

DAYANANDA SAGAR ACADEMY OF TECHNOLOGY & MANAGEMENT



CURRICULUM

Scheme and Syllabus I & II Semester

Outcome Based Education

(Academic Year 2026-2027)

Department of Mechanical Engineering

1st & 2nd Semester B.E

ABOUT THE INSTITUTE

Dayananda Sagar Academy of Technology and Management- DSATM was established in 2011 with 5 UG Programmes and 1 PG Program, the programmes are approved by All India Council for Technical Education (AICTE) New Delhi, Affiliated to Visvesvaraya Technological University (VTU), Belagavi and DSATM is an autonomous institute from 2023-2024.

The Dayananda Sagar Institutions is one of pioneer institutions in India and abroad with six decades of excellence in Academic and Research. The newer campuses were necessary to accommodate the growing need of the technology and innovation.

DSATM nurtures the students in academic, research, sports, cultural and extracurricular activities.

- Creating an academic environment to nurture and develop competent entrepreneurs, leaders and professionals who are socially sensitive and environmentally conscious.
- Integration of Outcome Based Education and cognitive teaching and learning strategies to enhance learning effectiveness.
- Developing necessary infrastructure to cater to the changing needs of Business and Society.
- Optimum utilization of the infrastructure and resources to achieve excellence in all areas of relevance.
- Adopting learning beyond curriculum through outbound activities and creative assignments.
- Imparting contemporary and emerging techno-managerial skills to keep pace with the changing global trends.
- Facilitating greater Industry-Institute Interaction for skill development and employability enhancement.
- Establishing systems and processes to facilitate research, innovation and entrepreneurship for holistic development of students.
- Implementation of Quality Assurance System in all Institutional processes.

VISION OF THE INSTITUTE

To strive at creating the institution a centre of highest calibre of learning, so as to create an overall intellectual atmosphere with each deriving strength from the other to be the best of engineers, scientists with management & design skills.

MISSION OF THE INSTITUTE

- To serve its region, state, the nation and globally by preparing students to make meaningful contributions in an increasing complex global society challenges.
- To encourage, reflection on and evaluation of emerging needs and priorities with state-of-the-art infrastructure at institution.
- To support research and services establishing enhancements in technical, economic, human and cultural development.
- To establish interdisciplinary centre of excellence, supporting/ promoting student's implementation.
- To increase the number of Doctorate holders to promote research culture on campus.
- To establish IIPC, IPR, EDC, innovation cells with functional MOU's supporting student's quality growth.

QUALITY POLICY

Dayananda Sagar Academy of Technology and Management aims at achieving academic excellence through continuous improvement in all spheres of Technical and Management education. In pursuit of excellence cutting – edge and contemporary skills are imparted to the utmost satisfaction of the students and the concerned stakeholders.

ABOUT THE DEPARTMENT: The Department of Mechanical Engineering was established in the year 2011 to impart high quality mechanical skills to the blooming engineers of DSATM under the umbrella of “Dayananda Sagar Institutions”. The Department is committed to well-being and all-round development of its students and faculty. Research and Development center was established in the year 2016 which offers Ph.D. program Affiliated to VTU, Belagavi, facilitating research and consultancy works. The strength of the department lies in its highly qualified and experienced teaching faculty besides its supportive and excellent non-teaching staff, with state-of-the-art laboratory facilities. The department is engaged in sponsored research, consultancy and testing in the areas of advanced material’s development, processing, design, and their characterization and has a dedicated platform called MAKER SPACE where the students can execute their innovative ideas. The focus of our curriculum to the students is to promote technical competence, problem solving skills and innovation of new technologies like such as advanced composites, 3D Printing.

VISION OF THE DEPARTMENT

To endeavor the best quality of teaching and learning in advanced fields of mechanical engineering to cater the industrial demands and social needs.

MISSION OF THE DEPARTMENT

- M1: To provide the students with an academic environment of excellence, leadership, ethical guidelines for a successful career.**
- M2: To empower the students with personality development programs for advancement in their professional career.**
- M3: To impart practical oriented educational programs for the students which tend to promote the intellectual pursuit.**
- M4: To develop alliances with industry and alumni for excellence in teaching, research, and consultancy practices.**

PROGRAM EDUCATION OBJECTIVES (PEO'S):

- PEO 1: The graduates will be able to apply practical knowledge and career-based objectives to survive in advanced technological world
- PEO 2: The graduates are acquired with additional knowledge on interdisciplinary subjects and skills, leadership qualities to become a successful entrepreneur
- PEO 3: The graduates will be able to pursue their higher studies in specialized areas and advances of mechanical engineering & explore possible profession as an researchers, academicians, or self-employment
- PEO 4: All Graduates are made to undergo to do additional certified courses in the field of advanced technologies and interdisciplinary software's

PROGRAM OUTCOMES (PO's)

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO's)

ME PSO1

An ability to find out, articulate the local industrial problems and solve with the use of mechanical engineering tools for realistic outcomes.

ME PSO2

Ability to collaborative learning to find out cost-effective, optimal solution for social problems.



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

Affiliated to **VTU**
Approved by **AICTE**
Accredited by **NAAC** with **A+** Grade
6 Programs Accredited by **NBA**
(CSE, ISE, ECE, EEE, MECH, CV)

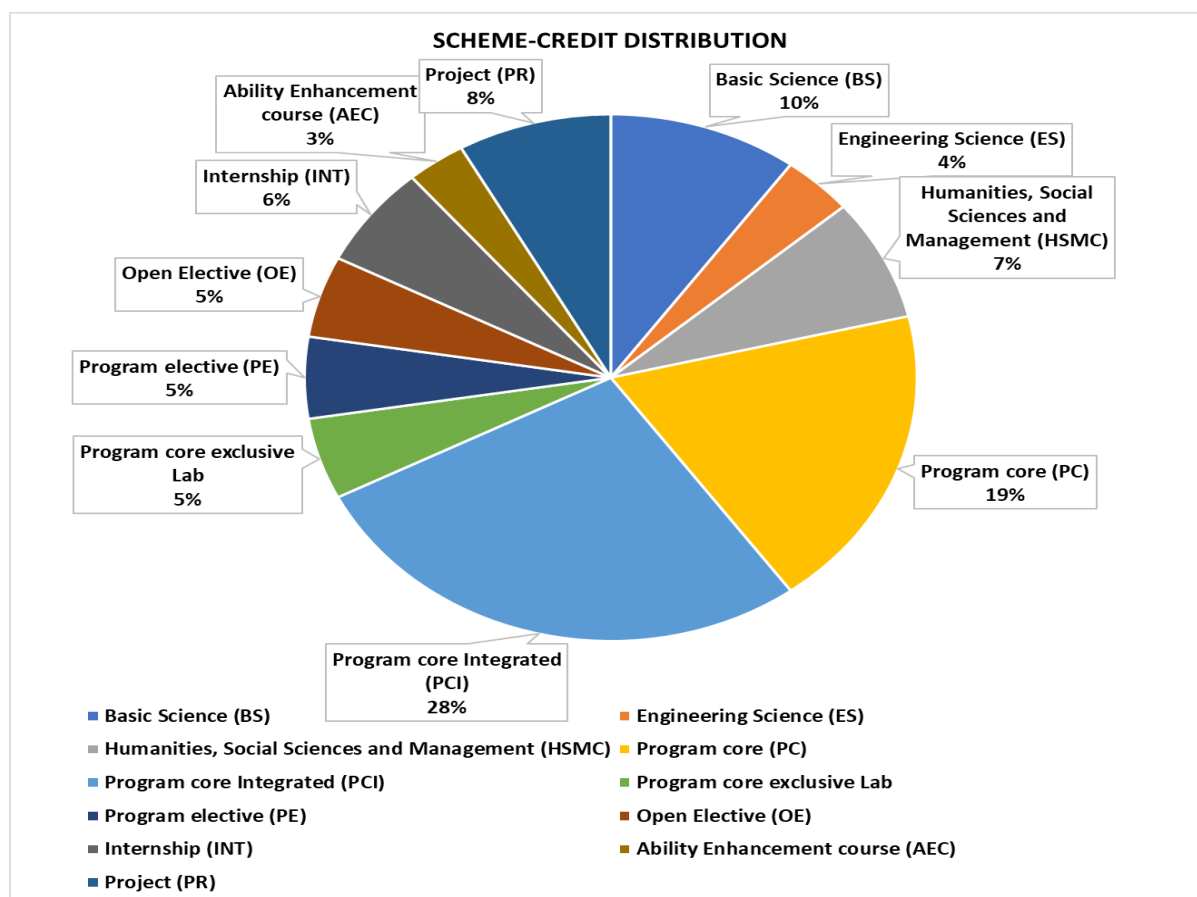
PROPOSED UG CREDIT STRUCTURE IN ALIGNMENT WITH VTU

Sl.No	Semester	No. of Credits
1	1 st Semester	20
2	2 nd Semester	20
3	3 rd Semester	21
4	4 th Semester	21
5	5 th Semester	22
6	6 th Semester	22
7	7 th Semester	20
8	8 th Semester	14
Total		160

SCHEME DISTRIBUTION

Department of Mechanical Engineering

Course Component	Credits	% of Credits
Basic Science (BS)	16	10
Engineering Science (ES)	6	4
Humanities, Social Sciences and Management (HSMC)	12	8
Program core (PC)	30	18
Program core Integrated (PCI)	44	28
Program core exclusive Lab	8	5
Program elective (PE)	8	5
Open Elective (OE)	8	5
Internship (INT)	10	6
Ability Enhancement course (AEC)	5	3
Project (PR)	13	8
Total	160	100



SEMESTER WISE CREDIT BREAKDOWN FOR B.E. DEGREE CURRICULUM

BATCH 2023-2027

Course Category	Semester								Total Credits
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	
Basic Sciences (BSC)	8	8	0	0	0	0	0	0	16
Engineering Sciences (ESC)	3	3	0	0	0	0	0	0	6
Humanities, Social Sciences and Management (HSMC)	3	3	3	3	0	0	0	0	12
Ability Enhancement Course (AEC)	2	2	0	0	3	0	0	0	7
Universal Human Values (UHV)	1	1	1	1	1	1	0	0	6
Professional Core Courses (PCC)	3	3	9	9	6	6	3	0	39
Integrated Professional core Course (IPCC)	0	0	8	8	4	4	4	0	28
Professional Elective Course (PEC)	0	0	0	0	3	3	3	0	9
Institutional Open Elective Courses (IOE)	0	0	0	0	3	4	3	0	10
Internship (INT)	0	0	0	0	0	0	0	10	14
Project Work (PW)	0	0	0	0	0	2	7	4	13
Non-credit Mandatory Courses (NCMC)	0	0	0	0	0	0	0	0	0
Total Credits	20	20	21	21	22	22	20	14	160



Scheme of Teaching and Examinations – 2026-27
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from 2026-27)

1st SEMESTER: CHEMISTRITY CYCLE (Mechanical Engineering Stream) – MECHANICAL ENGINEERING (MECH)

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	BMATS101	Engineering Mathematics-1	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	BCHES102	Applied Chemistry for Mechanical Engineering Stream	ASC	CHE	CHE	2	2	2	0	6	4	3	50	50	100
3	BCECV101	Introduction to Civil Engineering	CEC-1	CIV	CIV	3	0	0	0	3	3	3	50	50	100
4	BESCS101	Principles of Programming using C	ESC	CSE	CSE	2	0	2	0	4	3	3	50	50	100
5	BESCM102	Computer Aided Engineering Drawing	ESC	MED	MED	2	0	2	0	4	3	3	50	50	100
6	BCENC106	Communicative English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	BSBKC107	Samskruthika Kannada	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
8	BIDTC108	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 (Mechanical Engineering Stream) – MECHANICAL ENGINEERING (MECH)

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	BMATC201	Engineering Mathematics-2	ASC	MAT	MAT	3	2	0	0	5	4	3	50	50	100
2	BPBYS202	Applied Physics for Mechanical Engineering Stream	ASC	PHY	PHY	2	2	2	0	6	4	3	50	50	100
4	BCECM207	Elements of Mechanical Engineering	CEC-2	MED	MED	3	0	0	0	3	3	3	50	50	100
3	BETCS203	Introduction to AI and Applications	ETC	CSE	CSE	2	0	0	2	4	3	3	50	50	100
5	BPLCS201	Introduction to Python Programming	PLC	CSE	CSE	2	0	2	0	4	3	3	50	50	100
6	BCENC206	Professional writing skills in English	HSSC	HSS	HSS	1	0	0	0	1	1	2	50	50	100
7	BICNC207	Indian Constitution	HSSC	MED	MED	1	0	0	0	1	1	2	50	50	100
8	BEEXC208	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

IPCC: Integrated Professional Core Course,

PCC: Professional Core Course

PBL: Project Based Learning

AEC: Ability Enhancement Course,

NCMC: Non-Credit Mandatory Course

L: Lecture,

T: Tutorial,

P: Practical

S= SDA: Skill Development Activity,

CIE: Continuous Internal Evaluation,

SEE: Semester End Evaluation.

Integrated Professional Core Course (IPCC): Refers to Integrated Professional Core Course Theory Integrated with practical's of the same course. Credit for IPCC can be 04 and its Teaching Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper.

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

1st SEMESTER



Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	I				
Course Title	:	Engineering Mathematics – I for ME Stream				
Course Code	:	BMATM101				
Course Type (Theory/ Practical/ Integrated)	:	Theory				
Course Category	:	ASC				
Stream	:	ME		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, Linear Algebra and Numerical methods in solving problems
3	Analyze problems using concepts of Calculus, Linear Algebra 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 2025-26)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	Linear Algebra Elementary transformations on a matrix, echelon form & rank of a matrix, Gauss elimination, eigen values and eigen vectors of a matrix, Rayleigh power method, application of linear algebra to balance chemical equations.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
2	Numerical methods Solution of equations - Newton-Raphson method, finite differences, interpolation/extrapolation using Newton's forward and backward difference formulae, Newton's divided difference, numerical integration- Simpson's one-third rule and Simpson's three-eighth rule and application problems.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
3	Polar curves Cartesian and polar coordinates, polar curves, angle between polar curves, pedal equations, radius of curvature in cartesian and polar form.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
4	Partial differentiation Partial derivatives, total derivatives-differentiation of composite functions, Jacobians, application: maxima and minima for a function two variables.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
5	Vector Calculus Derivative of a vector, scalar and vector fields, gradient, directional derivative, curl and divergence-physical interpretation, solenoidal and irrotational vector fields, application: velocity and acceleration of a moving particle.	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	Linear Algebra, Seymour Lipschutz, Marc Lipson, Schaum's Outlines, Mc Graw Hill Publications, 4 th Edition
2	Numerical Methods, M. K. Jain, S. R. K. Iyengar, R. K. Jain, New Age Publications, 6 th Edition
3	Theory and problems of Differential and integral calculus, Frank Ayres and Elliott Mendelson, Schaum's outline series, McGraw Hill publications, 3 rd Edition
4	Higher Engineering Mathematics, B. S. Grewal, Khanna Publications, 44 th Edition

Reference 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, 10 th Edition.
2	Advanced mathematics for Engineers and Scientists, Murray R Spiegel, Schaum's outline series, McGraw Hill publications.
3	Higher Engineering Mathematics, H. K. Dass and Er. Rajnish Verma, S. Chand Publication, 3 rd 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 basic concepts of calculus, Linear Algebra and Numerical methods	Understand	L2
CO2	Apply techniques of Calculus, Linear Algebra and Numerical methods to solve Engineering Problems	Apply	L3
CO3	Analyze Engineering problems using Calculus, Linear Algebra 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
C01														
C02	3													
C03		1												
C04			2		2				1	1				

Weblinks and Video Lectures (e-Resources)

1	https://nptel.ac.in/courses/111105122
2	https://nptel.ac.in/courses/111103021
3	https://nptel.ac.in/courses/111106101

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	
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	Elementary transformations on a matrix	1
1	Echelon form of a matrix	1
1	Rank of a matrix	1
1	Gauss – elimination method to solve system of linear equations	1
1	Problems continued on the above	1
1	Eigen values and eigen vectors of a matrix	1
1	Problems continued on the above	1
1	Problems continued on the above	1
1	Rayleigh power method to determine the dominant eigen value of a matrix	1
1	Problems continued on the above	1
2	Introduction, Numerical solution of algebraic and transcendental equations	1
2	Newton - Raphson method and problems	1
2	Problems continued on the above	1
2	Finite differences	1

2	Interpolation: Newton's forward and backward interpolation formulae	1
2	Problems continued on the above	1
2	Newton's divided difference formula	1
2	Problems continued on the above	1
2	Numerical integration: Simpson's one-third, three-eighth	1
2	Problems on the above rules	1
3	Cartesian and Polar coordinates	1
3	Polar Curves	1
3	Angle between two curves	1
3	Problems continued on the above	1
3	Pedal equations	1
3	Problems continued on the above	1
3	Radius of curvature in cartesian form	1
3	Problems continued on the above	1
3	Radius of curvature in polar form	1
3	Problems continued on the above	1
4	Partial derivatives- Definition and problems	1
4	Problems continued on above	1
4	Total Derivatives- problems	1
4	Partial Differentiation of Composite functions	1
4	Problems continued on above	1
4	Jacobians – Definition and problems	1
4	Problems continued on above	1
4	Maxima and Minima for a function of two variables	1
4	Problems continued on above	1
4	Problems continued on above	1
5	Scalar and vector fields	1
5	Gradient of a scalar and problems	1
5	Problems continued on above	1
5	Directional derivative and problems	1
5	Problems continued on above	1
5	Curl and divergence; physical interpretation	1
5	Problems continued on above	1
5	Solenoidal and irrotational vectors	1
5	Problems continued on above	1
5	Problems continued on above	1
		50 hrs



Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	1 st and 2 nd			
Course Title	:	Applied Chemistry for Mechanical Stream			
Course Code	:	BCHEM12 /BCHEM22			
Course Type (Theory/ Practical/ Integrated)	:	Integrated			
Category	:	ASC			
Stream	:	Mechanical		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, water technology and corrosion chemistry.
2	To understand the mechanism of corrosion, thermodynamics, kinetics and polymers to solve societal problems.
3	To learn significance of polymers, factors affecting corrosion, water analysis and purification techniques.
4	To provide in-depth knowledge of Engineering materials.

Teaching-Learning ProcessPedagogy (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.



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 ₃ OH-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	WATER TECHNOLOGY Water Chemistry and Sewage Water Treatment: Introduction, different sources of water, Water characteristics, Hardness, Types of hardness- Temporary and Permanent - Disadvantages of hard water, Units of hardness, Estimation of hardness-EDTA method (Numerical). Water Softening Methods: Principle, procedure and advantages of Ion exchange process (Types of membranes), Reverse osmosis. Dissolved oxygen (DO) -Estimation (Winkler's method), BOD and COD-definition, estimation and significance (Numerical). Sewage water treatment - Primary, Secondary and Tertiary - Flow diagram. Municipal water treatment: Disinfection methods - chlorination, ozone and UV irradiation.	8
Pedagogy	Experiments determining the hardness of water sample from different sources, PPT on water purification methods, Student's group discussion on sewage water treatment.	
4	POLYMERS AND FUELS Polymer chemistry: Introduction to polymers, Glass transition temperature (T_g), factors affecting T_g and its significance. Preparation, properties and applications of Kevlar, and Epoxy resin; Determination of molecular weight of polymers by number average and weight average method-numerical problems. Biodegradable polymer: Introduction, synthesis, properties, and application of polylactic acid (PLA). Conducting polymers: Mechanism of conduction in polyacetylene and applications Fuels: Definition, classification of fuels and characteristics of good fuels; Solid fuels: Coal, analysis of coal- proximate and ultimate analysis; Liquid fuels: Petroleum and its refining; Cracking: Fixed bed catalytic cracking; Knocking: Octane and cetane numbers; Combustion: Calorific value-Gross calorific value (GCV) and Net calorific value (NCV)-numerical problems	8
Pedagogy	Animated videos on polymer synthesis, PPT on biodegradable and conducting polymers, Assignment to collect different types of polymers with 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.
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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)
6	Kinetic study of the reaction of KI with $K_2S_2O_8$
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.
Demonstration Experiments (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.
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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 pvt 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=T4pSufIO9fk , 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 and First Half of Module 3	50	(50+50) / 2	15	6	Average of Two Internal test each of 50 Marks scale down the marks to 15 Marks	
		Internal Assessment Test (IAT) - II	Second half of Module 3, Module 4 & 5	50					
	Continuous Comprehensive Assessment (CCA)	CCA-1- Pedagogical Initiatives	Considering all the Modules	20	(20+20) / 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		20					
	Total CIE Theory						25	10	Scale down Marks of IAT and CCA to 25
				Continuous Evaluation of each experiment					Performance of the Experiment (On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be

CIE	Practical	Conduction of Experiments	Record	05	10	Average of all Experiments	10	4	awarded on the same day. 20 marks are for conducting the experiment and calculations/observations/output)
			Observation book	05					
		Practical Test	Write up	10	50	----	10	4	One Internal Practical Test after conduction of all Experiments for 50 Marks
			Execution	30					
			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
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
	Test-1	Test-2	CCA-1	CCA-2	
	50 Marks	50 Marks	20 Marks	20 Marks	50 Marks
Remember	10	10	--	--	--
Understand	20	20	--	--	--
Apply	20	20	5	5	10
Analyse	--	--	5	5	20
Evaluate	--	--	10	10	20
Create	--	--	--	--	--

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1			Test-2			
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	10	5	0/0	5	5	25	25%
CO2	10	10	5/5	10	5	45	45%
CO3	0	10	0/5	5	10	30	30%
CO4	--	--	--	--	--	--	--
CO5	--	--	--	--	--	--	--
CO6	--	--	--	--	--	--	--
Total	20	25	5/10	20	20	100	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	15%
Understand	50%

Apply	35%
Analyse	--
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	1
	Green Chemistry: Introduction, 12 principles with real life examples	
	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
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 SO _x and NO _x .	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	:	1 ST /2 nd				
Course Title	:	Introduction To Civil Engineering				
Course Code	:	BCECV101 / BCECV201				
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 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 devise 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: Foundation, 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 bldgs; 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	
	Transportation Engineering: Importance and classification of roads and railways, types of highway pavements and its	08

5	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.	
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: Bansal R.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. Pearson Press, 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
C01	1					1								
C02	3	2				1	1							
C03	1	3	2	1				1						
C04		1	2		1		1	2	1	1		1	1	1
C05		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)

Asses ment Metho d	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) / 2	15	6	Average of Two Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module - 3 & 4	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	

CIE								Scale down Marks of IAT and CCA to 25	
	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		CCA-1	CCA-2	
	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				
	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%
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	10	5	--	--	--	15	15%
CO2	5	10	5	--	5	25	25%
CO3	5	5	5	10	5	30	30%
CO4	--	--	5	5	5	15	15%
CO5			5	5	5	15	15%
Total	20	20	20	20	20	100	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 transmissibility	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	:	1 st / 2 nd			
Course Title	:	Principles of Programming Using C			
Course Code	:	BESCS101 / BESCS201			
Course Type (Theory/ Practical/ Integrated)	:	Integrated			
Category	:	ESC-1 / ESC-2			
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	:	3 Hours
Credits	:	03	Duration		

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

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COURSE CURRICULUM

Module No.	Topics	Hours
1	Introduction to C: Fundamentals of computing, flowcharts, pseudocodes, algorithm, data types, variables, constants, preprocessors, 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
Pedagogy	Peer Group Learning provides an opportunity for the students to learn from one-another.	
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
Pedagogy	Mind Mapping encourages innovative thinking to solve problems.	
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
Pedagogy	Think Pair and Share provides an opportunity for the students to learn from one-another.	
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
Pedagogy	Brain Storming encourages cognitive thinking and enables creative problem solving.	
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
Pedagogy	Demonstration exhibits the implementation process.	



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

Module No.	Topics	Hours
1	Introduction to C: Fundamentals of computing, flowcharts, pseudocodes, algorithm, data types, variables, constants, preprocessors, 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
Pedagogy	Peer Group Learning provides an opportunity for the students to learn from one-another.	
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
Pedagogy	Mind Mapping encourages innovative thinking to solve problems.	
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
Pedagogy	Think Pair and Share provides an opportunity for the students to learn from one-another.	
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
Pedagogy	Brain Storming encourages cognitive thinking and enables creative problem solving.	
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
Pedagogy	Demonstration exhibits the implementation process.	

List of Experiments or Programs

Sl.No	Experiments/Programs	COs
1	Write a C program to implement a Simple Calculator.	CO1
2	Compute the roots of a quadratic equation by accepting the coefficients. Print appropriate messages.	CO1
3	Write a C program for the following condition, 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
4	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
5	Implement Matrix multiplication and validate the rules of multiplication using C Program.	CO2
6	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	CO3
7	Write functions to implement string operations such as compare, concatenate, and find string length. Use the parameter passing techniques.	CO3
8	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.	CO3
9	Write a C Program to Implement linear search and binary search.	CO4
10	Write a C Program to Implement Bubble Sort.	CO4
11	Write a C program to read employee information (Name, Designation, Salary) from the user and write it to a file.	CO4
Open ended Programs		
1	Demonstrate the use of an array of pointers.	CO3
2	Develop a 'C' program to calculate the gravitational pull between two objects.	CO3
3	Demonstrate a simple units convertor for distance, temperature, and liquid volume.	CO3
4	Calculate the displacement for an automobile.	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.

Reference 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, 2017.
2	C: How to program, H. M. Deitel, P. J. Deitel, 7th edition, Pearson Education, 2010.
3	Programming in ANSI C, E.Balaguruswamy, 7th Edition, Tata McGraw-Hill,2019.
4	C Programming for Dummies, Dan Hookin, 2 nd Edition, John Wiley & Sons, 2021.
5	C, The Complete Reference is a book on computer programming, Herbert Schildt, McGraw Hill Education , 4th Edition, 2017.

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

CO	Course Outcomes	RBT Level	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

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	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CO3	--	3	--	--	--	--	--	--	--	--	--	--	--	--	--
CO4	--	--	3	--	--	--	--	--	--	--	--	--	--	--	--
CO5	--	--	--	3	--	--	--	--	3	--	--	3	--	--	--

List of AI Tools to be Used (Not limited to)

Claude Code, Workik : AI- Coding and execution platform. C Code generating tool for any given problem statement

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

Assessment Pattern (both CIE and SEE)

4 Credit Course – IPCC

Assessment Method	Component	Type of Assessment	Assessment Type used	Max. Marks	Evaluation Details	Reduced Marks	Min. Marks	Total	
CIE	Theory	AAT	Pedagogical Initiatives	10	Continuous Comprehensive Assessment (CCA) – Following assessment can be used Assignments/ quizzes/ seminars/ Certification/Pedagogical Initiatives	10	4	10	
		Test-1	Theory	25	Average of two Internal Assessment Tests each of 25 Marks, scale down the Marks to 15 Marks	15	6	15	
		Test-2	Theory	25					
	Total CIE Theory							10	25
	Lab	Conduction of Experiments	Performance with Record & Observation Book	15	Conduction of Experiments and Preparation of Laboratory Records	15	6	25	
		CIE Practical test	Evaluation & Viva-Voce	50	One test after conduction of all Experiments	10	4		
	Total CIE Practical							10	25
CIE (Theory + Practical)							20	50	
SEE				100	SEE Exam is Theory Exam, conducted for 100 Marks, scored marks are scaled down to 50 marks	50	18	50	
CIE+SEE							40	100	
	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.								

3 & 2 Credit Course								
Assessment Method	Component	Type of Assessment	Assessment Type used	Max. Marks	Evaluation Details	Reduced Marks	Min. Marks	Total
CIE	Theory	AAT	Pedagogical Initiatives	10	Continuous Comprehensive Assessment (CCA) – Following assessment can be used Assignments/ quizzes/ seminars/ Certification/Pedagogical Initiatives	10	4	10
		Test-1	Theory	25	Average of two Internal Assessment Tests each of 25 Marks, scale down the Marks to 15 Marks	15	6	15
		Test-2	Theory	25				
	Total CIE Theory						10	25
	Practical	Conduction of Experiments	Performance with Record & Observation Book	15	Conduction of Experiments and Preparation of Laboratory Records	15	6	15
		CIE Practical test	Evaluation & Viva-Voce	50	One test after conduction of all Experiments	10	4	10
	Total CIE Practical						10	25
Total CIE (CIE Theory + CIE Practical)						20	50	
SEE				100	SEE Exam is Theory Exam, conducted for 100 Marks, scored marks are scaled down to 50 marks	50	18	50
CIE+SEE							40	100
Note: This course refers to professional theory core course integrated with practical of the same course and credit for this course is 3.								

Note: This course refers to professional theory core course integrated with practical of the same course and credit for this course is 3.

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Theory			Practical
	Continuous Assessment Tests		Alternative Assessment Tool (AAT)	Test
	Test-1	Test-2		
	25 Marks	25 Marks		
Remember	5	--	--	--
Understand	10	5	--	--
Apply	10	10	10	5
Analyse	--	10	--	--
Evaluate	--	--	--	--
Create	--	--	--	20

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1			Test-2			
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	10	10	--	--	--	20	20%
CO2	10	10	10	--	--	30	30%
CO3	--	--	10	20	--	30	30%
CO4	--	--	--	--	20	20	20%
CO5	5	5	5	5	5	25	25% (Lab)
Total	20	20	20	20	20	100	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	:	1 st / 2 nd			
Course Title	:	COMPUTER AIDED ENGINEERING DRAWING			
Course Code	:	BESCM102 / BESCM202			
Course Type (Theory/ Practical/ Integrated)	:	Theory			
Course Category	:	ESC-1 / ESC-2			
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: Introduction, Definitions – projections of plane surfaces–triangle, square, rectangle, square, pentagon, hexagon and circle, planes in different positions by change of position method using first angle of projection 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, 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, 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	Illustrate the concepts of Orthographic Projections of points, Straight lines and Planes using drafting tool	A	L3
CO2	Exercise the Orthographic Projections of various solids employing drafting software	A	L3
CO3	Implement the Isometric Projections of solids, development of lateral surfaces of solids by utilising software application	A	L3
CO4	Practice the Orthographic projections of planes, solids by means of manual sketching	A	L3
CO5	Handle the isometric projections of solids/ development of lateral surfaces through manual sketching	A	L3

Mapping of Course Outcomes to Program Outcomes:

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

Weblinks and Video Lectures (e-Resources)

1	https://nptel.ac.in/courses/112104031
2	https://www.mooc-list.com/tags/engineering-drawing
3	https://www.mygreatlearning.com/academy/learn-for-free/courses/engineering-graphics-drawing

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) / 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 – 3,4 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 – 100%)

The average score of two 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
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CIE- Continuous Internal Evaluation (50 Marks)

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

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	100
Analyse	--
Evaluate	--
Create	--
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)

Semester	:	1 st		
Course Title	:	Communicative English		
Course Code	:	BCENC106		
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.



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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	
	Basic English Communicative Grammar and Vocabulary PART - II:	

4	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_KhhZvZI/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	:	1 st ಸೆಮಿಸ್ಟರ್				
Course Title	:	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ				
Course Code	:	BSBKC107 / 207				
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	ಪ್ರತಿಪರ ಪದವಿವಿಧ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡಭಾಷೆಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡಸಂಸ್ಕೃತಿಯ ಪರಿಚಯಮಾಡಿಕೊಡುವುದು.
2	ಕನ್ನಡಸಾಹಿತ್ಯದ ಪ್ರಧಾನಭಾಗವಾದ ಆಧುನಿಕಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸುವುದು.
3	ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
4	ತಾಂತ್ರಿಕವ್ಯಕ್ತಿಗಳಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳು ಸಾಧಿಸಿದವಿಷಯಗಳನ್ನುಪರಿಚಯಿಸುವುದು.
5	ಸಾಂಸ್ಕೃತಿಕಜನಪದ ಹಾಗೂ ಪ್ರವಾಸಕಥನಗಳ ಪರಿಚಯಮಾಡಿಕೊಡುವುದು.

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 devise 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 - ಹಂಪನಾಗರಾಜಯ್ಯ 2) ಕರ್ನಾಟಕ ಐಕ್ಯೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ - ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯ 3) ಆಡಳಿತಭಾಷೆಯಾಗಿ ಕನ್ನಡ-ಡಾ. ಎಲ್.ತಿಮ್ಮೇಶಮತ್ತು ಪ್ರೊಫೆಸರ್ ವಿಕೇಶವರ್ಮೂರ್ತಿ	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತಪುಸ್ತಕ ಆಧರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿಕಾವ್ಯ ಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಭೋಧನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	
2	1) ವಚನಗಳು : ಬಸವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ಕೆಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ, ಆಯ್ಕೆಲಕ್ಕಮ್ಮ. 2) ಕೀರ್ತನೆಗಳು : ಅದರಿದೇನುಫಲಇದರಿದೇನುಫಲ - ಪುರಂದರದಾಸರು, ತಲ್ಲಣಿಸದಿರುಕಂಡ್ಯತಾಳುಮನವೇ - ಕನಕದಾಸರು. 3) ತತ್ವಪದಗಳು - ಸಾವಿರಕೊಡಗಳಸುಟ್ಟು - ಶಿಶುನಾಳಶರೀಫ.	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತಪುಸ್ತಕ ಆಧರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿಕಾವ್ಯ ಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಭೋಧನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	
3	1) ಡಿ.ವಿ.ಜಿಯವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಆಯ್ದ ಕೆಲವು ಭಾಗಗಳು. 2) ಕುರುಡುಕಾಂಚಾಣ - ದಾ.ರಾ.ಬೇಂದ್ರೆ. 3) ಹೊಸಬಾಳಿನ ಗೀತೆ - ಕುವೆಂಪು.	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತಪುಸ್ತಕ ಆಧರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿಕಾವ್ಯ ಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಭೋಧನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	

4	1) ಡಾ. ಸರ್.ಎಮ್.ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ - ಎ.ಎನ್. ಮೂರ್ತಿರಾವ್. 2) ಕರಕುಶಲಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ - ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ.	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತಪುಸ್ತಕಆಧರಿಸಿ ಬ್ಲಾಕ್‌ಬೋರ್ಡ್‌ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿಕಾವ್ಯಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನಮಾದರಿಯ ಸಾಹಿತ್ಯಭೋದನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	
5	1) ಯುಗಾದಿ - ವಸುಧೇಂದ್ರ. 2) ಮೆಗಾನೆಂಬಗಿರಿಜನಪರ್ವತ - ಡಾ. ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ	
Pedagogy	1) ಸಾಂಸ್ಕೃತಿಕಕನ್ನಡವನ್ನು ಭೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತಪುಸ್ತಕಆಧರಿಸಿ ಬ್ಲಾಕ್‌ಬೋರ್ಡ್‌ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್‌ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಗಳಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶಮಾಡಿಕೊಡುವುದು. 2) ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಅಂದರೆ ಕವಿಕಾವ್ಯಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿಚಿತ್ರಣಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಗಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು. 3) ನವೀನಮಾದರಿಯ ಸಾಹಿತ್ಯಭೋದನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.	

Reference Books

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)
1. <i>Introduction to the History of Mathematics</i> by E. T. Whittaker, Cambridge University Press, 1927, 2nd Edition, 1954.
2. <i>The Principles of Mathematics</i> by G. H. Hardy, Cambridge University Press, 1903, 2nd Edition, 1933.
3. <i>Mathematics and its History</i> by J. J. O'Connor and E. F. Robertson, Cambridge University Press, 1993, 1st Edition, 1993.
4. <i>The History of Mathematics</i> by D. M. Burton, Academic Press, 1988, 1st Edition, 1988.
5. <i>Mathematics: A Concise History</i> by J. J. O'Connor and E. F. Robertson, Cambridge University Press, 1993, 1st Edition, 1993.
6. <i>The History of Mathematics</i> by D. M. Burton, Academic Press, 1988, 1st Edition, 1988.
7. <i>Mathematics: A Concise History</i> by J. J. O'Connor and E. F. Robertson, Cambridge University Press, 1993, 1st Edition, 1993.
8. <i>The History of Mathematics</i> by D. M. Burton, Academic Press, 1988, 1st Edition, 1988.
9. <i>Mathematics: A Concise History</i> by J. J. O'Connor and E. F. Robertson, Cambridge University Press, 1993, 1st Edition, 1993.
10. <i>The History of Mathematics</i> by D. M. Burton, Academic Press, 1988, 1st Edition, 1988.

1	ಸಾಂಸ್ಕೃತಿಕಕನ್ನಡ- ಡಾ.ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯಮತ್ತುಡಾ. ಎಲ್.ತಿಮ್ಮೇಶ್
2	ಶ್ರೀಆರ್‌ಮಂಜುನಾಥ್‌ಹಾಗೂಪಿ. ನಾಗರಾಜ
3	ಡಾ. ಪ್ರಾಶಾಂತ್‌ಜಿನಾಯಕಮತ್ತುಶ್ರೀಟಿ.ಎಲ್.ರವೀಂದ್ರ

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

CO	Course Outcomes	RBT Level	Level Indicator
C01	ಕನ್ನಡಭಾಷೆ ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯುಕುರಿತು ಅರಿವುಮೂಡಿರುತ್ತದೆ.	ಸ್ಮರಿಸುವುದು	L-2
C02	ಕನ್ನಡಸಾಹಿತ್ಯದ ಪ್ರಧಾನಭಾಗವಾದ ಆಧುನಿಕಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಕಲಿತು ಹೆಚ್ಚಿನ ಓದಿಗೆ ಮತ್ತು ಜ್ಞಾನಕ್ಕೆ ಸ್ಪೂರ್ತಿ ಮೂಡುತ್ತದೆ.	ಅರ್ಥೈಸಿಕೊಳ್ಳುವುದು	L-2
C03	ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಹೆಚ್ಚಾಗುತ್ತದೆ.	ಸ್ಮರಿಸುವುದು	L-1
C04	ತಾಂತ್ರಿಕವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ ಹಾಗೂ ಅವರುಗಳು ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಂಡು ನಾಡಿನ ಇನ್ನಿತರ ವ್ಯಕ್ತಿಗಳಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳಲು ಕೌತುಕತೆಹೆಚ್ಚಾಗುತ್ತದೆ.	ಅರ್ಥೈಸಿಕೊಳ್ಳುವುದು	L-1
C05	ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸಕಥನಗಳ ಪರಿಚಯಮಾಡಿಕೊಡುವುದು.	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
C01	--	--	--	--	--	--	--	--	1	2	--	2	--	--
C02	--	--	--	--	--	--	--	--	2	2	--	2	--	--
C03	--	--	--	--	--	--	--	--	2	1	--	1	--	--
C04	--	--	--	--	--	--	--	--	2	1	--	1	--	--
C05	--	--	--	--	--	--	--	--	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

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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	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	-	-

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	9	9	50	100%

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	ಕರ್ನಾಟಕಸಂಸ್ಕೃತಿ - ಹಂಪನಾಗರಾಜಯ್ಯ	1
2	ಕರ್ನಾಟಕಏಕೀಕರಣ : ಒಂದುಅಪೂರ್ವಚರಿತ್ರೆ - ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯ	1
3	ಆಡಳಿತಭಾಷೆಯಾಗಿ ಕನ್ನಡ - ಡಾ. ಎಲ್.ತಿಮ್ಮೇಶಮತ್ತುಪ್ರೊಫಸರ್.ವಿಕೇಶವಮೂರ್ತಿ	1
4	ವಚನಗಳು : ಬಸವಣ್ಣ , ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿಲಕ್ಕಮ್ಮ.	1
5	ಕೀರ್ತನೆಗಳು : ಅದರಂದೇನುಫಲಇದರಂದೇನುಫಲ - 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 - ಎಎನ್.ಮೂರ್ತಿರಾವ್.	1½
11	ಕರಕುಶಲಕಲೆಗಳುಮತ್ತುಪರಂಪರೆಯವಿಜ್ಞಾನ - ಕರೀಗೌಡಬೀಚನಹಳ್ಳಿ	1½
12	ಯುಗಾದಿ - ವಸುಧೇಂದ್ರ.	1½
13	ಮೆಗಾನೆಂಬರಿಗಿರಿಜನಪರ್ವತ - ಡಾ. ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ	1½
Total		15 Hrs



Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	1 st			
Course Title	:	Innovation And Design Thinking			
Course Code	:	BIDTC108			
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	:	01 Hour
Credits	:	01	Duration	:	

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 devise 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 Hallgrímsson, 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=Ee4CKIPkIik&list=PLo2Y_6-IlgFXbyOjTcTg_IJQ0fZghjjQw&index=3
2	Design thinking, 3 major stages HBR https://www.youtube.com/watch?v=z3lbHLfcyWo&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	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

2nd Semester



Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	II				
Course Title	:	Engineering Mathematics – II for ME Stream				
Course Code	:	BMATM201				
Course Type (Theory/ Practical/ Integrated)	:	Theory				
Course Category	:	ASC				
Stream	:	ME		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 Differential equations and Laplace Transforms in solving problems
3	Analyze problems using concepts of Differential equations and Laplace Transforms
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 2025-26)

COURSE SYLLABUS

Module No.	Contents of the Module	Hours
1	Ordinary Differential Equations of first order: Linear differential equation, exact differential equation, reducible to exact differential equation, Newton's law of cooling, LR circuits.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
2	Ordinary Differential Equations of second and higher order: Second and higher order differential equations, inverse differential operator, Cauchy's differential equations, method of variation of parameters, LCR circuits, Vibration problems.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
3	Numerical solution of Ordinary Differential Equations: Taylor's series method, Runge-Kutta method of fourth order, Milne's predictor and corrector method, Milne's predictor and corrector method for second order ODE.	10
Pedagogy	Chalk and board, group discussion, ppt, videos	
4	Partial differential equations: Formation of partial differential equation by eliminating arbitrary constants, solution of PDE by direct method, 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	
5	Laplace transform and Inverse Laplace transform: Definition, transforms of elementary functions, properties of Laplace transform- Laplace transform of $e^{at} f(t)$, $t f(t)$, $f(t)/t$, inverse Laplace transform using partial fractions, 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	Differential Equations, Richard Bronson, Gabriel B Costa, Schaum's outline series, McGraw Hill Publications, 3 rd Edition
2	Numerical Methods, M. K. Jain, S. R. K. Iyengar, R. K. Jain, New Age Publications, 6 th Edition
3	Higher Engineering Mathematics, B. S. Grewal, Khanna Publications, 44 th Edition, 2022.

Reference Books

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1	Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Publications, 10 th Edition
2	Advanced mathematics for Engineers and Scientists, Murray R Spiegel, Schaum's outline series, McGraw Hill publications.
3	Higher Engineering Mathematics, H. K. Dass and Er. Rajnish Verma, S. Chand Publication, 3 rd 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 basic concepts of differential equations and Laplace transforms	Understand	L2
CO2	Apply techniques of differential equations and Laplace transforms to solve engineering problems	Apply	L3
CO3	Analyze engineering problems using differential equations and Laplace transforms	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
C01														
C02	3													
C03		1												
C04			2		2				1	1				

Weblinks and Video Lectures (e-Resources)

1	https://archive.nptel.ac.in/courses/111/106/111106100/
2	https://nptel.ac.in/courses/111106101
3	https://archive.nptel.ac.in/courses/111/106/111106139/

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	
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	Linear differential equations of first order and first degree	1
1	Problems continued on the above	1
1	Exact equations	1
1	Problems continued on the above	1
1	Equations reducible to exact	1
1	Problems continued on the above	1
1	Newton's law of cooling and problems	1
1	Problems continued on the above	1
1	LR Circuits	1
1	Problems continued on the above	1
2	Second and higher order differential equations	1
2	Homogeneous differential equations	1
2	Problems continued on the above	1
2	Inverse differential operator, three types	1

2	Problems continued on type-I	1
2	Problems continued on type-II	1
2	Problems continued on type-III	1
2	Cauchy's differential equation and problems	1
2	LCR Circuit	1
2	Vibration problems	1
3	Numerical solution of ODE by Taylor's series method	1
3	Problems continued on the above	1
3	Problems continued on the above	1
3	Runge-Kutta method of fourth order	1
3	Problems continued on the above	1
3	Problems continued on the above	1
3	Milne's predictor and corrector method	1
3	Problems continued on the above	1
3	Milne's predictor and corrector method of second order	1
3	Problems continued on the above	1
4	Method of elimination of arbitrary constants	1
4	Solution of PDE by direct integration	1
4	Problems continued on the above	1
4	Solution of one-dimensional heat equation	1
4	Solution of one-dimensional wave equation	1
4	Numerical solution of Laplace equation	1
4	Numerical solution of heat equation	1
4	Problems continued on the above	1
4	Numerical solution of wave equation	1
4	Problems continued on the above	1
5	Introduction and definition of Laplace transform	1
5	Laplace transform of some standard functions	1
5	Basic properties of Laplace transforms	1
5	Problems on the above	1
5	Inverse Laplace transforms	1
5	Inverse Laplace Transforms by Partial fractions	1
5	Problems on the above	1
5	Problems continued on the above	1
5	Solution of LDE using Laplace transform	1
5	Problems on the above	1
		50 hrs



Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	1 st /2 nd			
Course Title	:	Applied Physics for Mechanical Engineering Stream			
Course Code	:	BPHYM102 / BPHYM202			
Course Type (Theory/ Practical/ Integrated)	:	Integrated			
Category	:	ASC			
Stream	:	Common to Civil and Mech 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

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	Oscillations and Shock waves: Oscillations: Simple Harmonic motion (SHM), Differential equation for SHM (No derivation), Springs: Stiffness Factor and its Physical Significance, Series and Parallel combination of springs (Derivation), Theory of Damped oscillations (Derivation), Types of Damping (Graphical Approach). Engineering applications of Damped oscillations, Theory of Forced oscillations (Qualitative), Resonance, Sharpness of resonance. Numerical Problems. Shock waves: Mach number and Mach Angle, Definition and Characteristics of Shock waves, Construction and working of Reddy Shock tube, Applications of Shock Waves, Numerical problems. Pre-requisites: Basics of Oscillations Self-learning: Simple Harmonic motion, Differential equation for SHM	8
Pedagogy	Chalk and talk: Expression for damped Oscillations PPT: Resonance, Videos: Reddy shock tube Group Discussion Seminar	
2	Electrical Properties of Materials and Applications Electrical Conductivity in metals, Resistivity and Mobility, Concept of Phonon, Matheissen's rule, 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. Numerical Problems. Superconductivity Introduction to Super Conductors, Temperature dependence of resistivity, Meissner's Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative), Quantum Tunnelling, High Temperature superconductivity, Applications: Maglev vehicle, Numerical problems. Pre requisites: Basic electrical Properties Self-learning: Resistivity and Mobility	8
Pedagogy	Chalk and talk: Matheissen;s rule PPT: Classical free electron theory, Quantum free electron theory, Superconductivity Videos: Types of superconductors and quantum tunnelling Group Discussion Seminar	
3	Quantum Mechanics:	8

	de Broglie Hypothesis and Matter Waves, de Broglie wavelength and derivation of expression by analogy, Phase Velocity and Group Velocity, Heisenberg's Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic), Principle of Complementarity, Wave Function, 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, Quantization of Energy States, Pre requisites: Basics of Quantum mechanics Self-learning: wave - particle duality	
Pedagogy	Chalk and talk: One dimensional infinite potential well, Time independent Schrodinger wave equation PPT: de Broglie wavelength, Wave function Videos: : Quantization of energy states Group Discussion Seminar	
4	LASER and Optical Fiber LASER Einstein's coefficient, Expression for energy density, Population Inversion, Metastable State, Requisites of a LASER System, Types of laser, CO₂ LASER, Applications: LIDAR, Bridge Deflection, Measurement of pollutants in the environment, Numerical Problems. Optical Fiber Propagation of light in optical fiber, Acceptance angle and Numerical Aperture (NA), Expression for NA, Modes of Propagation, types of fiber, Attenuation and Fiber Losses, Fiber Optic Displacement Sensor, Measurement of pollutants, Numerical Problems Pre requisite: Properties of light Self-learning: Total Internal Reflection, Properties of a LASER Beam, Principle and Construction of Optical Fibers,	8
Pedagogy	Chalk and talk: Expression for Energy Density (Derivation), Expression for NA PPT: Semiconductor Diode Laser Videos: Applications of Lasers and Optical Fibers Group Discussion Seminar	
5	Material Characterization and Instrumentation Techniques: Introduction to Nanomaterial and nanocomposites. Materials Characterization: X-ray Diffractometer (XRD), Crystallite size determination by Scherrer equation, Atomic Force Microscopy (AFM), X-ray photoelectron spectroscopy(XPS), Scanning electron microscopy (SEM), Transmission electron microscopy (TEM), Numerical Problems. Pre requisites: Fundamentals of Crystal Self-learning: Crystal structures	8
Pedagogy	Chalk and talk: Nanomaterial and nanocomposites PPT: All Materials characterization Videos: All Materials characterization Group Discussion Seminar	

List of Experiments or Programs

Sl.No	Experiments/Programs	COs
1	Determination of Magnetic Flux Density at any point along the axis of a circular coil	6
2	Determination of Rigidity modulus of the Material of the wire using Torsional Pendulum.	6
3	Study of Forced Mechanical Oscillations and Resonance.	6
4	Study of the frequency response of Series & Parallel LCR circuits.	6
5	Determination of Fermi Energy of the given Conductor.	6
6	Determination of effective spring constant of the given springs in series and parallel combinations.	6
7	Determination of dielectric constant of the material of capacitor by Charging and Discharging method.	6
8	Study the Characteristics of a Photo-Diode and to determine the power responsivity / Verification of Inverse Square Law of Intensity of Light.	6
9	Determination of Wavelength of Laser using Diffraction Grating	6
10	Determination of Acceptance angle and Numerical Aperture of the given Optical Fiber.	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	Vibrations and Waves (MIT introductory Physics Series), A P French, CBS, 2003 Edition .
2	Shock waves made simple by Chintoo S Kumar, K Takayama and K P J Reddy: Willey India Pvt. Ltd, Delhi, 2014
3	Heat and Thermodynamics, Brijlal & Subramanyam, S. Chand & Company Ltd., New-Delhi.
4	Materials Characterization Techniques-Sam Zhang, Lin Li, Ashok Kumar, CRC Press, First Edition, 2008.
5	Lasers and Non Linear Optics – B.B. Laud, 3rd Ed, New Age International Publishers 2011

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
C01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C02	3	--	--	--	--	--	--	--	--	--	--	--	--	--
C03	--	2	--	--	--	--	--	--	--	--	--	--	--	--
C04	--	--	2		2	--	--	--	--	--	--	--	--	--
C05	--	--	--	--	--	--	--	--	2	2	--	1	--	--
C06	--	--	--	--	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	Physics: http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
4	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

Assess ment 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) / 2	15	6	Average of Two Internal test each of 50 Marks scale down
		Internal Assessment Test (IAT) - II	Module – 3,4 & 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

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

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 90 – 100%)

The average score of two 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		CCA-1	CCA-2	
	50 Marks	50 Marks		50 Marks	50 Marks	
Remember	10	10				
Understand	24	24				10
Apply	8	8				
Analyse	8	8				5
Evaluate				50	50	35
Create						

CIE Course Assessment Plan

CO's		Marks Distribution					Total Marks	Weightage
	Test-1		Test-2					
	Module-1	Module-2	Module-3	Module-4	Module-5			
CO1	32	32	20	16	22		122	61
CO2	10	10	10	10	10		50	25
CO3	8	8	4	4	4		28	14
CO4								
CO5								
CO6								
Total	50	50	34	30	36		200	100

SEE- Semester End Examination (50 Marks)

Bloom's Category	SEE Marks (90% Theory+10% Practical Questions)
Remember	10
Understand	50
Apply	20
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	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	Simple Harmonic motion - Only definition, examples, mention of differential equation, mention of natural frequency and time period expression	1
1	Hooke's law, Stiffness Factor and its Physical Significance, series and parallel combination of springs (Derivation), (Only Compression springs and their use in shock absorber and suspensions, leaf spring and its use in railway/truck suspension)	1
1	Definition, Various forces acting on the system, Set up of the Differential equation, Assuming the expression for displacement explanation for variation of amplitude, Mention of three different cases and Graphical Explanation	1
1	Qualitative discussion of applications such as automatic door closures, automobile suspension system, Definition of forced oscillation, Various forces acting on the system, Set up of the Differential equation, Assuming the expression for Amplitude and Phase, Explanation of variation of amplitude with frequency (Three Cases)	1
1	Qualitative explanation of resonance and sharpness of resonance (without derivation), Definition of Mach number, Mach Angle, Mach Regimes, characteristics of Shock waves	2
1	Construction and working of Reddy shock tube, Mention of applications such as aerodynamics study, chemical kinetic study etc	1
1	Numerical problems on SHM, Springs: Stiffness Factor, series and parallel combination of springs, damped oscillations, forced oscillations, Resonance and Mach number	1
2	Assumptions of Quantum Free Electron Theory of Metals, Fermi-energy, Fermi factor, Variation of Fermi Factor with Temperature and Energy. Mention of expression for electrical conductivity	1
2	Fundamentals of dielectrics. Polar and non-polar dielectrics, Polarization, Mention of relation between dielectric constant and polarization. Electrical polarization Mechanisms (Electronic, Ionic, Orientation and Space charge).	1
2	Definition of internal field in case of solids and mention of its expression for one dimensional case. Mention of expressions for internal field for three dimensional cases and Lorentz field. Derivation of Clausius-Mossotti equation.	1
2	Description of solid, liquid and gaseous dielectrics with one example each. Qualitative explanation of applications of dielectrics in transformers, Capacitors, Electrical Insulation.	1
2	General Introduction about Superconductivity, Graphical approach of Temperature dependence of resistivity in metals, Mathiessen's rule [$\rho = \rho_0 + \rho(T)$],	1

2	Temperature dependence of resistivity in superconductors, Definition of superconductivity & Critical temperature. Meissner's Effect, Critical field, Temperature dependence of Critical field,	1
2	Detailed explanation of Type I & Type-II Superconductors. BCS Theory: Phonon & Phonon field, Cooper pairs, High Temperature Superconductors(qualitative). Brief explanation of SQUID & mention its applications,	1
2	Numerical Problems : Fermi factor, Electrical Conductivity, Polarization, Clausius-Mossotti relation, Variation critical field with temperature	1
3	Statement of de-Broglie Hypothesis, Derivation of expression for de Broglie wavelength (λ) by analogy and different forms of expression for (λ)	1
3	Heisenberg's Uncertainty Principle, Non existence of electron inside the nucleus (Non-relativistic),	1
3	Principle of Complementarity, Correlation between de Broglie Wavelength, Heisenberg's Uncertainty principle and wave packet, Wave Function, Explanation, General Mathematical Form (Exponential),	1
3	Physical Significance of a wave function (Probability Density) and Born Interpretation, Expectation value, Eigen functions and Eigen Values,	1
3	Schrödinger Time Independent wave definition, Setting up of Time independent Schrodinger wave equation in 1D (derivation) and extension to 3D (mention)	1
3	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	1
3	Numerical Problems on de Broglie Hypothesis, Heisenberg's Uncertainty Principle, Energy Eigen Values for a particle in 1D infinite potential well	1
4	Characteristics of LASER, Interaction of radiation with matter (induced absorption, spontaneous and stimulated emission in terms of Einstein Coefficients), Derivation of expression for energy density equation and its significance	1
4	Requisites of a Laser system (Excitation source, Active media and laser cavity) and pumping, Conditions for laser action(population inversion & meta stable state)	1
4	Principle, Construction and working of CO ₂ Laser with energy level diagram, Application of Lasers in LIDAR and Bridge Deflection	2
4	Propagation mechanism, Angle of Acceptance, Numerical Aperture (NA), derivation of expression for NA, Fractional Index Change(Δ), Relation between NA & Δ . Modes of propagation , mention of expression for number of modes and V number. Types of optical fibers.	1
4	Types of attenuation, Mention of Expression for Attenuation coefficient, and Attenuation spectrum of an optical fiber with communication windows. Mention of expression for attenuation coefficient,	1
4	Discussion of block diagram of point to point communication. Optical fiber sensors- Intensity based displacement sensor Merits and demerits of optical fibers.	1
4	Numerical Problems : Ratio of Population, Number of photons / sec in a LASER beam of certain power output, Numerical Aperture, Acceptance angle and Attenuation Co-efficient	1
5	Introduction to materials: Nanomaterials and Nano composites.	1
5	Principle, construction and working of X-ray Diffractometer, crystal size determination by Scherrer equation	1
5	Principle, construction, working and applications of Atomic Force Microscopy (AFM)	1
5	Principle, construction, working and applications of X-ray photoelectron spectroscopy (XPS)	1

5	Principle, construction, working and applications of Scanning electron microscopy (SEM),	1
5	Principle, construction, working and applications of Transmission electron microscopy (TEM),	1
5	Numericals on X-Ray diffraction and Scherrer equation	2
Total		40 Hrs



Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	1 st /2 nd			
Course Title	:	ELEMENTS OF MECHANICAL ENGINEERING			
Course Code	:	BCECM107/BCECM207			
Course Type (Theory/ Practical/ Integrated)	:	Theory			
Course Category	:	CEC – 1/CEC-2			
Stream	:	ME	CIE	:	50 Marks
Teaching hours/ week (L:T:P:S)	:	3:0:0:0	SEE	:	50 Marks
Total Hours	:	45 Hrs T	SEE Duration	:	3 Hours
Credits	:	03			

Course Learning Objectives: Students will be taught to

Sl.No	Course Objectives
1	Understand the scope of Energy Conversion Systems.
2	Gather knowledge on Manufacturing Technology.
3	Acquire a basic understanding of IC Engines, Power Transmission, Refrigeration and Air Conditioning
4	Accomplish the working principle of Metal Fabrication Processes
5	To provide insights on recent Advancements in Mechanical 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 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.



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
	Module 1: Energy Conversion Systems	
1	Introduction to Mechanical Engineering: Role of Mechanical Engineering in Industries and Society- Emerging Trends and Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors. Steam formation and Boilers: Introduction, formation of steam, Steam properties, types of steam and applications of steam, Introduction to Boiler, Classifications of Boilers – Fire Tube Boilers and Water Tube Boilers Turbines and Pumps: Introduction to Turbines and Pumps, Energy Conversion, Types of Pumps and Turbines, Working Principle and Operation of various Pumps and Turbines, Advantages, Applications	9
Pedagogy	Demonstration, PPT, Video Lectures	
	Module 2: Manufacturing Technology	
2	Metal Casting: Introduction to Metal casting Process, general steps of Metal Casting, advantages, and applications Machining Processes: Introduction to Machine tools such as Lathe Machine, Drilling Machine, shaping machine and Milling Machine, working principles and their operations Metal Forming Processes: Introduction, Cold working, Hot Working, Classification of Metal forming processes	9
Pedagogy	Hands on Sessions, Experimental Learning	
	Module 3: IC Engines, Power Transmission, Refrigeration and Air Conditioning	
3	IC Engines: Introduction, Working principles of IC Engines, Types of IC Engines, Application of IC Engines Power Transmission: Introduction, Overview of Power transmission devices such as Gear Drives, Belt Drives and Chain Drives, their advantages, and applications Refrigeration and Air Conditioning: Introduction, Working Principle of Refrigeration and Air Conditioning systems, applications of Refrigeration and Air Conditioning systems	9

Pedagogy	Demonstration, Video Lectures, Case Studies	
4	Module 4: Metal Fabrication Process Welding: Introduction to welding, principle of welding, types of Welding, Welding terminologies, types of welded joints, advantages, limitations, and applications Soldering: Introduction to Soldering, Principle of soldering, solder and flux, advantages, limitations, and applications Brazing: Introduction to Brazing, Principle of brazing, advantages, limitations, and applications Laser Welding: Introduction to Laser Welding, principle of Laser Generation, Laser Welding Mechanisms, advantages, limitations, and applications	9
Pedagogy	Demonstration, Hands on Sessions	
5	Module 5: Advancements in Mechanical Engineering Advanced Machining Technology: CNC Machines, Applications of CNC Machining, Laser Machining, applications of Laser Machining Additive Manufacturing: Introduction to Additive Manufacturing / 3D printing, advantages, and applications of 3D Printing. Mechatronics Systems: Introduction, components of mechatronics system, Classification of mechatronics systems, Advantages, and applications. Robotics Technology: Introduction to Automation in industries, overview of Robots, types of robots, advantages, and applications of robots in industries, Internet of Things (IoT) for Mechanical Engineering	9
Pedagogy	Hands on Sessions, Experimental Learning, Case Studies	

Reference Books	
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)	
1	Elements of Mechanical Engineering, Ashok Kumar M S, Vijaya G, LAP LAMBERT Academic Publishing, 2023
2	Elements of Mechanical Engineering, H.G. Patil, B.Y.Patil, Dream Tech Press, 2020
3	Manufacturing Technology- Foundry, Forming and Welding, P.N.Rao Tata McGraw Hill, Volumen 1, 5 th Editon Ed., 2018.

4	Workshop Technology Volume-1 Manufacturing Process, SK Hajra Choudhary, AK Hajra Choudhary, Nirjhar Roy, Media Promoters and Publishers Pvt. Ltd., 2018.
5	Elements of Mechanical Engineering, K R Gopala Krishna, Sudhir Gopalakrishna, Dr.Girish H.N, Subhash Publications, 2019.
6	Robotics, Appu Kuttan KK K. International Pvt Ltd, volume 1, 2007

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

CO	Course Outcomes	RBT Level	Level Indicator
CO1	Understand the Essential Concepts of Mechanical Engineering.	L 2	Understand
CO2	Apply the Ideas of Mechanical Engineering for Various Applications.	L 3	Apply
CO3	Analyze the Working Principles of Various Mechanical Engineering Systems.	L 4	Analyze
CO4	Evaluate the Performance Parameters of Various Mechanical Engineering Systems	L 5	Evaluate

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	-	-	-	-	-	3	-	-	-	-	-		
CO3	-	3	-	-	-	-	-	-	-	-	-	-		
CO4	-	-	-	2	-	-	-	-	-	-	-	-	2	2

Web links and Video Lectures (e-Resources)

1	https://onlinecourses.nptel.ac.in/noc22_me28/preview
2	https://archive.nptel.ac.in/courses/112/107/112107219/
3	https://nptel.ac.in/courses/112101098
4	https://onlinecourses.nptel.ac.in/noc21_me76/preview
5	https://www.tlv.com/global/TL/steam-theory/principal-applications-for-steam.html
6	https://www.forbesmarshall.com/Knowledge/SteamPedia/About_Steam/Fundamental-Applications-of-Steam
7	https://rakhoh.com/en/applications-and-advantages-of-steam-in-manufacturing-and-process-industry/
8	Videos Makino (For Machine Tool Operation)

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) / 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 – 3,4 & 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 100%)

The average score of two 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 50 Marks
	IAT-1	IAT-2		CCA-1	CCA-2	
	50 Marks	50 Marks		50 Marks	50 Marks	
Remember	-	-		-	-	-
Understand	10	10		-	-	-
Apply	20	20		-	-	-
Analyse	20	20		-	-	-
Evaluate	-	-		50	50	-

CIE Course Assessment Plan

CO's	Marks Distribution					Total Marks	Weightage
	Test-1		Test-2				
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	05	05	05	05	10	30	20
CO2	10	10	10	10	20	60	40
CO3	10	10	10	10	20	60	40
CO4	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-
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	30
Apply	35
Analyse	35
Evaluate	-

Develop	-
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SEE Course Plan

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module-3	Module-4	Module-5		
CO1	6	6	6	6	6	30	30
CO2	7	7	7	7	7	35	35
CO3	7	7	7	7	7	35	35
CO4	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-
Total	20	20	20	20	20	100	100

Course Contents and Lecture Schedule

Module No.	Topics	No. of Lectures
1	Module 1: Energy Conversion Systems - Introduction	1
1	Role of Mechanical Engineering in Industries and Society	1
1	Emerging Trends and Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors.	1
1	Steam formation and Boilers: Introduction	1
1	Introduction, formation of steam, Steam properties, types of steam and applications of steam	1
1	Introduction to Boiler, Classifications of Boilers – Fire Tube Boilers and Water Tube Boilers	1
1	Turbines and Pumps: Introduction	1
1	Energy Conversion, Types of Pumps and Turbines, Working Principle and Operation of various Pumps and Turbines, Advantages, Applications	1
1	Working Principle and Operation of various Pumps and Turbines, Advantages, Applications	1
2	Module 2: Manufacturing Technology - Introduction	1
2	Metal Casting: Introduction to Metal casting Process	1
2	Advantages, and applications	1
2	Machining Processes: Introduction to Lathe Machine, Drilling Machine, Operations	1
2	Introduction to Shaping machine and Milling Machine, Operations	1
2	Introduction to Drilling Machine, Operations	1
2	Metal Forming Processes: Introduction	1
2	Introduction to Cold working, Hot Working,	1
2	Classification of Metal forming processes	1
3	Module 3: IC Engines: Introduction	1
3	Working principles of IC Engines, Types of IC Engines, Application of IC Engines	1
3	Types of IC Engines, Application of IC Engines	1
3	Power Transmission: Introduction, Gear Drives, Applications	1
3	Introduction to Belt Drives and Chain Drives, Applications	1
3	Introduction to Chain Drives, Applications	1
3	Refrigeration and Air Conditioning: Introduction	1
3	Working Principle of Refrigeration systems, Applications	1
3	Working Principle of Conditioning systems, Applications	1
4	Module 4: Metal Fabrication Process: Introduction	1
4	Welding: Introduction to welding, principle of welding, types of Welding	1

4	Welding: Welding terminologies, types of welded joints, advantages, limitations, and applications	1
4	Soldering: Introduction to Soldering, Principle of soldering	1
4	Soldering: Solder and flux, advantages, limitations, and applications	1
4	Brazing: Introduction to Brazing, Principle of brazing	1
4	Brazing: Advantages, limitations, and applications	1
4	Laser Welding: Introduction to Laser Welding, principle of Laser Generation	1
4	Laser Welding: Laser Welding Mechanisms, advantages, limitations, and applications	1
5	Module 5: Advancements in Mechanical Engineering: Introduction	1
5	Advanced Machining Technology: CNC Machines, Applications of CNC Machining,	1
5	Advanced Machining Technology: Laser Machining, applications of Laser Machining	1
5	Additive Manufacturing: Introduction to Additive Manufacturing / 3D printing	1
5	Additive Manufacturing: Advantages, and applications of 3D Printing.	1
5	Mechatronics Systems: Introduction, components of mechatronics system	1
5	Mechatronics Systems: Classification of mechatronics systems, Advantages, and applications.	1
5	Robotics Technology: Introduction to Automation in industries, overview of Robots, types of robots, advantages, and applications of robots in industries	1
5	Robotics Technology: Internet of Things (IoT) for Mechanical Engineering	1
Total		45 Hrs



Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	I/II				
Course Title	:	Introduction to AI and Applications				
Course Code	:	BETCS103/203				
Course Type (Theory/ Practical/ Integrated)	:	Theory				
Category	:	ETC				
Stream	:	CSE		CIE	:	50 Marks
Teaching hours/week (L: T:P:S)	:	3:0:0:0		SEE	:	50 Marks
Total Hours	:	40		SEE Duration	:	3 Hours
Credits	:	3				

Course Learning Objectives: Students will be able to:

Sl. No	Course Objectives
1	To provide fundamental knowledge of Artificial Intelligence, Generative AI, Machine Learning, Knowledge Representation, and Prompt Engineering concepts.
2	To enable students to apply AI, Gen AI and Machine Learning techniques and prompt engineering methods for solving real-world problems.
3	To develop analytical skills for evaluating different AI algorithms, models, and their performance across various applications.
4	To create awareness about current trends, ethical issues, and the impact of AI technologies in different domains.

Teaching-Learning Process

Pedagogical Initiatives:

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

- Adopt different teaching methods to attain the course outcomes.
- Include videos to demonstrate various concepts in C.
- Encourage collaborative (Group) Learning to encourage team building.
- Ask at least three **HOTS (Higher-order Thinking Skills)** module-wise questions to promote critical thinking.
- 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.
- Show different ways to solve a problem & encourage the students to come up with creative & optimal-solutions
- Discuss various case studies to map with real-world scenarios and improve the understanding.
- Devise innovative pedagogy to improve **Teaching-Learning Process (TLP)**.



DSATM

Scheme of Teaching and Examinations for BE Program -2024-25
Outcome Based Education and Choice Based Credit System (CBCS)
(Effective from the Academic Year 2024-25)

COURSE CURRICULUM

Modul No.	Topics	Hours
1	Introduction to Artificial Intelligence: Artificial Intelligence, How Does AI Work?, Advantages and Disadvantages of Artificial Intelligence, History of Artificial Intelligence, Types of Artificial Intelligence, Weak AI, Strong AI, Reactive Machines, Limited Memory, Theory of Mind, Self-Awareness, Is Artificial Intelligence Same as Augmented Intelligence and Cognitive Computing, Machine Learning and Deep Learning. Artificially Intelligent Machine: Defining Intelligence, Components of Intelligence, Differences Between Human and Machine Intelligence, Agent and Environment Textbook 1: Chapter 1 (1.1-1.5), Chapter 3 (3.1-3.4)	08
Pedagogy	Video Demonstration and Visualization.	
2	AI: What It Is and How It Works: What is Generative AI and what it isn't? Predictive AI vs Generative AI: What's the difference? How does Generative AI work? How to use today's AI generators? How to use generative AI in your daily life?: AI in art, AI in business, AI in Finance and Banking, AI in Gaming, AI in Healthcare, AI in writing, AI in Learning, AI in Marketing and Advertisement, AI in Music, AI in Programming and software development, AI in transportation and development, AI everywhere Benefits and Risks of AI: Understanding the potential benefits of AI, Understanding the potential risks of AI, How to spot AI in the wild, Debating the ethics of AI-created content, AI and copyright law Textbook 2: Chapter 1(only the topics mentioned), Chapter 2	08
Pedagogy	Case Study and Interactive Discussion	
3	Getting Started with All-Purpose AI Tools: What is an all-purpose AI tool—and what can you do with it? How to use a generative AI tool? Getting to know publicly available AI tools: ChatGPT, Google Gemini, Claude, Meta AI, Microsoft Copilot, Perplexity, Pi, Poe, Using the most popular AI generators, Which generative AI tool is the best for you? How to construct a great prompt? Using AI-generated results—with caution. Textbook 2: Chapter 3 Knowledge Representation: Knowledge Representation: Introduction, Knowledge Representation, Knowledge-Based Agent, Types of Knowledge, Techniques of Knowledge Representation in AI Textbook 1: Chapter 4 (4.1 – 4.5)	08

Pedagogy	Presentation	
4	Machine Learning: Techniques in AI, Machine Learning Model, Regression Analysis in Machine Learning, Classification Techniques, Clustering Techniques, Naïve Bayes Classification, Neural Network, Support Vector Machine (SVM). Textbook 1: Chapter 2 (2.1-2.8)	08
Pedagogy	Poster Presentation	
5	Computer Vision (CV): Human Vision vs Computer Vision, How Does Computer Vision Work, The Evolution of Computer Vision, Tasks in Computer Vision, How Computer Vision Works with AI, Applications of Computer Vision, Which Vision Succeeded? Challenges in Computer Vision, Understanding Image Pixels Where AI Is Heading Today?: Expert System AI Evolving with New Age Techniques: Fuzzy Logic Textbook 1: Chapter 6 (6.1- 6.9), Chapter 9 (9.1), Chapter 10 (10.1)	08
Pedagogy	Video demonstration and Simulation	
	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	

Textbooks	
Sl. No.	Title of the Book/Name of the author/Name of the publisher/Edition and Year
1	Reema Thareja, Artificial Intelligence: Beyond Classical AI, Pearson Education, 2023.
2	Michael Miller, Using Artificial Intelligence – Absolute Beginners Guide, Pearson 2025
Reference Books	
1	Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach (4th Edition), Pearson Education, 2023.
2	Elaine Rich, Kevin Knight, and Shivashankar B. Nair, Artificial Intelligence, McGraw Hill Education.
3	Tom Taulli, Prompt Engineering for Generative AI: ChatGPT, LLMs, and Beyond, Apress, Springer Nature.
4	Nilakshi Jain, Artificial Intelligence: Making A System Intelligent, First Edition, Wiley.

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

CO	Course Outcomes	RBT Level	RBT Level Indicator
CO1	Explain the fundamental concepts of Artificial Intelligence, Generative AI and Machine Learning including their principles, types, and real-world significance.	L2	U
CO2	Apply AI, Gen AI and ML techniques such as search algorithms, regression, classification, clustering, and prompt engineering methods to solve basic computational problems.	L3	AP
CO3	Analyze different AI models, algorithms, and techniques and compare their performance, advantages, and limitations in various scenarios.	L4	AN
CO4	Evaluate the impact of AI technologies, trends, and applications in diverse domains like healthcare, finance, education, and agriculture.	L5	E

Mapping of Course Outcomes to Program Outcomes:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1																
CO2	3												2			
CO3		3														
CO4			3		2				2	2					2	

Weblinks and Video Lectures (e-Resources)

1	Elements of AI – https://www.elementsofai.com
2	CS50's Introduction to Artificial Intelligence with Python – Harvard https://cs50.harvard.edu/ai/
3	Google Machine Learning Crash Course – https://developers.google.com/machine-learning/crash-course
4	Learn Prompting (Open-Source Guide) – https://learnprompting.org
5	Google AI – Learn with Google AI https://ai.google/education/
6	Coursera – Machine Learning by Andrew Ng (Stanford University) https://www.coursera.org/learn/machine-learning
7	OpenAI Prompt Engineering Guide (for ChatGPT) https://platform.openai.com/docs/guides/gpt-best-practices
8	Prompt Engineering for Developers – DeepLearning.AI + OpenAI https://www.deeplearning.ai/short-courses/chatgpt-prompt-engineering-for-developers/
9	Ethics in AI – Google Responsible AI Practices https://ai.google/responsibilities/responsible-ai-practices/
10	Google Teachable Machine (Train AI models visually without code) https://teachablemachine.withgoogle.com

CIE- Continuous Internal Evaluation (50 Marks)

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

CIE Course Assessment Plan

	Marks Distribution						Total Marks	Weightage
	Test-1			Test-2				
	Module 1	Module 2	Module 2 to 2.5	Module-2.5 to 3	Module- 4	Module- 5		
CO1	10	5	5	5	5	5	35	25%
CO2	10	10	5	5	10	10	50	25%
CO3		5			5	5	15	35%
CO4								15%
CO5								--
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	10% + 2%
Apply	20% + 2%
Analyze	40% + 4%
Evaluate	20% + 2%
Create	

CO's	Marks Distribution					Total Marks	Weightage
	Module-1	Module-2	Module- 3	Module-4	Module-5		
CO1	20	10				30	30%
CO2		10	10	10	10	40	40%
CO3			10	10	10	30	30%
CO4							-
CO5							-
Total	20	20	20	20	20	100	100%

SEE Marks Distribution



Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	2 nd			
Course Title	:	Introduction to Python Programming			
Course Code	:	BPLCS201			
Course Type (Theory/ Practical/ Integrated)	:	Integrated			
Category	:	PLC			
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

Pedagogical Initiatives:

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 encourage team building.
4. Ask 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
Pedagogy	Think Pair and Share (Blended Learning): provides an opportunity for students to learn from one another	
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
Pedagogy	Problem Solving: encourages cognitive thinking and enables creative problem solving	
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, Pattern matching without Regular Expressions	5
Pedagogy	Poster Presentation: allows students to represent the concepts visually in order to understand the topics easily	
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.	5
Pedagogy	Case studies: maps different domains in real time applications	
5	Invoking a Method, Using Constructor, Using Class Attributes and Static Methods. Object Oriented Programming: Encapsulation, Polymorphism, Abstraction, Inheritance.	6
Pedagogy	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 check whether a given number is palindrome or not and also count the number of occurrences of each digit in the input number. b. Develop a python program that could search the text in a file for phone numbers (+919900889977) and email addresses (<u>sample@gmail.com</u>).	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 <code>_init_()</code> method to initialize name, USN and the lists to store marks and total, Use <code>getMarks()</code> method to read marks into the list, and <code>display()</code> method to display the score card details.].	CO3
10.	Develop a Python program to demonstrate single inheritance using the following scenario: Create a base class LibraryItem with: Attributes: title, category and year. A method: <code>display_details()</code> to print these details. Create a derived class Book that inherits from LibraryItem and adds: Attributes: author and ISBN. A method: to display all details (including base class attributes).	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 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.

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year) change format

1.	Automate the Boring Stuff with Python , Al Sweigart, No Starch Press, 1 st Edition, 2015
2.	Think Python: How to Think Like a Computer Scientist , Allen B. Downey, , Green Tea Press2 nd Edition,2015.
3.	Python for data analysis ,Wes Mckinney, O'Rely Publications,3 rd edition ,2023
4.	Scientific Computing with Python: High-performance scientific computing with NumPy, SciPy, and pandas by Claus Fuhrer, Jan Erik Solem, Olivier Verdier, Pakt publications ,2 nd Edition , 2021

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

[illegible]

CO4	--	2	2	--	1	--	--	--		2	2	--	--	--	--
CO5	--	1	1	--	2	--	--	--	1	2	2	--	--	--	--

List of AI Tools to be Used (Not limited to)

GitHub Copilot, Replit : These tools used for lab coding and practice

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_01282535449306726468422_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	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) / 2	15	6	Average of Two Internal test each of 50 Marks scale down the marks to 15 Marks
		Internal Assessment Test (IAT) - II	Module - 3 4,& 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				

CIE	Total CIE Theory					25	10	Scale down Marks of IAT and CCA to 25	
	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 (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 (Review 1)	CCA-2 (Review 2)	
	50 Marks	50 Marks	50 Marks	20 Marks	30 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%

Course Contents and Lecture Schedule:

Module No.	Topics	No. of Lectures
1	Python Basics: Entering Expressions into the Interactive Shell. The Integer, Floating-Point, and String Data Types, String Concatenation and Replication	1
1	Storing Values in Variables, First Program, Dissecting Your Program	1
1	Flow control: Boolean Values, Comparison Operators, Boolean Operators	1
1	Mixing Boolean and Comparison Operators,	1
1	Elements of Flow Control, Program Execution, Flow Control Statements	1
1	Importing Modules.	1
2	Functions: def Statements with Parameters, Return Values and return Statements.	1
2	The None Value, Keyword Arguments and print ().	1
2	Local and Global Scope, The global Statement	1
2	Exception Handling, Recursion.	1
2	Lists: The List Data Type, Working with Lists, Methods	1
2	List Memory management List-like Types. Tuples- Working with Tuples	1
3	Dictionaries: The Dictionary Data Type, Method, Working with dictionaries.	1
3	Types, data set handling with dictionaries, Pretty Printing.	1
3	Strings: Working with Strings, Useful String Methods,	1
3	Pattern matching with Regular Expressions	1

3	Patten matching without Regular Expressions	1
4	Files operations: Files and File Paths, The os. path Module,	1
4	File Operations , Compressing Files with the zip file, exception handling.	1
4	Classes and objects: Defining a Class, Defining a Method	1
4	Instantiating an Object	1
5	Invoking a Method	1
5	Using Constructor, Using Class Attributes	1
5	Static Methods	1
5	Object-Oriented Programming: Encapsulation	1
5	Polymorphism	1
5	Abstraction	1
5	Inheritance	1
1 - 5	Laboratory Programs	8
	Project periodic reviews	4
Total Number of Hours		40



Dayananda Sagar Academy of Technology & Management

(Autonomous Institute under VTU)

Semester	:	2 nd			
Course Title	:	Professional Writing Skills in English			
Course Code	:	BCENC206			
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.



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_KhhZvZI/view?usp=drive_link

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

1 Credit Courses – Theory

Assessme nt 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		

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%
CO6	13	10	09	10	8	50	100%
Total							

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	:	1 st / 2 nd			
Course Title	:	Indian Constitution			
Course Code	:	BICNC107 / BICNC207			
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 about the

Sl. No	Course Objectives
1	The basic structure of Indian Constitution.
2	The Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.
3	The Union Government, political structure & codes, procedures.
4	The State Executive & Elections system of India.
5	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	Module 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	Module 2: Fundamental Rights and Directive Principles of State Policy 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	Module 3: The Union Executive 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	Module 4: The State Executive 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	Module 5: Elections, Emergency Provisions and Constitutional Amendments 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	The Indian Constitution: A Ready Reference Textbook as per VTU Syllabus, by Dr. Abhinav, Shashwat Publication, First Edition, 2023.
2	Constitution of India with important Case Laws, MCQs covering Constitutional Aspects of Indian Polity for Students, Competitive/ Civil Services Exams, Legal Fraternity, Practitioners, Legal, by Professionals, Professional Book Publishers, Edition-1, 2023.
3	Introduction to the Constitution of India, by Durga Das Basu, Lexis Nexis Publication, 24th Edition, 2019.
4	Constitution of India, Professional Ethics and Human Rights by Shubham Singles, Charles E. Haries, and et al., Cengage India Pvt.Ltd. Publications, Latest Edition, 2019.
5	Constitution of India -For Competitive Exams - Naidhruva Edutech Learning Solutions Publication, Latest 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 and recall the concepts related to the Indian Constitution such as its historical context, key framers, structure, and basic functions.	Understand	L2
CO2	Comprehend the significance and principles underlying Fundamental Rights, Directive Principles of State Policy, and Fundamental Duties within the Indian Constitution	Understand	L2
CO3	Comprehend and grasp 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	--	--	--	--	--	02	--	--
CO2	--	--	--	--	--	3	--	--	--	--	--	02	--	--
CO3	--	--	--	--	--	3	--	--	--	--	--	02	--	--
CO4	--	--	--	--	--	3	--	--	--	--	--	02	--	--
CO5	--	--	--	--	--	3	--	--	--	--	--	02	--	--

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

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	
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	Module 1: Introduction to the Indian constitution 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	Module 2: Fundamental Rights and Directive Principles of State Policy 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	Module 3: The Union Executive 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	Module 4: The State Executive 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	Module 5: Elections, Emergency Provisions and Constitutional Amendments 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	:	2 nd			
Course Title	:	Engineering Exploration Course			
Course Code	:	BEEXC208			
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=EAlaIQobChMIsf3N4bD3_wlVHAyDAX1a5wkrEAAYASAAEgJNe_D_BwE
2	https://www.mooc-list.com/tags/design-thinking?__cf_chl_tk=OiyDIM1QC0P7pJVSWWWpKKITaJH2pBsQoyI9laeWj.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