marks.
- The laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for 50 Marks and scaled down to **05 Marks.**

	• Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**. • The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component. • The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks. The theory component of the IPCC shall be for both CIE and SEE. **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.** • The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**. • 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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

3 Credit Course – Theory	
	Note: A few of the Courses of 3 Credit are Integrated Course Type, for such courses the method suggested for 4 Credit IPCC shall be followed. **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). The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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. **Possible continuous and comprehensive assessment:** Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Group Problem Solving, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics. The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC). **Continuous Internal Evaluation (CIE):** The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**. **Internal Assessment test:** **The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels** Three Tests each of **50 Marks** scaled down to **25 Marks** • First test after 6th week of the semester (syllabus completion of 35 – 40%) • Second test after 10th week of semester (syllabus completion of 65 – 70%) • Third test after 14th week of semester (syllabus completion of 90 – 100%) The average score of three test is taken and scaled down to **25 Marks.** **Continuous and Comprehensive Assessment (CCA):** Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**. • CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics

	• CCA as project-based learning, o CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission. o The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report Total score for CCA is **25 Marks** Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks** **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject • The question paper shall be set for 100 Marks. The medium of the question paper shall be English. **The duration of SEE is 03 hours.** • The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student must answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**. 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. The two questions shall be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	--	--	--	--	--	NA
Understand	10	20	20	--	--	NA
Apply	25	20	20	20	20	NA
Analyse	15	10	10	20	20	NA
Evaluate	--	--	--	10	10	NA
Create	--	--	--	--	--	NA

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage (%)
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	04	06	10	10	20	50	33
CO2	10	05	10	10	20	55	37
CO3	10	05	05	05	10	35	23
CO4	05	05	--	--	--	10	07
CO5	--	--	--	--	--	--	--
Total	28	22	26	24	50	150	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (100% Theory)
Remember	**--**
Understand	33%
Apply	50%
Analyse	17%
Evaluate	**--**
Create	**--**

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage (%)
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	05	06	08	06	08	33	33
CO2	05	07	06	08	07	33	33
CO3	--	-	06	06	05	17	17
CO4	**10**	**07**	**--**	**--**	**--**	**17**	**17**
CO5	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Total	**20**	**20**	**20**	**20**	**20**	**100**	**100%**

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	**Digital Electronics:** Binary, Decimal, Octal and hexadecimal Number systems,	1
	Number base Conversion,	1
	Complements,.	1
	Basic theorems and properties of Boolean algebra,	1
	Boolean functions,	1
	Canonical and Standard forms, Digital Logic gates.	1
	Combinational Logic: Introduction, Adders: Half adder and	1
	Full adders	1
2	**Operational Amplifiers:** Introduction, Block diagram representation of OPAMP, .	1
	OPAMP parameters,	1
	Ideal Characteristics of OPAMP.	1
	Practical Characteristics of OPAMP.	1
	OPAMP applications: Inverting and Non-Inverting amplifiers,	1
	Voltage Follower, summer,	1
	Differentiator,	1

	Integrator	1
3	**Embedded Systems –** Definition, Embedded systems vs General Computing Systems,	1
	Classification of Embedded Systems, Major application areas of Embedded Systems,	1
	Elements of an Embedded System, Core of the Embedded System,	1
	Microprocessor vs Microcontroller, RISC vs CISC.	1
	Introduction to sensors	1
	Sensor types	1
	Sensor types Contd	1
	Applications of Sensors	1
4	**Analog Communication** – Modern communication system scheme, Information source, and input transducer,	1
	Transmitter, Channel or Medium – Hardwired and Soft wired,	1
	Noise, Receiver, Multiplexing,	1
	Types of communication systems. Types of modulation (only concepts) – AM, FM.	1
	Digital Communication : Advantages of digital communication over analog communication,	1
	ASK, FSK, PSK,	1
	Radio signal transmission,	1
	Multiple Access Techniques.	1
5	**Cellular wireless networks:** Cellular Telephone system,	1
	Cellular concepts, Network topology,	1
	wireless LAN,	1
	Bluetooth.	1
	Fundamentals of VLSI: Evolution of Microelectronics,	1
	Basics structures NMOS, PMOS and CMOS,	1
	Moore's Law, Depletion Mode and Enhancement mode Transistors,	1
	VLSI Design flow,	1
	Total	**40 Hrs**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**2nd**				
Course Title	:	**Introduction to Python Programming**				
Course Code	:	**23PLCS21**				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Category	:	**PLC / PBL**				
Stream	:	**Common to all branches**		**CIE**	:	**50 Marks**
Teaching hours/ week (L:T:P:S)	:	**2:0:2:0**		**SEE**	:	**50 Marks**
Total Hours	:	**28+12=40 Hrs**		**SEE Duration**	:	**3 Hours**
Credits	:	**03**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Learn the syntax and semantics of the Python programming language.
2	Illustrate the process of structuring the data using lists, tuples
3	Analyse string manipulation and pattern matching methods
4	Demonstrate the use of built-in functions to navigate the file system.
5	Implement the Object-Oriented Programming concepts in Python.

Teaching-Learning Process

Pedagogy:

Some sample strategies to accelerate the attainment of the various course outcomes are listed below:

1. Adopt different teaching methods to attain the course outcomes.
2. Include videos to demonstrate various concepts in Python.
3. Encourage collaborative (Group) learning to enhance team building.
4. Include at least three **HOTs (Higher-order Thinking Skills)** modulewise questions to promote critical thinking.
5. Adopt **Problem-Based Learning (PBL)**, which fosters students' analytical skills and develops thinking skills such as evaluating, generalizing, and analysing information rather than simply recalling it.
6. Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
7. Discuss various case studies to map with real world scenarios and improve the understanding.
8. Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE CURRICULUM

Module No.	Contents of the Module	Hours
1	**Python Basics**: Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program. **Flow control:** Boolean Values, Comparison Operators, Boolean Operators, Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules.	6
2	**Functions:** def Statements with Parameters, Return Values and return Statements, The None Value, Keyword Arguments and print (), Local and Global Scope, The global Statement, Exception Handling, Recursion. **Lists:** The List Data Type, Working with Lists, Methods, List Memory management List-like Types. Tuples- Working with Tuples	6
3	**Dictionaries:** The Dictionary Data Type, Method, Working with dictionaries, types, data set handling with dictionaries, Pretty Printing. **Strings:** Working with Strings, Useful String Methods, Pattern matching with Regular Expressions, Patten matching without Regular Expressions	5
4	**Files operations:** Files and File Paths, The os. path Module, File Operations, Compressing Files with the zip file, exception handling. **Classes and objects:** Defining a Class, Defining a Method, Instantiating an Object, Invoking a Method, Using Constructor, Using Class Attributes and Static Methods, Understanding Object, property , decorators, composition and aggregation	5
5	**Object-Oriented Programming:** Encapsulation, Polymorphism, Abstraction, Inheritance **Scientific Computing Using Python:** Data analysis and numerical computing with NumPy and plotting, Introduction to scipy, pandas, Scikit-learn, pytorch.	6

Pedagogical Initiatives (Not limited to):

- **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another
- **Problem Solving**: encourages cognitive thinking and enables creative problem solving
- **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily.
- **Case studies:** maps different domains in real time applications
- **Demonstration:** exhibits the implementation process

List of Programs

Getting Started: Introducing Python, Setting Up Python in operating systems like windows, LINUX etc., Python in Real time Applications.

Note: Python platforms to be used: Anaconda, Pycharm, IDLE.

Sl. No.	List of Programs	COs
1.	a. Develop a program to read the student details like Name, USN, and Marks in three subjects. Display the student details, total marks and percentage with suitable messages. b. Develop a Python program to check whether a given number is palindrome or not and also count the number of occurrences of each digit in the input number	CO1
2.	a. Develop a program to generate Fibonacci sequence of length (N). Read N from the console. b. Write a function to calculate factorial of a number with and without recursion.	CO2
3.	a. Read N numbers from the console and create a list. Develop a program to print mean, variance and standard deviation with suitable messages using functions. b. Develop a python program to convert binary to decimal, octal to hexadecimal using functions.	CO2
4.	Read a multi-digit number (as chars) from the console. Develop a program to print the frequency of each digit with suitable messages.	CO2
5.	a. Develop a program to print 10 most frequently appearing words in a text file. [Hint: Use dictionary with distinct words and their frequency of occurrences. Sort the dictionary in the reverse order of frequency and display dictionary slice of first 10 items] b. Develop a program to sort the contents of a text file and write the sorted contents into a separate text file. [Hint: Use string methods strip(), len(), list methods sort(), append(), and file methods open(), read lines(), and write()].	CO3
6.	a. Develop a program to backing Up a given Folder (Folder in a current working directory) into a ZIP File by using relevant modules and suitable methods. b. Write a function named DivExp which takes TWO parameters a, b and returns a value c (c=a/b). Write suitable assertion for a>0 in function DivExp and raise an exception for when b=0. Develop a suitable program which reads two values from the console and calls a function DivExp.	CO3
7.	a. Develop a Python program to demonstrate find all function and character class using regex module. b. Develop a python program that could search the text in a file for phone numbers (+919900889977) and email addresses (sample@gmail.com).	CO4

8.	Define a function which takes TWO objects representing complex numbers and returns new complex number with a addition of two complex numbers. Define a suitable class 'Complex' to represent the complex number. Develop a program to read N (N >=2) complex numbers and to compute the addition of N complex numbers.	**CO3**
9.	Develop a program that uses class Student which prompts the user to enter marks in three subjects and calculates total marks, percentage and displays the score card details. [Hint: Use list to store the marks in three subjects and total marks. Use __init__() method to initialize name, USN and the lists to store marks and total, Use getMarks() method to read marks into the list, and display() method to display the score card details.].	**CO3**
10.	Develop a program to convert list and dictionary into NumPy array	**CO5**
	Open Ended Questions: 1. Design a web page using Flask in python. 2. Demonstrate Web scraping using suitable example. 3. Demonstrate API Integration. 4. Demonstrate about Data Visualization. 5. Demonstrate GUI Applications. 6. Demonstrate E-mail Automation.	

Programming Language Course / Project Based Learning (PLC/PBL): Introduction to Python Programming

This Course refers to Professional Theory Core Course Integrated with Practical Component Credit for this course can be 03 and its Teaching Learning hours (L: T: P: PJ) can be considered as (2: 0: 2: 0).

CIE for Practical component of the PLC/PBL:

15 marks for the conduction of practical experiment and preparation of the Laboratory record, and **10 marks** for the test to be conducted after the completion of all the laboratory sessions.

On completion of every program in the laboratory, the student shall be evaluated including viva-voce and marks shall be awarded on the same day.

Each program report can be evaluated for **15 marks** (Write-up – 3 marks, Execution – 8 marks .and Viva – 4 marks)

The Laboratory test (duration 2 hours / 3 hours) after completion of all the programs shall be conducted for 50 marks and scaled down to **10 marks.**

The project review (periodical review) shall be conducted for 50 marks and scale down to **10 marks.**

The theory part 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 PLC/PBL shall be included in the SEE question paper. This course is common to all branches of first year B.E 2023-24 regulation.

Note: L- Theory Lecture, T- Tutorial, P-Practical, PJ-Project, CIE: Continuous Internal Evaluation, SEE: Semester End Examination.

Text Books	
1.	**Automate the Boring Stuff with Python,** Al Sweigart, No Starch Press, 1st Edition, 2015
2.	**Scientific Computing with Python: High-performance scientific computing with NumPy, SciPy, and pandas** by Claus Fuhrer, Jan Erik Solem, Olivier Verdier, Pakt publications, 2nd Edition, 2021
Reference Books	
1.	**Think Python: How to Think Like a Computer Scientist,** Allen B. Downey, Green Tea Press 2nd Edition, 2015.
2.	**Python for data analysis,** Wes Mckinney, O'Relly Publications, 3rd edition ,2023

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	**Understand** the syntax and schematics of Python programming.	**Understand**	**L2**
CO2	**Apply** data structures, functions for effective implementation of solution.	**Apply**	**L3**
CO3	**Analyse** object-oriented concepts and file operations.	**Analyse**	**L4**
CO4	**Evaluate** strings using pattern recognition techniques.	**Evaluate**	**L5**
CO5	**Implement** real world problems by using Data analysis and Scientific computation methods.	**Create**	**L6**

Weblinks and Video Lectures (e-Resources)	
1	The Joy of Computing using Python: https://onlinecourses.nptel.ac.in/noc23_cs20/preview
2	Python for Data Science: https://onlinecourses.nptel.ac.in/noc22_cs32/preview
3	Infyspringboard-Scipy: https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012825354493067264684 22_shared/overview
4	Python for everybody: Course era
5	Udemy: https://www.udemy.com/course/python-pandas/ -

Assessment Pattern (both CIE and SEE)

Engineering Science Course (ESC) / Emerging Technology Course (ETC) / Programming Language Course (PLC)

3 Credits & 2 Credits Courses – Theory (if Integrated)

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average / Total	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module - 1 & 2	50	(50+50+50) / 3	**15**	6	Average of Three Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module - 3 & 4	50				
		Internal Assessment Test (IAT) - III	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Project Review – 1	Considering all the Modules	20	50	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Project Review – 2		30				
	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25

CIE	**Practical**	Conduction of Experiments	Continuous Evaluation of each experiment			Average of all Experiments	**10**	4	Performance of the Experiment (On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. 20 marks are for conducting the experiment and calculations/observations/output)
			Record	05	10				
			Observation book	05					
		Practical Test	Write up	15	50	----	**10**	4	One Internal Practical Test after conduction of all Experiments for 50 Marks
			Execution	25					
			Viva-voce	10					
		Open Ended Experiment	Write up	05	20	----	**5**	2	One experiment for 20 marks. 20 marks reduced to 05 marks
			Execution	10					
			Viva-voce	05					
	Total CIE Practical						**25**	10	Scale down Marks of Experiments, Record, Observation, Practical Test and Open-Ended Experiment

SEE		Theory exam	Entire theory syllabus including questions from lab Component in respective Modules	100	----	**50**	18	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

Note: If few of the 3 Credit Courses are Integrated course type, for such courses the method suggested for 4 Credit IPCC Course shall be followed

The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:
Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.
The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):
The CIE Marks for the theory component of the IC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IC
Internal Assessment test:

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks** scaled down to **25 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **15 Marks.**

Continuous and Comprehensive Assessment (CCA):
Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**
Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks**

CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **10 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester and **5 Marks** for conducting Open Ended Experiments.
- The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks conduction(Observation Book) and 5 Marks for Record Book. Marks of all experiments' write-ups and conduction are added and scaled to **10 Marks.**
- The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **10 Marks.**
- Open Ended Experiments are conducted after the completion of regular Experiments/Programs for 20 Marks and scaled down to **5 Marks**
- Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**.
- The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component.
- The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks.

The theory component of the IC shall be for both CIE and SEE.

Semester End Examination (SEE):

- Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**
- The question paper shall be set for 100 Marks. The medium of the question paper shall be English. The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**.
- 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. The two questions should be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1 (Review 1)	CCA-2 (Review 2)	
	50 Marks	50 Marks	50 Marks	20 Marks	30 Marks	50 Marks
Remember	10	-	-	-	-	
Understand	20	10	-	10		
Apply	20	20	10	5	5	20
Analyse	-	20	20	5	5	10
Evaluate	-	-	15	-	10	10
Create	-	-	5	-	10	10

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	10	10	-	-	-	20	13.33%
CO2	5	5	10	10	10	40	26.66%
CO3	5	5	5	5	15	35	23.33%
CO4	5	5	5	5	15	35	23.33%
CO5	--	--	5	5	10	20	13.33%
Total	25	25	25	25	50	150	100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	5
Understand	5
Apply	10

Analyse	**10**
Evaluate	**10**
Create	**10**

SEE Course Plan

CO's	**Marks Distribution**					**Total Marks**	**Weightage**
	Module-1	**Module-2**	**Module-3**	**Module-4**	**Module-5**		
CO1	**10**	**--**	**--**	**--**	**--**	**10**	**10%**
CO2	**10**	**10**	**--**	**--**	**--**	**20**	**20%**
CO3	**--**	**10**	**10**	**--**	**--**	**20**	**20%**
CO4	**--**	**--**	**10**	**10**		**20**	**20%**
CO5	**--**	**--**		**10**	**10**	**20**	**20%**
Total	**20**	**20**	**20**	**20**	**20**	**100**	**100%**

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**1st**				
Course Title	:	**Principles of Programming Using C**				
Course Code	:	**23ESCS11**				
Course Type (Theory/ Practical/ Integrated)	:	**Integrated**				
Category	:	**ESC**				
Stream	:	**Common to all branches**		**CIE**	:	**50 Marks**
Teaching hours/ week (L:T:P:S)	:	**2:0:2:0**		**SEE**	:	**50 Marks**
Total Hours	:	**28+12=40 Hrs**		**SEE Duration**	:	**3 Hours**
Credits	:	**03**				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	Understand the basics of computers and C programming.
2	Learn the concepts of Functions, and Strings using C programming.
3	Study different Searching, Sorting techniques, and File handling in C.
4	Explore user-defined data structures such as Arrays, Pointers, and Structures in implementing solutions to problems.
5	Design and develop solutions to problems using a structured programming approach.

Teaching-Learning Process

Pedagogical Initiatives:

Some sample strategies to accelerate the attainment of various course outcomes are listed below:

1. Adopt different teaching methods to attain the course outcomes.
2. Include videos to demonstrate various concepts in C.
3. Encourage collaborative (Group) Learning to encourage team building.
4. Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
5. Adopt **Problem-Based Learning (PBL),** which fosters students' analytical skills, and develops thinking skills such as evaluating, generalizing, and analyzing information rather than simply recalling it.
6. Show different ways to solve a problem and encourage the students to come up with creative and optimal solutions.
7. Discuss various case studies to map with real-world scenarios and improve the understanding.
8. Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24

Outcome Based Education and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2023-24)

COURSE CURRICULUM

Module No.	Topics	Hours
1	**Introduction to C:** Fundamentals of computing, Flowcharts, Pseudocodes, Algorithm, Data types, Variables, Constants, Pre-processors, Introduction to C, Structure of C program, Files used in a C program, Compilers, Compiling and executing C programs, Types of Errors, Applications of C language.	5
2	**Operators and expressions in C:** Operators in C: arithmetic, relational, equality, logical, assignment, unary, conditional, bitwise operator, Increment and decrement operator, Conditional Operator, operator precedence, keywords and identifiers, type conversion and typecasting. **Decision control and Looping statements:** Introduction to decision control, Conditional branching statements, Iterative statements, Nested loops, break and continue statements, goto statement.	5
3	**Functions:** Basics of functions, function call, return statement, passing parameters to functions, scope of variables, storage classes, recursive and non-recursive functions. **Arrays:** Declaration of arrays, accessing the elements of an array, storing values in arrays, operations on arrays, one-dimensional array, multidimensional arrays, passing arrays to functions, applications of arrays	6
4	**Strings:** Introduction, String taxonomy, operations on strings, miscellaneous string and character functions, arrays of strings: **Pointers:** Introduction to pointers, Declaring pointer variables, Pointer to pointer, passing arguments to functions using pointers, Array of pointers, Dynamic memory allocation functions malloc/realloc/free. **Structure and Union:** Introduction, Structures and functions, Unions, Unions inside structures, Self-referential structures.	6
5	**Searching algorithm:** Linear search, Binary search. **Sorting algorithm:** Selection sort, Insertion sort, Bubble sort. **File Handling:** Introduction, Using files, Read and Write Operations on files	6

	Pedagogical Initiatives (Not limited to): • **Think Pair and Share (Blended Learning):** provides an opportunity for students to learn from one another • **Problem Solving**: encourages cognitive thinking and enables creative problem solving • **Poster Presentation:** allows students to represent the concepts visually in order to understand the topics easily. • **Case studies:** maps different domains in real time applications • **Demonstration:** exhibits the implementation process

List of Programs:

Sl. No.	Experiments/Programs	COs
1	Write a C program to implement a Simple Calculator.	CO1
2	a) Compute the roots of a quadratic equation by accepting the coefficients. Print appropriate messages. b) Write a C program to print Pyramid of stars patterns using Looping	CO1
3	Implement Matrix multiplication and validate the rules of multiplication using C Program.	CO1
4	Write a C program for the following condition using Functions, Assume a Car servicing Center. Every service request by the Car Service Center the given charges are levied along with taxes. a. Car water wash - Rs. 500 + 10% tax b. Oil in the Engine must be at least 300 ml. If it goes below 300 ml (Ask the user to input the current level of oil in the engine), top up is done by the agency (the value of top up is given by the user so that level is at least 300 ml). Cost of 1 ml is Rs. 5 + 12.5% tax. 1. Define suitable variables to capture the above 2 parameters and corresponding taxes 2. Compute the total amount to be paid. 3. Display the total with 17 places which includes 7 places for fraction. The integer part of the total must be prefixed with 0's and a sign, if required.	CO2
5	Write a program in C using functions to swap two numbers using global variables concept and call by reference concept.	CO2
6	Implement a C program to read the values from the user today's date and your Date of birth in the format dd-mm-yyyy. Consider your sleeping time 8 hours a day, read 12 hours and spend 1.5 hours a day for eating. Calculate how many minutes have you spent as of this date for Sleeping and Eating. The number of years you have spent for reading as of this date (amount of time spent for reading in years).	CO2
7	a) Write functions to implement string operations such as compare, concatenate, and find string length. Use the parameter passing techniques. b) Implement a C Program to check String is a Palindrome or Not	CO2

8	Write a C Program to Implement linear search and binary search.	**CO3**
9	Write a C Program to Implement Bubble Sort.	**CO3**
10	Write a C program to read employee information (Name, Designation, Salary) from the user and write it to a file.	**CO3**
11	Write a C Program to input even & odd elements of an array in two separate arrays. The program first finds the odd and even elements of the array. Then the odd elements of an array are stored in one array and even elements of an array is stored in another array	**CO4**
12	Write a C program to define a structure to represent a cricketer's information (name, runs, average). Read the data corresponding to N Cricketer's in a structure array. The space for the array of structures should be determined at run-time by user input.	**CO4**
Open ended Programs		
1	Develop a 'C' program to calculate the gravitational pull between two objects.	**CO1**
2	Demonstrate a simple units convertor for distance, temperature, and liquid volume.	**CO1**
3	Calculate the displacement for an automobile using pointers.	**CO4**
4	Demonstrate the use of an array of pointers.	**CO4**

CIE for Principles of Programming Using C (Integrated Professional Core Course (IPCC)):

This Course refers to professional theory core course integrated with practical. Credit for this course can be 03 and its Teaching Learning hours (L : T : P: PJ) can be considered as (2 : 0 : 2 : 0).

15 marks for the conduction of practical experiment and preparation of the Laboratory record, and **10 marks** for the test to be conducted after the completion of all the laboratory sessions.

On completion of every program in the laboratory, the student shall be evaluated including viva-voce and marks shall be awarded on the same day.

Each program report can be evaluated for **15 marks** (Write-up – 3 marks, Execution – 8 marks .and Viva – 4 marks)

The Laboratory test (duration 2 hours / 3 hours) after completion of all the programs shall be conducted for 50 marks and scaled down to **10 marks.**

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.

This course is common to all branches of first year B.E/B.Tech. 2023-24 regulation.

Note: L- Theory Lecture, T- Tutorial, P-Practical, PJ-Project, IPCC: Integrated Professional Core Course, CIE: Continuous Internal Evaluation, SEE: Semester End Examination.

Text Books

Sl. No.	**Title of the Book/Name of the author/Name of the publisher/Edition and Year**
1	Computer Fundamentals and Programming in C, Reema Thareja, Oxford University, Second Edition, ISBN-13: 978-0-19-946373-2, 2017.
2	C, The Complete Reference is a book on computer programming, Herbert Schildt, McGraw Hill Education, 4th Edition, ISBN-13: 978-0070411838, 2017.

Reference Books

1	C: How to program, H. M. Deitel, P. J. Deitel, Pearson Education, 7th Edition, ISBN-13. 978-9332555310, 2010.
2	Programming in ANSI C, E. Balaguruswamy, Tata McGraw-Hill,7th Edition, ISBN 1-874152-02-0, 2019.
3	C Programming for Dummies, Dan Hookin, John Wiley & Sons, 2nd Edition, ISBN-13: 978-1119740247, 2021.

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

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	**Understand** the basics of programming in C	U	L2
CO2	**Apply** the knowledge of Functions, Strings using C Programming	A	L3
CO3	**Analyse** the user-defined data structures such as Arrays, Pointers and Structures in implementing solutions to problems.	An	L4
CO4	**Implement** different searching, sorting techniques, and file handling operations.	C	L5
CO5	**Develop** solutions to problems using structured programming approach	C	L5

Weblinks and Video Lectures (e-Resources)	
1	https://archive.nptel.ac.in/courses/106/105/106105171/ (12 Weeks NPTEL Course Videos)
2	https://researchcomputing.princeton.edu/education/external-online-resources/cplusplus
3	https://www.w3schools.com/c/
4	https://ocw.mit.edu/courses/6-087-practical-programming-in-c-january-iap-2010/
5	https://sanfoundry.com/c-programming-examples-linked-list/
6	https://onlinecourses.swayam2.ac.in/cec20_cs02/preview
7	https://www.youtube.com/watch?v=_MF8L7ZxwRE
8	https://www.youtube.com/watch?v=0Sg6QHmlFJE

9	https://www.newtondesk.com/c-programming-handwritten-study-notes-pdf/
10	https://www.eskimo.com/~scs/cclass/notes/top.html
11	https://www.javatpoint.com/c-programming-language-tutorial
12	https://www.tutorialspoint.com/cprogramming/index.htm

Engineering Science Course (ESC) / Emerging Technology Course (ETC) / Programming Language Course (PLC)

3 Credits & 2 Credits Courses – Theory (if Integrated)

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory + Practical				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module - 1 & 2	50	(50+50+50) / 3	**15**	6	Average of Three Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module - 3 & 4	50				
		Internal Assessment Test (IAT) - III	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25

CIE	**Practical**	Conduction of Experiments	Continuous Evaluation of each experiment			Average of all Experiments	10	4	Performance of the Experiment (On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. 20 marks are for conducting the experiment and calculations/observations/output)
			Record	05	10				
			Observation book	05					
		Practical Test	Write up	15	50	----	10	4	One Internal Practical Test after conduction of all Experiments for 50 Marks
			Execution	25					
			Viva-voce	10					
		Open Ended Experiment	Write up	05	20	----	5	2	One experiment for 20 marks. 20 marks reduced to 05 marks
			Execution	10					
			Viva-voce	05					
	Total CIE Practical						25	10	Scale down Marks of Experiments, Record, Observation, Practical Test and Open-Ended Experiment

SEE		Theory exam	Entire theory syllabus including questions from lab Component in respective Modules	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

Note: If few of the 3 Credit Courses are Integrated course type, for such courses the method suggested for 4 Credit IPCC Course shall be followed

The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).
The minimum passing mark for the SEE is 40% of the maximum Marks (20 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 40% (20 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:
Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.
The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):
The CIE Marks for the theory component of the IC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IC
Internal Assessment test:

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Three Tests each of **50 Marks** scaled down to **25 Marks**

- First test after 6th week of the semester (syllabus completion of 35 – 40%)
- Second test after 10th week of semester (syllabus completion of 65 – 70%)
- Third test after 14th week of semester (syllabus completion of 90 – 100%)

The average score of three test is taken and scaled down to **15 Marks.**

Continuous and Comprehensive Assessment (CCA):
Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **10 Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is **10 Marks**
Total Marks scored for theory component of CIE (IAT+ CCA) is **25 Marks**

CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **10 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester and **5 Marks** for conducting Open Ended Experiments.
- The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks conduction(Observation Book) and 5 Marks for Record Book. Marks of all experiments' write-ups and conduction are added and scaled to **10 Marks.**
- The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **10 Marks.**
- Open Ended Experiments are conducted after the completion of regular Experiments/Programs for 20 Marks and scaled down to **5 Marks**
- Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**.
- The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component.
- The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks.

The theory component of the IC shall be for both CIE and SEE.

Semester End Examination (SEE):

- Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**
- The question paper shall be set for 100 Marks. The medium of the question paper shall be English. The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**.
- 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. The two questions should be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory					Practical
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	10	-	-			-
Understand	20	10	-			-
Apply	20	20	10			20
Analyse	-	20	20			-
Evaluate	-	-	20			-
Create	-	-	-			30

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	25	25				50	33.3%
CO2			25			25	16.6%
CO3				25		25	16.6%
CO4					50	50	33.3%
CO5	5	5	5	5	5	25	25% (Lab)
Total	25	25	25	25	50	150	100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	--
Understand	10
Apply	15
Analyse	15
Evaluate	--
Create	10

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	10	10	--	--	--	20	20%
CO2	10	10	10	--	--	30	30%
CO3	--	--	10	10	--	20	20%
CO4	--	--	--	--	20	20	20%
CO5	--	3	2	3	2	10	10%
Total	20	23	22	13	22	100	100%

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**2nd**				
Course Title	:	**Professional Writing Skills in English**				
Course Code	:	**23CENC26**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Course Category	:	**HSSC**				
Stream	:	**Common to All Branches**		**CIE**	:	**50 Marks**
Teaching hr/week (L: T:P:S)	:	**1:0:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**15 Hrs**		**SEE Duration**	:	**2 Hours**
Credits	:	**1**				

Course Learning Objectives: Students will be taught.

Sl.No	Course Objectives
1	To Identify the Common Errors in Writing and Speaking of English
2	To Achieve better technical writing and Presentation skills.
3	To read technical proposals properly and make them to Write good technical reports
4	Acquire Employment and Workplace communication skills.
5	To learn about Techniques of Information Transfer through presentation in different level.

Teaching-Learning Process

Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyse information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Identifying Common Errors in Writing and Speaking English**: Common errors identification in parts of speech, Use of verbs and phrasal verbs, Auxiliary verbs and their forms, Subject Verb Agreement (Concord Rules), Common errors in Subject-verb agreement, Sequence of Tenses and errors identification in Tenses. Words Confused/Misused.	03
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation based learning (iii) Personalized learning (iv) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	
2	**Nature and Style of sensible writing**: Organizing Principles of Paragraphs in Documents, Writing Introduction and Conclusion, Importance of Proper Punctuation, Precise writing and Techniques in Essay writing, Sentence arrangements and Corrections activities. Misplaced modifiers, Contractions, Collocations, Word Order, Errors due to the Confusion of words.	03
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation based learning (iii) Personalized learning (iv) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	
3	**Technical Reading and Writing Practices**: Technical writing process, Introduction to Technical Reports writing, Significance of Reports, Types of Reports. Introduction to Technical Proposals Writing, Types of Technical Proposals, Characteristics of Technical Proposals. Scientific Writing Process. Grammar – Voices and Reported Speech, Spotting Error & Sentence Improvement, Cloze Test and Theme Detection Exercises.	03
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation based learning (iii) Personalized learning (iv) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	

4	**Professional Communication for Employment**: Listening Comprehension, Types of Listening, Listening Barriers, Improving Listening Skills. Reading Comprehension, Tips for effective reading. Job Applications, Types of official/employment/business Letters, Resume vs. Bio Data, Profile, CV. Writing effective resume for employment, Emails, Blog Writing and Memos.	**03**
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation based learning (iii) Personalized learning (iv)) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	
5	**Professional Communication at Workplace**: Group Discussion and Professional Interviews, Characteristics and Strategies of a GD and PI's, Intra and Interpersonal Communication Skills at workplace, Non-Verbal Communication Skills and its importance in GD and Interview. Presentation skills and Formal Presentations by Students, Strategies of Presentation Skills.	**03**
Pedagogy	(i) Direct instructional method (Low/Old Technology) (ii) Enquiry and evaluation based learning (iii) Personalized learning (iv) Problems based learning through discussion (v) Chalk & Talk, Interaction, Live examples & Videos	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Professional Writing Skills in English" published by Fillip Learning – Education (ILS), Bangalore – 2022.
2	Functional English" (As per AICTE 2018 Model Curriculum) (ISBN-978-93-5350-047-4) Cengage learning India Pvt Limited [Latest Edition 2019].
3	English for Engineers by N.P.Sudharshana and C.Savitha, Cambridge University Press – 2018.
4	Technical Communication by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.
5	Technical Communication – Principles and Practice, Third Edition by Meenakshi Raman and Sangeetha Sharma, Oxford University Press 2017
6	High School English Grammar & Composition by Wren and Martin, S Chandh & Company Ltd – 2015
7	Effective Technical Communication – Second Edition by M Ashraf Rizvi, McGraw Hill Education (India) Private

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	To Identify the Common Errors in Writing and Speaking of English	Remember	L-1
CO2	To practice better Technical writing and Presentation skills.	Understand	L-2
CO3	To read Technical proposals properly and make them to Write good technical reports	Understand	L-2
CO4	Acquire Employment and Workplace communication skills.	Apply	L-3
CO5	To learn about Techniques of Information Transfer through presentation in different level	Understand	L-2

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	--	--	--	--	--	--	--	2	1	2	--	2	--	--
CO2	--	--	--	--	--	--	--	1	1	1	--	1	--	--
CO3	--	--	--	--	--	--	--	2	2	2	--	2	--	--
CO4	--	--	--	--	--	--	--	2	1	1	--	1	--	--
CO5	--	--	--	--	--	--	--	1	2	1	--	1	--	--

Weblinks and Video Lectures (e-Resources)	
1	https://drive.google.com/drive/folders/1rqloQbY2HWu7xbFSmaGU3YAc7Tbhc3b1
2	https://drive.google.com/file/d/1UbpxJBcZNFyCxMEK0KqpR6NjpNfd4e1n/view?usp=drive_link
3	https://drive.google.com/file/d/11GUI1amPCq75n8mHoGnc9qzv_OJFzCHM/view?usp=drive_link
4	https://drive.google.com/file/d/1RbPsNDA_ATiTXP_Tn8y2Udpc2NZTcvoy/view?usp=drive_link
5	https://drive.google.com/file/d/1brLXNdwBFugdZJ1B4_TtzN43_KhhZvZl/view?usp=drive_link

Constitution of India / Samskruthika Kannada / Communicative English / Professional writing skills in English/ Innovation Design & Thinking

1 Credit Courses – Theory

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) – I (MCQ)	Module - 1 & 2	50	(50+50+50) / 3	**15**	6	Average of Three Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) – II (MCQ)	Module - 3 & 4	50				
		Internal Assessment Test (IAT) – III (QUIZ)	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25

SEE		Theory exam – (MCQ Type)	Entire syllabus	50	----	50	18	SEE Exam is theory Exam with MCQ type Question Papers of 50 Questions with each question 1 Mark each. Examination duration is 1 Hour
CIE + SEE				100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

1 Credit Course – Theory	
	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). The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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. **Possible continuous and comprehensive assessment:** Crossword, Maize, Debate, Role Play, Community Service, Mind Map, Concept Map, Case Study, Group Discussions, Ideathon The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC). **Continuous Internal Evaluation (CIE):** The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**. **Internal Assessment test:** **The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels** Three Tests (MCQ) each of **50 Marks** • First test after 6th week of the semester (syllabus completion of 35 – 40%) • Second test after 10th week of semester (syllabus completion of 65 – 70%) • Third test after 14th week of semester (syllabus completion of 90 – 100%) The average score of three test is taken and scaled down to **25 Marks.** **Continuous and Comprehensive Assessment (CCA):** Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**. • CCA1 to be conducted after 4th week • CCA2 to be conducted after 9th week. • The evaluation of CCAs includes either through quiz or rubrics Total score for CCA is **25 Marks** Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks** **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject . • The question paper shall be set for 50 Marks. The medium of the question paper shall be English. **The duration of SEE is 01 hours.** • The question paper will have 50 MCQs **covering all modules**. The questions shall map with the course outcome, program outcome and Blooms RBT level.

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	18	18	17	**18**	**17**
Understand	16	13	15	**17**	**15**
Apply	8	9	10	**7**	**8**
Analyse	**8**	**10**	8	8	10
Evaluate	**--**	**--**	--	--	--
Create	**--**	**--**	--	--	--

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	19	5	--	--	5	29	25%
CO2	6	20	--	--	6	32	24%
CO3	--	--	17	7	5	29	21%
CO4	--	--	8	18	6	32	16%
CO5	--	--	--	--	28	28	14%
Total	25	25	25	25	50		100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	35%
Understand	30%
Apply	20%
Analyse	15%
Evaluate	--
Create	--

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	3	2	2	2	1	10	20%
CO2	4	3	2	3	3	15	30%
CO3	2	1	2	3	2	10	20%
CO4	2	3	2	1	2	10	20%
CO5	2	1	1	1	0	5	10%
Total	13	10	09	10	8	50	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Identifying Common Errors in Writing and Speaking English: Common errors identification in parts of speech	1
1	Use of verbs and phrasal verbs, Auxiliary verbs and their forms, Subject Verb Agreement (Concord Rules	1
1	Common errors in Subject-verb agreement, Sequence of Tenses and errors identification in Tenses. Words Confused/Misused	1
2	Nature and Style of sensible writing: Organizing Principles of Paragraphs in Documents, Writing Introduction and Conclusion	1
2	Importance of Proper Punctuation, Precise writing and Techniques in Essay writing, Sentence arrangements and Corrections activities	1
2	Misplaced modifiers, Contractions, Collocations, Word Order, Errors due to the Confusion of words	1
3	Technical Reading and Writing Practices: Technical writing process & Scientific Writing Process, Spotting Error & Sentence Improvement	1
3	Introduction to Technical Reports writing, Significance of Reports, Types of Reports, Cloze Test and Theme Detection Exercises	1
3	Introduction to Technical Proposals Writing, Types of Technical Proposals, Characteristics of Technical Proposals Grammar – Voices and Reported Speech	1
4	Listening Comprehension, Types of Listening, Listening Barriers, Improving Listening Skills. Reading Comprehension, Tips for effective reading	1
4	Job Applications, Types of official / employment / business Letters,	1
4	Resume vs. Bio Data, Profile, CV. Writing effective resume for employment, Emails, Blog Writing and Memos	1
5	Group Discussion and Professional Interviews, Characteristics and Strategies of a GD and PI's,.	1
5	Intra and Interpersonal Communication Skills at workplace, Non-Verbal Communication Skills and its importance in GD and Interview.	1
5	Presentation skills and Formal Presentations by Students, Strategies of Presentation Skills	1
	Revision	
Total		**15 Hrs**

Dayananda Sagar Academy of Technology & Management
(Autonomous Institute under VTU)

Semester	:	**1st ಸೆಮಿಸ್ಟರ್**				
Course Title	:	**ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ**				
Course Code	:	**23SBKC17**				
Course Type (Theory/Practical/Integrated)	:	**Theory**				
Course Category	:	**HSSC**				
Stream	:	**Common to all**		**CIE**	:	**50 Marks**
Teaching hr/week (L: T:P:S)	:	**1:0:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**15 Hrs**		**SEE Duration**	:	**2 Hours**
Credits	:	**1**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	**ವೃತ್ತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.**
2	**ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸುವುದು.**
3	**ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.**
4	**ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳು ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.**
5	**ಸಾಂಸ್ಕೃತಿಕ ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.**

Teaching-Learning Process
Pedagogy (General Instructions):
These are sample Strategies; which teachers can use to accelerate the attainment of the various course outcomes.

1. Lecture method (L) does not mean only the traditional lecture method, but a different type ofteaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in theprinciple.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes criticalthinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, developthinking skills such as the ability to evaluate, generalize, and analyze information rather thansimply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come upwith their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helpsimprove the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	1) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ – ಹಂಪ ನಾಗರಾಜಯ್ಯ 2) ಕರ್ನಾಟಕ ಏಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ – ಜಿ. ವೆಂಕಟ ಸುಬ್ಬಯ್ಯ 3) ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ - ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೊಫಸರ್ ವಿ ಕೇಶವಮೂರ್ತಿ	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ಕಕ ಆಧರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿ ಕಾವ್ಯಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಭೋದನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	
2	1) ವಚನಗಳು : ಬಸವಣ್ಣ , ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮ ಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ, ಜೇಡರ ದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ. 2) ಕೀರ್ತನೆಗಳು : ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ – ಪುರಂದರ ದಾಸರು, ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೇ – ಕನಕದಾಸರು. 3) ತತ್ಪಪದಗಳು – ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು – ಶಿಶುನಾಳ ಶರೀಫ.	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ಕಕ ಆಧರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿ ಕಾವ್ಯಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಭೋದನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	

3	1) ಡಿ.ವಿ.ಜಿ ಯವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಆಯ್ದ ಕೆಲವು ಭಾಗಗಳು. 2) ಕುರುಡು ಕಾಂಚಾಣ – ದಾ.ರಾ.ಬೇಂದ್ರೆ. 3) ಹೊಸಬಾಳಿನ ಗೀತೆ – ಕುವೆಂಪು.	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ತಕ ಆಧರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿ ಕಾವ್ಯಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಭೋದನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	
4	1) ಡಾ. ಸರ್.ಎಮ್.ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ – ಎ ಎನ್ ಮೂರ್ತಿ ರಾವ್. 2) ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ – ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ.	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ತಕ ಆಧರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿ ಕಾವ್ಯಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಭೋದನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	
5	1) ಯುಗಾದಿ – ವಸುಧೇಂದ್ರ. 2) ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ – ಡಾ. ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ತಕ ಆಧರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿ ಕಾವ್ಯಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಭೋದನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ- ಡಾ.ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ. ಎಲ್.ತಿಮ್ಮೇಶ್ (
2	ಶ್ರೀ ಆರ್ ಮಂಜುನಾಥ್ ಹಾಗೂ ಪಿ. ನಾಗರಾಜ
3	ಡಾ. ಪ್ರಾಶಾಂತ್ ಜಿ ನಾಯಕ ಮತ್ತು ಶ್ರೀ ಟಿ.ಎಲ್. ರವೀಂದ್ರ

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	ಕನ್ನಡ ಭಾಷೆ ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಕುರಿತು ಅರಿವು ಮೂಡಿರುತ್ತದೆ.	ಸ್ಮರಿಸುವುದು	L-2
CO2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆದುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಕಲಿತು ಹೆಚ್ಚಿನ ಓದಿಗೆ ಮತ್ತು ಜ್ಞಾನಕ್ಕೆ ಸ್ಪೂರ್ತಿ ಮೂಡುತ್ತದೆ.	ಅರ್ಥೈಸಿಕೊಳ್ಳುವುದು	L-2
CO3	ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿ ಹೆಚ್ಚಾಗುತ್ತದೆ.	ಸ್ಮರಿಸುವುದು	L-1
CO4	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ ಹಾಗೂ ಅವರುಗಳು ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಂಡು ನಾಡಿನ ಇನ್ನಿತರ ವ್ಯಕ್ತಿಗಳ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳಲು ಕೌತುಕತೆ ಹೆಚ್ಚಾಗುತ್ತದೆ .	ಅರ್ಥೈಸಿಕೊಳ್ಳುವುದು	L-1
CO5	ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.	ಅರ್ಥೈಸಿಕೊಳ್ಳುವುದು	L-2

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	--	--	--	--	--	--	--	--	1	2	--	2	--	--
CO2	--	--	--	--	--	--	--	--	2	2	--	2	--	--
CO3	--	--	--	--	--	--	--	--	2	1	--	1	--	--
CO4	--	--	--	--	--	--	--	--	2	1	--	1	--	--
CO5	--	--	--	--	--	--	--	--	1	2	--	2	--	--

Weblinks and Video Lectures (e-Resources)	
1	https://youtu.be/S4w3FLZxY_A
2	https://youtu.be/XEMiYE3E3i8
3	https://youtu.be/RboxwA8KerM
4	https://youtu.be/3eE8XTePzTI
5	https://youtu.be/YzS26-ezxO8

Constitution of India / Samskruthika Kannada / Communicative English / Professional writing skills in English/ Innovation Design & Thinking

1 Credit Courses – Theory

Assessment Method	Component	Type of Assessments	Syllabus Coverage	Maximum Marks	Average	Reduced Marks	Minimum Passing Marks	Evaluation Details
Total CIE Theory				**50**	----	----	**20**	
CIE	**Theory**	Internal Assessment Test (IAT) – I (MCQ)	Module - 1 & 2	50	(50+50+50) / 3	**15**	6	Average of Three Internal test each of 50 Marks scale down the marks to 15
		Internal Assessment Test (IAT) – II (MCQ)	Module - 3 & 4	50				
		Internal Assessment Test (IAT) – III (QUIZ)	Module - 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**10**	4	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				

	Total CIE Theory					**25**	10	Scale down Marks of IAT and CCA to 25
SEE		Theory exam – (MCQ Type)	Entire syllabus	50	----	50	18	SEE Exam is theory Exam with MCQ type Question Papers of 50 Questions with each question 1 Mark each. Examination duration is 1 Hour
CIE + SEE				100	----	----	40	

- The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component.
- The Laboratory Component for the IPCC shall be for CIE only.
- However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.

1 Credit Course - Theory	
	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). The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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. **Possible continuous and comprehensive assessment:** Crossword, Maize, Debate, Role Play, Community Service, Mind Map, Concept Map, Case Study, Group Discussions, Ideathon The faculty may adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC). **Continuous Internal Evaluation (CIE):** The CIE Marks for the internal assessment test shall be **25 Marks** and for the continuous and comprehensive assessment (CCA) shall be **25 Marks**. **Internal Assessment test:** **The IA test questions are to be framed to map the course outcomes, program outcomes and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels** Three Tests (MCQ) each of **50 Marks** • First test after 6th week of the semester (syllabus completion of 35 – 40%) • Second test after 10th week of semester (syllabus completion of 65 – 70%) • Third test after 14th week of semester (syllabus completion of 90 – 100%) The average score of three test is taken and scaled down to **25 Marks.** **Continuous and Comprehensive Assessment (CCA):** Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to **25 Marks**. • CCA1 to be conducted after 4th week • CCA2 to be conducted after 9th week. • The evaluation of CCAs includes either through quiz or rubrics Total score for CCA is **25 Marks** Total Marks scored for theory component of CIE (IAT + CCA) is **50 Marks** **Semester End Examination (SEE):** • Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject . • The question paper shall be set for 50 Marks. The medium of the question paper shall be English. **The duration of SEE is 01 hours.** • The question paper will have 50 MCQs **covering all modules**. The questions shall map with the course outcome, program outcome and Blooms RBT level.

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				
	Continuous Assessment Tests			Continuous Comprehensive Assessment (CCA)	
	IAT-1	IAT-2	IAT-3	CCA-1	CCA-2
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember	18	17	18	**18**	**18**
Understand	16	15	13	**15**	**17**
Apply	8	10	8	**9**	**7**
Analyse	**8**	**8**	10	10	8
Evaluate	**-**	**-**	-	-	-
Create	**-**	**-**	-	-	-

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2		Test-3		
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	18	6	-	-	2	26	20%
CO2	7	19	-	-	2	28	25%
CO3	-	-	17	7	8	32	20%
CO4	-	-	8	18	8	34	20%
CO5	-	-	-	-	30	30	15%
Total	25	25	25	25	25	-	100%

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	35%
Understand	25%
Apply	20%
Analyse	20%
Evaluate	--
Create	--

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	2	1	1	0	1	5	10%
CO2	2	3	2	1	2	10	20%
CO3	2	1	2	3	2	10	20%
CO4	4	3	2	3	3	15	30%
CO5	3	2	2	2	1	10	20%
Total	13	10	9	10	8	50	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	ಕರ್ನಾಟಕಸಂಸ್ಕೃತಿ – ಹಂಪನಾಗರಾಜಯ್ಯ	1
2	ಕರ್ನಾಟಕಏಕೀಕರಣ : ಒಂದುಅಪೂರ್ವಚರಿತ್ರೆ – ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯ	1
3	ಆಡಳಿತಭಾಷೆಯಾಗಿಕನ್ನಡ - ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶಮತ್ತುಪ್ರೊಫಸರ್‌ವಿಕೇಶವಮೂರ್ತಿ	1
4	ವಚನಗಳು : ಬಸವಣ್ಣ , ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿಲಕ್ಕಮ್ಮ.	1
5	ಕೀರ್ತನೆಗಳು : ಅದರಿಂದೇನುಫಲಇದರಿಂದೇನುಫಲ – ಪುರಂದರದಾಸರು, ತಲ್ಲಣಿಸದಿರುಕಂಡ್ಯತಾಳುಮನವೇ – ಕನಕದಾಸರು.	1
6	ತತ್ವಪದಗಳು – ಸಾವಿರಕೊಡಗಳಸುಟ್ಟು – ಶಿಶುನಾಳಶರೀಫ.	1
7	ಡಿ.ವಿ.ಜಿಯವರಮಂಕುತಿಮ್ಮನಕಗ್ಗದಿಂದಆಯ್ದಕೆಲವುಭಾಗಗಳು.	1
8	ಕುರುಡುಕಾಂಚಾಣ – ದಾ.ರಾ.ಬೇಂದ್ರೆ.	1
9	ಹೊಸಬಾಳಿನಗೀತೆ – ಕುವೆಂಪು	1
10	ಡಾ. ಸರ್.ಎಮ್.ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿಮತ್ತುಐತಿಹ್ಯ – ಎಎನ್‌ಮೂರ್ತಿರಾವ್.	1½
11	ಕರಕುಶಲಕಲೆಗಳುಮತ್ತುಪರಂಪರೆಯವಿಜ್ಞಾನ – ಕರೀಗೌಡಬೀಚನಹಳ್ಳಿ	1½
12	ಯುಗಾದಿ – ವಸುಧೇಂದ್ರ.	1½
13	ಮೆಗಾನೆಎಂಬಗಿರಿಜನಪರ್ವತ – ಡಾ. ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ	1½
Total		15 Hrs

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**1st**				
Course Title	:	**Engineering Mathematics – I for CSE Stream**				
Course Code	:	**BMATS101**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Course Category	:	**ASC**				
Stream	:	**CSE & Allied branches**		**CIE**	:	**50 Marks**
Teaching hour/week (L: T:P:S)	:	**3:2:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**50 Hrs**		**SEE Duration**	:	**3 Hours**
Credits	:	**4**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	Acquire basic knowledge of mathematical concepts for understanding engineering problems
2	Use concepts of calculus, differential equations and numerical methods in solving problems
3	Analyze problems using concepts of calculus, differential equations and numerical methods
4	Use MATLAB to obtain solutions of various mathematical problems

Teaching-Learning Process Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Partial differentiation** Partial derivatives, total derivatives-differentiation of composite functions, maxima and minima for a function two variables, Jacobians, Hessian matrix.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
2	**Ordinary Differential Equations of first order** Linear differential equation, Bernoulli's equation, exact differential equations and reducible to exact differential equation, Newton's law of cooling- problems, rate of decay of radioactive materials, chemical reactions and solutions, LR circuits	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
3	**Ordinary Differential Equations of second and higher order** Second and higher order differential equations, inverse differential operator, Legendre's differential equations, method of variation of parameters, LC Circuits and LCR Circuits, deflection of beams	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
4	**Numerical solution of Ordinary Differential Equations** Introduction to Taylor's series, Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order, Milne's predictor and corrector method, Milne's method for second order differential equations.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
5	**Partial differential equations** Formation of partial differential equation, solution of PDE by direct integration, numerical solution of Laplace equation using standard five-point formula, numerical solution of heat equation by Schmidt explicit formula, numerical solution of the wave equation.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	

List of Experiments or Programs

Sl.No	Experiments/Programs	COs
	NIL	

Text Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Advanced Engineering Mathematics, Erwin Kreyzig, Wiley Publications, 10th Edition, 2015
2	Numerical Methods, M. K. Jain, S. R. K. Iyengar, R. K. Jain, New Age Publications, 6th Edition, 2012
3	Theory and problems of Differential and integral calculus, Frank Ayres and Elliott Mendelson, Schaum's outline series, McGraw Hill publications, 3rd Edition,1990
4	Higher Engineering Mathematics, B. S. Grewal, Khanna Publications, 44th Edition, 2021

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Advanced mathematics for Engineers and Scientists, Murray R Spiegel, Schaum's outline series, McGraw Hill publications.
2	Higher Engineering Mathematics, H. K. Dass and Er. Rajnish Verma, S. Chand Publication, 3rd Edition
3	Higher Engineering Mathematics, B.V. Ramana, McGraw-Hill Education, 11th Edition, 2017
4	Engineering Mathematics, Srimanta Pal & Subodh C.Bhunia , Oxford University Press, 3rd Edition, 2016.
5	A Textbook of Engineering Mathematics, N.P Bali and Manish Goyal, Laxmi Publications, 10th Edition, 2022.

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Understand the basic concepts of calculus, differential equations and numerical methods	Understand	L2
CO2	Apply techniques of concepts of calculus, differential equations and numerical methods to solve Engineering Problems	Apply	L3
CO3	Analyze Engineering problems using concepts of calculus, differential equations and numerical methods	Analyse	L4
CO4	Develop mathematical solutions to various real time problems using MATLAB	Evaluate	L5

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1													--	--
CO2	3												--	--
CO3		2											--	--
CO4			2		2				1	1			--	--

Weblinks and Video Lectures (e-Resources)	
1	https://archive.nptel.ac.in/courses/111/101/111101153/
2	https://nptel.ac.in/courses/111103021
3	https://nptel.ac.in/courses/111106101
4	https://archive.nptel.ac.in/courses/111/107/111107105/

Assessment Pattern (both CIE and SEE)

Applied Science Courses								
3 credits - Theory								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Theory + Practical				**50**			**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module – 1, 2 & 3(half module)	50	(50+50) / 2	**25**	10	Average of Two Internal test each of 50 Marks scale down the marks to 25 Marks
		Internal Assessment Test (IAT) - II	Module - 3(half module), 4 & 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**50**	20	Scale down Marks of IAT and CCA to 50

SEE		Theory exam	Entire theory syllabus including questions from lab component	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	
				• The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component. • The Laboratory Component for the IPCC shall be for CIE only. • However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.				

The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:
Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.
The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):
The CIE Marks for the theory component of the IC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IC
Internal Assessment test:

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Two Tests each of **50 Marks** scaled down to **25 Marks**

- First test after 7th week of the semester (syllabus completion of 50%)
- Second test after 14th week of semester (syllabus completion of 100%)

The average score of two tests is taken and scaled down to **25 Marks.**

Continuous and Comprehensive Assessment (CCA):
Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to 25 **Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is 25 **Marks**
Total Marks scored for theory component of CIE (IAT+ CCA) is **50 Marks**

CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **10 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester and **5 Marks** for conducting Open Ended Experiments.
- The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks conduction(Observation Book) and 5 Marks for Record Book. Marks of all experiments' write-ups and conduction are added and scaled to **10 Marks.**
- The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **10 Marks.**
- Open Ended Experiments are conducted after the completion of regular Experiments/Programs for 20 Marks and scaled down to **5 Marks**
- Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**.
- The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component.
- The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks.

The theory component of the IC shall be for both CIE and SEE.

Semester End Examination (SEE):

- Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**
- The question paper shall be set for 100 Marks. The medium of the question paper shall be English. The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**.
- 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. The two questions should be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				Practical
	Continuous Assessment Tests		Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember			30		
Understand	10	10	20		
Apply	30	30			
Analyse	10	10			
Evaluate				50	
Create					

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module-3	Module-3	Module-4	Module-5		
CO1	5	5	5		5	5	25	25%
CO2	10	10	5	5	10	10	50	50%
CO3	5	5		5	5	5	25	25%
CO4								
CO5								
CO6								
Total	20	20	10	10	20	20	100	

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	
Understand	5
Apply	35
Analyse	10
Evaluate	
Create	

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	5					5	10%
CO2	5	5	10	5	10	35	70%
CO3		5			5	10	20%
CO4							
CO5							
CO6							
Total	10	10	10	10	10	50	

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Introduction to the Course and syllabus	1
1	Partial derivatives- Definition and problems	1
1	Problems continued on above	1
1	Total Derivatives- problems	1
1	Partial Differentiation of Composite functions	1
1	Jacobians – Definition and problems	1
1	Definition and problems	1
1	Maxima and Minima for a function of two variables	1
1	Problems continued on above	1
1	Hessian matrix and problems	1
2	Linear differential equations of first order and first degree	1
2	Bernoulli's equation and problems	1
2	Exact equations and reducible to exact	1
2	Newton's law of cooling and problems	1

2	Rate of decay of radioactive materials	**1**
2	Chemical reactions and solutions	**1**
2	Problems continued on the above	**1**
2	LR Circuits	**1**
2	Problems continued on the above	**1**
2	Problems continued on the above	**1**
3	Second and higher order differential equations	**1**
3	Inverse differential operator, three types, problems on type-I,	**1**
3	Problems on type-II	**1**
3	Problems on type-III	**1**
3	Legendre's differential equation and problems	**1**
3	Method of variation of parameters-problems	**1**
3	LCR Circuits-problems	**1**
3	Defection of beams-problems	**1**
3	Problems on the above type	**1**
3	Problems on the above type	**1**
4	Introduction to Taylor's series	**1**
4	Numerical solution of ODE by Taylor's series method	**1**
4	Modified Euler's method and problems	**1**
4	Problems continued on the above	**1**
4	Runge-Kutta method of fourth order	**1**
4	Problems continued on the above	**1**
4	Milne's predictor and corrector method and problems	**1**
4	Problems continued on the above	**1**
4	Milne's method for second order differential equations	**1**
4	Problems continued on the above	**1**
5	Formation of partial differential equation-elimination of arbitrary constants	**1**
5	Formation of Partial Differential Equation-elimination of arbitrary functions	**1**
5	solution of PDE by direct integration	**1**
5	Problems continued on the above	**1**
5	Numerical solution of Laplace equation using standard five-point formula,	**1**
5	Problems continued on the above	**1**
5	Numerical solution of heat equation by Schmidt explicit formula	**1**
5	Problems continued on the above	**1**
5	Numerical solution of the wave equation	**1**
5	Problems continued on the above	**1**
		50 Hrs

Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	**2nd**				
Course Title	:	**Engineering Mathematics – II for CSE Stream**				
Course Code	:	**BMATS201**				
Course Type (Theory/ Practical/ Integrated)	:	**Theory**				
Course Category	:	**ASC**				
Stream	:	**CSE & Allied branches**		**CIE**	:	**50 Marks**
Teaching hour/week (L: T:P:S)	:	**3:2:0:0**		**SEE**	:	**50 Marks**
Total Hours	:	**50 Hrs**		**SEE Duration**	:	**3 Hours**
Credits	:	**4**				

Course Learning Objectives: Students will be taught

Sl.No	Course Objectives
1	Acquire basic knowledge of mathematical concepts for understanding Engineering problems
2	Use concepts of vector and integral calculus, transform calculus and numerical methods in solving problems
3	Analyze problems using concepts of vector and integral calculus, transform Calculus and numerical methods
4	Use MATLAB to obtain solutions of various mathematical problems

Teaching-Learning Process Pedagogy (General Instructions):

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
3. Encourage collaborative (Group) Learning in the class.
4. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
9. Individual teachers can device innovative pedagogy to improve teaching-learning.

DSATM

Scheme of Teaching and Examinations for BE Programme -2023-24
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2023-24)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	**Numerical methods** Solution of polynomial and transcendental equations - Newton-Raphson method and Regula Falsi method, finite differences, interpolation/extrapolation using Newton's forward and backward difference formulae, Newton's divided difference and Lagrange's formulae, numerical Integration-Simpson's one-third rule and Simpson's three-eighth rule.	**10**
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
2	**Integral Calculus** Multiple integrals, evaluation of double and triple integrals, evaluation of double integrals-change of order of integration, change of variables, area using double and volume using triple integrals.	**10**
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
3	**Vector Calculus** Vector differentiation: Scalar and vector fields, gradient, directional derivative, curl and divergence-physical interpretation, solenoidal and irrotational vector fields. Vector integration: Line integrals, surface and volume integral, theorems of Green, Gauss and Stokes, applications to work done by a force and flux.	**10**
Pedagogy	**Chalk and board, group discussion, ppt, videos**	
4	**Laplace transform:** Definition, transforms of elementary functions, Laplace transform of $e^{at}f(t)$, $t^n f(t)$, $\frac{1}{t} f(t)$, derivatives, Laplace transform of periodic functions, unit step function.	**10**
Pedagogy	**Chalk and board, group discussion, ppt, videos**	

5	**Inverse Laplace transform**: Inverse Laplace transform, convolution theorem and problems. applications –solution of Linear differential equations using Laplace transform.	**10**
Pedagogy	**Chalk and board, group discussion, ppt, videos**	

List of Experiments or Programs

Sl.No	Experiments/Programs	COs
	NIL	

Text Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Advanced Engineering Mathematics, Erwin Kreyzig, Wiley Publications, 10th Edition, 2015
2	Numerical Methods, M. K. Jain, S. R. K. Iyengar, R. K. Jain, New Age Publications, 6th Edition, 2012
3	Theory and problems of Differential and integral calculus, Frank Ayres and Elliott Mendelson, Schaum's outline series, McGraw Hill publications, 3rd Edition,1990
4	Higher Engineering Mathematics, B. S. Grewal, Khanna Publications, 44th Edition, 2021

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Advanced mathematics for Engineers and Scientists, Murray R Spiegel, Schaum's outline series, McGraw Hill publications.
2	Higher Engineering Mathematics, H. K. Dass and Er. Rajnish Verma, S. Chand Publication, 3rd Edition
3	Higher Engineering Mathematics, B.V. Ramana, McGraw-Hill Education, 11th Edition, 2017
4	Engineering Mathematics, Srimanta Pal & Subodh C.Bhunia , Oxford University Press, 3rd Edition, 2016.
5	A Textbook of Engineering Mathematics, N.P Bali and Manish Goyal, Laxmi Publications, 10th Edition, 2022.

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Understand the basic concepts of vector calculus, integral calculus, transform calculus and numerical methods	**Understand**	**L2**
CO2	Apply techniques of vector calculus, integral calculus, transform calculus and numerical methods to solve Engineering Problems	**Apply**	**L3**
CO3	Analyze Engineering problems using vector calculus, integral calculus, transform calculus and numerical methods	**Analyse**	**L4**
CO4	Develop mathematical solutions to various real time problems using MATLAB	**Evaluate**	**L5**

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1														
CO2	3													
CO3		1												
CO4			2		2				1	1				

Weblinks and Video Lectures (e-Resources)	
1	https://youtube.com/playlist?list=PLMLsjhQWWlUoOGgo64vgzFfAcFpQeJzhX
2	https://youtube.com/playlist?list=PLMLsjhQWWlUpGtORaLzBlvw_QkpYCgoBa
3	https://youtube.com/playlist?list=PLMLsjhQWWlUrfmcsh0kJl8m6Esfz4TpU_
4	https://youtube.com/playlist?list=PLMLsjhQWWlUqSNC042WJpBS6zWFx9biwR
5	https://youtube.com/playlist?list=PLhSp9OSVmeyKQu9bO27NN_2wlyiHUX2-f

Assessment Pattern (both CIE and SEE)

Applied Science Courses								
4 credits - Theory								
Assessment Method	**Component**	**Type of Assessments**	**Syllabus Coverage**	**Maximum Marks**	**Average**	**Reduced Marks**	**Minimum Passing Marks**	**Evaluation Details**
Total CIE Theory + Practical				**50**			**20**	
CIE	**Theory**	Internal Assessment Test (IAT) - I	Module – 1, 2 & 3(half module)	50	(50+50) / 2	**25**	10	Average of Two Internal test each of 50 Marks scale down the marks to 25 Marks
		Internal Assessment Test (IAT) - II	Module - 3(half module), 4 & 5	50				
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	50	(50+50) / 2	**25**	10	Two CCA methods as per VTU Clause 22OB4.2 of regulations to be adopted. If CCA chosen is Project Based Learning, then one assessment method may be adopted
		CCA-2- Pedagogical Initiatives		50				
	Total CIE Theory					**50**	20	Scale down Marks of IAT and CCA to 50

SEE		Theory exam	Entire theory syllabus including questions from lab component	100	----	50	20	SEE Exam is theory Exam conducted for 100 Marks, scored Marks are scaled down to 50 Marks
CIE + SEE				100	----	----	40	
				• The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks – 25) in the Practical component. • The Laboratory Component for the IPCC shall be for CIE only. • However, in SEE, the Questions from the Laboratory Component shall be included in the respective Modules only.				

The Minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of Maximum Marks – 25) in the Theory Component and 10 (40% of Maximum Marks -25) in the Practical Component. The Laboratory Component of the IPCC shall be for CIE only. However, in SEE the questions from the Laboratory Component shall be included in the respective Modules only.

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).
The minimum passing mark for the SEE is 35% of the maximum Marks (18 Marks out of 50).
A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and 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.

Possible continuous and comprehensive assessment:

Project based, Problem Based, Building Models, Lab-to-Land, Mobile Studio, Design and Programming Contest, Certification, Concept Map (Collage presentation/poster presentation), Case studies, Think-Pair-Share, Flipped classroom, storytelling. The assessment of these techniques can be either based on Quiz or rubrics.
The faculty can adopt any other CCA method of implementation and its assessment with prior approval of Program Assessment Committee (PAC).

Continuous Internal Evaluation (CIE):

The CIE Marks for the theory component of the IC shall be **25 Marks** and for the laboratory component **25 Marks**.

CIE for the theory component of the IC
Internal Assessment test:

The IA test questions are to be framed to map the Course Outcomes (COs), Program Outcomes (POs) and the Blooms RBT Levels. Emphasis to be given for higher order RBT levels

Two Tests each of **50 Marks** scaled down to **25 Marks**

- First test after 7th week of the semester (syllabus completion of 50%)
- Second test after 14th week of semester (syllabus completion of 100%)

The average score of two tests is taken and scaled down to **25 Marks.**

Continuous and Comprehensive Assessment (CCA):

Two of continuous and comprehensive assessment (CCA) to be conducted to attain COs and POs, evaluated each for **50 Marks**. Total Marks scored will be CCA1+CCA2 and scaled down to 25 **Marks**.

- CCA1 after 4th week and CCA2 after 9th week. The evaluation includes either through quiz or rubrics
- CCA as project-based learning,
    - CCA is evaluated for **50 Marks** with review 1 of **20 Marks** after and review 2 of **30 Marks** includes project demonstration/competition and report submission.
    - The evaluation of review 1 after 6th weeks of semester and review 2 after 12th week of semester with project demonstration and submission of the report

Total score for CCA is 25 **Marks**
Total Marks scored for theory component of CIE (IAT+ CCA) is **50 Marks**

CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be evaluated and Marks shall be awarded on the same day. The **10 Marks** are for conducting the experiment and preparation of the laboratory record, the other **10 Marks shall be for the test** conducted at the end of the semester and **5 Marks** for conducting Open Ended Experiments.
- The CIE Marks awarded in the case of the practical component shall be based on the continuous evaluation of the laboratory report and the conduction. Each experiment report can be evaluated for 05 Marks conduction(Observation Book) and 5 Marks for Record Book. Marks of all experiments' write-ups and conduction are added and scaled to **10 Marks.**
- The Practical laboratory test **(duration 03 hours)** at the end of the 15th week of the semester/after completion of all the experiments (whichever is early) shall be conducted for **50 Marks** and scaled down to **10 Marks.**
- Open Ended Experiments are conducted after the completion of regular Experiments/Programs for 20 Marks and scaled down to **5 Marks**
- Scaled-down Marks of write-up, evaluations and tests, will be added as CIE Marks for the laboratory component of IC/IPCC for **25 Marks**.
- The minimum Marks to be secured in CIE to appear for SEE shall be 10 (40% of maximum Marks) in the theory component and 10 (40% of maximum Marks) in the practical component.
- The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included**.** The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total Marks of all questions should not be more than 25 Marks.

The theory component of the IC shall be for both CIE and SEE.

Semester End Examination (SEE):

- Theory SEE will be conducted as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**
- The question paper shall be set for 100 Marks. The medium of the question paper shall be English. The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 Marks. The student has to answer 5 full questions, selecting one full question from each module summing up to maximum score of 100 Marks. Marks **scored out of 100 shall proportionally be reduced to 50 Marks**.
- 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. The two questions should be of same course outcome, program outcome and Blooms RBT level. Emphasis to be given for higher order RBT levels

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory				Practical
	Continuous Assessment Tests		Continuous Comprehensive Assessment (CCA)		Practical Test
	IAT-1	IAT-2	CCA-1	CCA-2	
	50 Marks	50 Marks	50 Marks	50 Marks	50 Marks
Remember			30		
Understand	10	10	20		
Apply	30	30			
Analyse	10	10			
Evaluate				50	
Create					

CIE Course Assessment Plan

CO's	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module-1	Module-2	Module-3	Module-3	Module-4	Module-5		
CO1	5	5	5		5	5	25	25%
CO2	10	10	5	5	10	10	50	50%
CO3	5	5		5	5	5	25	25%
CO4								
CO5								
CO6								
Total	20	20	10	10	20	20	100	

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	
Understand	5
Apply	35
Analyse	10
Evaluate	
Create	

SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	5					5	10%
CO2	5	5	10	5	10	35	70%
CO3		5			5	10	20%
CO4							
CO5							
CO6							
Total	10	10	10	10	10	50	

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Introduction, Numerical Solution of algebraic and transcendental equations, Regula-Falsi method and problems	1
1	Newton - Raphson method and problems	1
1	Finite differences: Introduction, Forward & Backward differences	1
1	Problems continued on the above	1
1	Interpolation: Newton's forward and backward interpolation formulae	1
1	Interpolation formulae for the unequal intervals: Newton's divided difference formula	1
1	Lagrange's interpolation formula and problems	1
1	Numerical integration: Simpson's one-third, three-eighth and trapezoidal rules	1
1	Problems on the above rules	1
1	Problems continued	1
2	Multiple Integrals: Evaluation of double and triple integrals	1
2	Problems on above topic	1
2	Change of order of integration and problems	1

2	Problems continued on above topic	**1**
2	Problems continued	**1**
2	Changing into polar coordinates and problems	**1**
2	Problems continued on above topic	**1**
2	Application to find area and volume	**1**
2	Problems continued on above topic	**1**
2	Problems continued	**1**
3	Scalar and vector fields, gradient and physical interpretation	**1**
3	Gradient of a scalar and problems	**1**
3	Directional derivative and problems	**1**
3	Curl and divergence; physical interpretation	**1**
3	Solenoidal and irrotational vectors	**1**
3	Vector line integral and problems	**1**
3	Surface and volume integrals	**1**
3	Green's theorem and problems	**1**
3	Stoke's theorem and problems	**1**
3	Divergence theorem and problems	**1**
4	Introduction and definition of Laplace transform	**1**
4	Laplace transform of some standard functions	**1**
4	Problems on the above	**1**
4	Basic properties of Laplace transforms	**1**
4	Problems on the above	**1**
4	Problems on the above	**1**
4	Laplace transform of periodic functions	**1**
4	Problems on the above	**1**
4	Laplace transform of unit-step function: properties	**1**
4	Problems on the above	**1**
5	Inverse Laplace transforms	**1**
5	Problems on the above	**1**
5	Problems on the above	**1**
5	Problems on the above	
5	Convolution theorem	**1**
5	Problems on the above	**1**
5	Problems on the above	**1**
5	Solution of LDE using Laplace transform	**1**
5	Problems on the above	**1**
5	Problems on the above	**1**
	Total	**50 Hrs**