

**I Semester**

Course Title:	<b>Mathematics-I for Computer Science and Engineering stream</b>		
Course Code:	<b>BMATS101</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated )	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours Theory + 10 to 12 Lab slots	Credits	04

**Course objectives:** The goal of the course **Mathematics-I for Computer Science and Engineering stream (22MATS11)** is to

- **Familiarize** the importance of calculus associated with one variable and multivariable for computer science and engineering.
- **Analyze** Computer science and engineering problems by applying Ordinary Differential Equations.
- **Apply** the knowledge of modular arithmetic to computer algorithms.
- **Develop** the knowledge of Linear Algebra to solve the system of equations.

**Teaching-Learning Process****Pedagogy (General Instructions):**

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

1. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the delivered lessons shall develop students' theoretical and applied mathematical skills.
2. State the need for Mathematics with Engineering Studies and Provide real-life examples.
3. Support and guide the students for self-study.
4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress.
5. Encourage the students to group learning to improve their creative and analytical skills.
6. Show short related video lectures in the following ways:
  - As an introduction to new topics (pre-lecture activity).
  - As a revision of topics (post-lecture activity).
  - As additional examples (post-lecture activity).
  - As an additional material of challenging topics (pre-and post-lecture activity).
  - As a model solution of some exercises (post-lecture activity).

**Module-1:Calculus (8 hours)****Introduction to polar coordinates and curvature relating to Computer Science and Engineering.**

Polar coordinates, Polar curves, angle between the radius vector and the tangent, angle between two curves. Pedal equations. Curvature and Radius of curvature - Cartesian, Parametric, Polar and Pedal forms. Problems.

**Self-study:** Center and circle of curvature, evolutes and involutes.

**Applications:** Computer graphics, Image processing.

**(RBT Levels: L1, L2 and L3)**

**Module-2:Series Expansion and Multivariable Calculus (8 hours)**

**Introduction of series expansion and partial differentiation in Computer Science & Engineering applications.**

Taylor's and Maclaurin's series expansion for one variable (Statement only) – problems. Indeterminate forms - L'Hospital's rule-Problems.

Partial differentiation, total derivative - differentiation of composite functions. Jacobian and problems. Maxima and minima for a function of two variables. Problems.

**Self-study:** Euler's theorem and problems. Method of Lagrange's undetermined multipliers with single constraint.

**Applications:** Series expansion in computer programming, Computing errors and approximations.

(RBT Levels: L1, L2 and L3)

**Module-3: Ordinary Differential Equations (ODEs) of First Order (8 hours)**
**Introduction to first-order ordinary differential equations pertaining to the applications for Computer Science & Engineering.**

Linear and Bernoulli's differential equations. Exact and reducible to exact differential equations - Integrating factors on  $\frac{1}{N} \left( \frac{\partial M}{\partial y} - \frac{\partial N}{\partial x} \right)$  and  $\frac{1}{M} \left( \frac{\partial N}{\partial x} - \frac{\partial M}{\partial y} \right)$ . Orthogonal trajectories, L-R & C-R circuits. Problems.

**Non-linear differential equations:** Introduction to general and singular solutions, Solvable for p only, Clairaut's equations, reducible to Clairaut's equations. Problems.

**Self-Study:** Applications of ODEs, Solvable for x and y.

**Applications of ordinary differential equations:** Rate of Growth or Decay, Conduction of heat.

(RBT Levels: L1, L2 and L3)

**Module-4: Modular Arithmetic (8 hours)**
**Introduction of modular arithmetic and its applications in Computer Science and Engineering.**

Introduction to Congruences, Linear Congruences, The Remainder theorem, Solving Polynomials, Linear Diophantine Equation, System of Linear Congruences, Euler's Theorem, Wilson Theorem and Fermat's little theorem. Applications of Congruences-RSA algorithm.

**Self-Study:** Divisibility, GCD, Properties of Prime Numbers, Fundamental theorem of Arithmetic.

**Applications:** Cryptography, encoding and decoding, RSA applications in public key encryption.

(RBT Levels: L1, L2 and L3)

**Module-5: Linear Algebra (8 hours)**
**Introduction of linear algebra related to Computer Science & Engineering.**

Elementary row transformation of a matrix, Rank of a matrix. Consistency and Solution of system of linear equations - Gauss-elimination method, Gauss-Jordan method and approximate solution by Gauss-Seidel method. Eigenvalues and Eigenvectors, Rayleigh's power method to find the dominant Eigenvalue and Eigenvector.

**Self-Study:** Solution of system of equations by Gauss-Jacobi iterative method. Inverse of a square matrix by Cayley-Hamilton theorem.

**Applications:** Boolean matrix, Network Analysis, Markov Analysis, Critical point of a network system. Optimum solution.

(RBT Levels: L1, L2 and L3).



**List of Laboratory experiments (2 hours/week per batch/ batch strength 15)****10 lab sessions + 1 repetition class + 1 Lab Assessment**

1	2D plots for Cartesian and polar curves
2	Finding angle between polar curves, curvature and radius of curvature of a given curve
3	Finding partial derivatives and Jacobian
4	Applications to Maxima and Minima of two variables
5	Solution of first-order ordinary differential equation and plotting the solution curves
6	Finding GCD using Euclid's Algorithm
7	Solving linear congruences $ax \equiv b \pmod{m}$
8	Numerical solution of system of linear equations, test for consistency and graphical representation
9	Solution of system of linear equations using Gauss-Seidel iteration
10	Compute eigenvalues and eigenvectors and find the largest and smallest eigenvalue by Rayleigh power method.

**Suggested software:** Mathematica/MatLab/Python/Scilab**Course outcome (Course Skill Set)**

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

CO1	apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
CO2	analyze the solution of linear and nonlinear ordinary differential equations
CO3	get acquainted and to apply modular arithmetic to computer algorithms
CO4	make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
CO5	familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/ PYTHON/ SCILAB

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 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 **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester/after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (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 by University 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/Kannada). 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 students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally 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.

#### **Suggested Learning Resources:**

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

##### **Text Books**

1. **B. S. Grewal:** "Higher Engineering Mathematics", Khanna Publishers, 44<sup>th</sup> Ed., 2021.
2. **E. Kreyszig:** "Advanced Engineering Mathematics", John Wiley & Sons, 10<sup>th</sup> Ed., 2018.
3. **David M Burton:** "Elementary Number Theory" Mc Graw Hill, 7<sup>th</sup> Ed., 2017.

##### **Reference Books**

4. **V. Ramana:** "Higher Engineering Mathematics" McGraw-Hill Education, 11<sup>th</sup> Ed., 2017
5. **Srimanta Pal & Subodh C. Bhunia:** "Engineering Mathematics" Oxford University Press, 3<sup>rd</sup> Ed., 2016.
6. **N.P Bali and Manish Goyal:** "A Textbook of Engineering Mathematics" Laxmi



- Publications, 10<sup>th</sup> Ed., 2022.
7. **C. Ray Wylie, Louis C. Barrett:** "Advanced Engineering Mathematics" McGraw – Hill Book Co., New York, 6<sup>th</sup> Ed., 2017.
  8. **Gupta C.B, Sing S.R and Mukesh Kumar:** "Engineering Mathematic for Semester I and II", Mc-Graw Hill Education(India) Pvt. Ltd 2015.
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  10. **James Stewart:** "Calculus" Cengage Publications, 7<sup>th</sup> Ed., 2019.
  11. **David C Lay:** "Linear Algebra and its Applications", Pearson Publishers, 4<sup>th</sup> Ed., 2018.
  12. **Gareth Williams:** "Linear Algebra with Applications", Jones Bartlett Publishers Inc., 6<sup>th</sup> Ed., 2017.
  13. **Gilbert Strang:** "Linear Algebra and its Applications", Cengage Publications, 4<sup>th</sup> Ed. 2022.
  14. **William Stallings:** "Cryptography and Network Security" Pearson Prentice Hall, 6<sup>th</sup> Ed., 2013.
  15. **Kenneth H Rosen:** "Discrete Mathematics and its Applications" McGraw-Hill, 8<sup>th</sup> Ed. 2019.
  16. **Ajay Kumar Chaudhuri:** "Introduction to Number Theory" NCBA Publications, 2<sup>nd</sup> Ed., 2009.
  17. **Thomas Koshy:** "Elementary Number Theory with Applications" Harcourt Academic Press, 2<sup>nd</sup> Ed., 2008.

#### Web links and Video Lectures (e-Resources):

- <http://nptel.ac.in/courses.php?disciplineID=111>
- [http://www.class-central.com/subject/math\(MOOCs\)](http://www.class-central.com/subject/math(MOOCs))
- <http://academicearth.org/>
- VTU e-Shikshana Program
- VTU EDUSAT Program

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

- Quizzes
- Assignments
- Seminar

#### COs and POs Mapping (Individual teacher has to fill up)

COs	POs						
	1	2	3	4	5	6	7
CO1							
CO2							
CO3							
CO4							
CO5							

Level 3- Highly Mapped,

Level 2-Moderately Mapped,

Level 1-Low Mapped,

Level 0- Not Mapped



H.O.D

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Alva's Institute of Engg. & Technology  
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**II Semester**

Course Title:	<b>Mathematics-II for Computer Science and Engineering stream</b>		
Course Code:	<b>BMATS201</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours Theory + 10 to 12 Lab slots	Credits	04

**Course objectives:** The goal of the course **Mathematics-II for Computer Science and Engineering stream (22MATS21)** is to

- **Familiarize** the importance of Integral calculus and Vector calculus.
- **Learn** vector spaces and linear transformations.
- **Develop** the knowledge of numerical methods and apply them to solve transcendental and differential equations.

**Teaching-Learning Process****Pedagogy (General Instructions):**

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

1. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the delivered lessons shall develop students' theoretical and applied mathematical skills.
2. State the need for Mathematics with Engineering Studies and Provide real-life examples.
3. Support and guide the students for self-study.
4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress.
5. Encourage the students to group learning to improve their creative and analytical skills.
6. Show short related video lectures in the following ways:
  - As an introduction to new topics (pre-lecture activity).
  - As a revision of topics (post-lecture activity).
  - As additional examples (post-lecture activity).
  - As an additional material of challenging topics (pre-and post-lecture activity).
  - As a model solution of some exercises (post-lecture activity).

**Module-I Integral Calculus (8 hours)****Introduction to Integral Calculus in Computer Science & Engineering.**

**Multiple Integrals:** Evaluation of double and triple integrals, evaluation of double integrals by change of order of integration, changing into polar coordinates. Applications to find Area and Volume by double integral. Problems.

**Beta and Gamma functions:** Definitions, properties, relation between Beta and Gamma functions. Problems.

**Self-Study:** Center of gravity, Duplication formula.

**Applications:** Antenna and wave propagation, Calculation of optimum value in various geometries. Analysis of probabilistic models.

**(RBT Levels: L1, L2 and L3)**



**Module-2 Vector Calculus(8 hours)****Introduction to Vector Calculus in Computer Science & Engineering.**

Scalar and vector fields, Gradient, directional derivative, curl and divergence - physical interpretation, solenoidal and irrotational vector fields. Problems.

**Curvilinear coordinates:** Scale factors, base vectors, Cylindrical polar coordinates, Spherical polar coordinates, transformation between cartesian and curvilinear systems, orthogonality. Problems.

**Self-Study:** Vector integration and Vector line integral.

**Applications:** Conservation of laws, Electrostatics, Analysis of streamlines.

**Module-3 Vector Space and Linear Transformations(8 hours)****Importance of Vector Space and Linear Transformations in the field of Computer Science & Engineering.**

**Vector spaces:** Definition and examples, subspace, linear span, Linearly independent and dependent sets, Basis and dimension. Problems.

**Linear transformations:** Definition and examples, Algebra of transformations, Matrix of a linear transformation. Change of coordinates, Rank and nullity of a linear operator, rank-nullity theorem. Inner product spaces and orthogonality. Problems.

**Self-study:** Angles and Projections. Rotation, Reflection, Contraction and Expansion.

**Applications:** Image processing, AI & ML, Graphs and networks, Computer graphics.

(RBT Levels: L1, L2 and L3)

**Module-4 Numerical Methods -1(8 hours)****Importance of numerical methods for discrete data in the field of computer science & engineering.**

Solution of algebraic and transcendental equations - Regula-Falsi and Newton-Raphson methods (only formulae). Problems.

Finite differences, Interpolation using Newton's forward and backward difference formulae, Newton's divided difference formula and Lagrange's interpolation formula (All formulae without proof). Problems.

**Numerical integration:** Trapezoidal, Simpson's  $(1/3)^{rd}$  and  $(3/8)^{th}$  rules (without proof). Problems.

**Self-Study:** Bisection method, Lagrange's inverse Interpolation.

**Applications:** Estimating the approximate roots, extremum values, Area, volume, and surface area. Errors in finite precision.

(RBT Levels: L1, L2 and L3)

**Module-5 Numerical Methods -2(8 hours)****Introduction to various numerical techniques for handling Computer Science & Engineering applications.**

**Numerical Solution of Ordinary Differential Equations (ODE's):** Numerical solution of ordinary differential equations of first order and first degree - Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order and Milne's predictor-corrector formula (No derivations of formulae). Problems.

**Self-Study:** Adam-Bashforth method.

**Applications:** Estimating the approximate solutions of ODE.

(RBT Levels: L1, L2 and L3).

**List of Laboratory experiments (2 hours/week per batch/ batch strength 15)****10 lab sessions + 1 repetition class + 1 Lab Assessment**

1	Program to compute area, surface area, volume and centre of gravity
2	Evaluation of improper integrals
3	Finding gradient, divergent, curl and their geometrical interpretation
4	Computation of basis and dimension for a vector space and Graphical representation of linear transformation
5	Computing the inner product and orthogonality
6	Solution of algebraic and transcendental equations by Ramanujan's, Regula-Falsi and Newton-Raphson method
7	Interpolation/Extrapolation using Newton's forward and backward difference formula
8	Computation of area under the curve using Trapezoidal, Simpson's $(1/3)^{rd}$ and $(3/8)^{th}$ rule
9	Solution of ODE of first order and first degree by Taylor's series and Modified Euler's method
10	Solution of ODE of first order and first degree by Runge-Kutta $4^{th}$ order and Milne's predictor-corrector method

**Suggested software's:** Mathematica/MatLab/Python/Scilab

**Course outcome (Course Skill Set)**

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

CO1	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume.
CO2	Understand the applications of vector calculus refer to solenoidal, and irrotational vectors. Orthogonal curvilinear coordinates.
CO3	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
CO4	Apply the knowledge of numerical methods in analysing the discrete data and solving the physical and engineering problems.
CO5	Get familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB /PYTHON/ SCILAB

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.



- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 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 **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester/after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (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):**

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- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally 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.

**List of Laboratory experiments (2 hours/week per batch/ batch strength 15)**  
**10 lab sessions + 1 repetition class + 1 Lab Assessment**

1	Program to compute area, surface area, volume and centre of gravity
2	Evaluation of improper integrals
3	Finding gradient, divergent, curl and their geometrical interpretation
4	Computation of basis and dimension for a vector space and Graphical representation of linear transformation
5	Computing the inner product and orthogonality
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**Suggested software's:** Mathematica/MatLab/Python/Scilab

**Course outcome (Course Skill Set)**

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**Continuous Internal Evaluation(CIE):**

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9. **Gareth Williams:** "Linear Algebra with applications", Jones Bartlett Publishers Inc., 6<sup>th</sup> Ed., 2017.
10. **Gilbert Strang:** "Linear Algebra and its Applications", Cengage Publications, 4<sup>th</sup> Ed., 2022.

**Web links and Video Lectures (e-Resources):**

- <http://nptel.ac.in/courses.php?disciplineID=111>
- [http://www.class-central.com/subject/math\(MOOCs\)](http://www.class-central.com/subject/math(MOOCs))
- <http://academicearth.org/>
- VTU e-Shikshana Program
- VTU EDUSAT Program

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

- Quizzes
- Assignments
- Seminar

**COs and POs Mapping (Individual teacher has to fill up)**

COs	POs						
	1	2	3	4	5	6	7
CO1							
CO2							
CO3							
CO4							
CO5							

Level 3- Highly Mapped,

Level 2-Moderately Mapped,

Level 1-Low Mapped,

Level 0- Not Mapped

H.O.D

Course Title:	Applied Physics for CSE Stream		
Course Code:	BPHYS102/202	CIE Marks	50
Course Type (Theory/Practical/Integrated )	Integrated	SEE Marks	50
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Total Marks	100
Total Hours of Pedagogy	40 hours Theory + 10-12 Lab slots	Exam Hours	03
		Credits	04
<b>Course objectives</b> <ul style="list-style-type: none"> <li>To study the essentials of photonics and its application in computer science.</li> <li>To study the principles of quantum mechanics and its application in quantum computing.</li> <li>To study the electrical properties of materials</li> <li>To study the essentials of physics for computational aspects like design and data analysis.</li> </ul>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective <ol style="list-style-type: none"> <li>1. Flipped Class</li> <li>2. Chalk and Talk</li> <li>3. Blended Mode of Teaching and Learning</li> <li>4. Simulations, Interactive Simulations and Animations</li> <li>5. NPTEL and Other Videos for theory topics</li> <li>6. Smart Class Room</li> <li>7. Lab Experiment Videos</li> </ol>			
<b>Module-1 (8 Hours)</b>			
<b>Laser and Optical Fibers:</b> <b>LASER:</b> Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein's A and B Coefficients and Expression for Energy Density (Derivation), Laser Action, Population Inversion, Metastable State, Requisites of a laser system, Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems. <b>Optical Fiber:</b> Principle and Structure, Propagation of Light, Acceptance angle and Numerical Aperture (NA), Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers, Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems  <b>Pre requisite: Properties of light</b> <b>Self-learning: Total Internal Reflection</b>			
<b>Module-2 (8 Hours)</b>			
<b>Quantum Mechanics:</b> 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, Waveforms and Probabilities. Numerical Problems.  <b>Pre requisite: Wave-Particle dualism</b> <b>Self-learning: de Broglie Hypothesis</b>			
<b>Module-3 (8 Hours)</b>			
<b>Quantum Computing:</b> <b>Principles of Quantum Information &amp; Quantum Computing:</b> Introduction to Quantum Computing, Moore's law & its end, Differences between Classical & Quantum computing. Concept of qubit and its properties. Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.  <b>Dirac representation and matrix operations:</b> Matrix representation of 0 and 1 States, Identity Operator I. Applying I to $ 0\rangle$ and $ 1\rangle$ states, Pauli Matrices and its			



operations on  $|0\rangle$  and  $|1\rangle$  states, Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U. Examples: Row and Column Matrices and their multiplication (Inner Product), Probability, and Quantum Superposition, normalization rule, Orthogonality, Orthonormality. Numerical Problems

**Quantum Gates:**

**Single Qubit Gates:** Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate

**Multiple Qubit Gates:** Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of Swap gate, Controlled -Z gate, Toffoli gate.

**Pre requisites:** Matrices

**Self-learning:** Moore's law

**Module-4 (8 Hours)**

**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, Josephson Junctions (Qualitative), DC and RF SQUIDS (Qualitative), Applications in Quantum Computing: Charge, Phase and Flux qubits, Numerical Problems.

**Pre requisites:** Basics of Electrical conductivity

**Self-learning:** Resistivity and Mobility

**Module-5 (8 hours)**

**Applications of Physics in computing:**

**Physics of Animation:**

Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale, Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration, The Odd rule, Odd-rule Scenarios, Motion Graphs, Examples of Character Animation: Jumping, Parts of Jump, Jump Magnification, Stop Time, Walking: Strides and Steps, Walk Timing. Numerical Problems

**Statistical Physics for Computing:** Descriptive statistics and inferential statistics, Poisson distribution and modeling the probability of proton decay, Normal Distributions (Bell Curves), Monte Carlo Method: Determination of Value of  $\pi$ . Numerical Problems.

**Pre requisites:** Motion in one dimension, Probability

**Self-learning:** Frames, Frames per Second

**Course outcome (Course Skill Set)**

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

CO1	<b>Describe</b> the principles of LASERS and Optical fibers and their relevant applications.
CO2	<b>Discuss</b> the basic principles of the Quantum Mechanics and its application in Quantum Computing.
CO3	<b>Summarize</b> the essential properties of superconductors and its applications in qubits.
CO4	<b>Illustrate</b> the application of physics in design and data analysis.
CO5	<b>Practice</b> working in groups to conduct experiments in physics and <b>perform</b> precise and honest measurements.

**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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Course Title:	Applied Physics for CSE Stream		
Course Code:	BPHYS102/202	CIE Marks	50
Course Type (Theory/Practical/Integrated )	Integrated	SEE Marks	50
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Total Marks	100
Total Hours of Pedagogy	40 hours Theory + 10-12 Lab slots	Exam Hours	03
		Credits	04
<b>Course objectives</b> <ul style="list-style-type: none"> <li>To study the essentials of photonics and its application in computer science.</li> <li>To study the principles of quantum mechanics and its application in quantum computing.</li> <li>To study the electrical properties of materials</li> <li>To study the essentials of physics for computational aspects like design and data analysis.</li> </ul>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective <ol style="list-style-type: none"> <li>1. Flipped Class</li> <li>2. Chalk and Talk</li> <li>3. Blended Mode of Teaching and Learning</li> <li>4. Simulations, Interactive Simulations and Animations</li> <li>5. NPTEL and Other Videos for theory topics</li> <li>6. Smart Class Room</li> <li>7. Lab Experiment Videos</li> </ol>			
<b>Module-1 (8 Hours)</b>			
<b>Laser and Optical Fibers:</b> <b>LASER:</b> Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein's A and B Coefficients and Expression for Energy Density (Derivation), Laser Action, Population Inversion, Metastable State, Requisites of a laser system, Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems. <b>Optical Fiber:</b> Principle and Structure, Propagation of Light, Acceptance angle and Numerical Aperture (NA), Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers, Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems  <b>Pre requisite:Properties of light</b> <b>Self-learning: Total Internal Reflection</b>			
<b>Module-2 (8 Hours)</b>			
<b>Quantum Mechanics:</b> 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, Waveforms and Probabilities. Numerical Problems.  <b>Pre requisite:Wave-Particle dualism</b> <b>Self-learning: de Broglie Hypothesis</b>			
<b>Module-3 (8 Hours)</b>			
<b>Quantum Computing:</b> <b>Principles of Quantum Information &amp; Quantum Computing:</b> Introduction to Quantum Computing, Moore's law & its end, Differences between Classical & Quantum computing. Concept of qubit and its properties. Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.  <b>Dirac representation and matrix operations:</b> Matrix representation of 0 and 1 States, Identity Operator I. Applying I to $ 0\rangle$ and $ 1\rangle$ states, Pauli Matrices and its			



**Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 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 **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (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 by University 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/Kannada). 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 students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally 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.

**Suggested Learning Resources:****Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8<sup>th</sup> Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
4. Concepts of Modern Physics, Aurther Beiser, McGrawhill, 6<sup>th</sup> Edition, 2009.
5. Lasers and Non Linear Optics, B B Loud, New age international, 2011 edition.
6. A Textbook of Engineering Physics by M.N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
7. Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition.

8. Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.
9. Quantum Computing – A Beginner's Introduction, Parag K Lala, Indian Edition, Mc GrawHill, Reprint 2020.
10. Engineering Physics, S P Basavaraj, 2005 Edition, Subhash Stores.
11. Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.
12. Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations, Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli, Trends in Logic, Volume 48, Springer.
13. Statistical Physics: Berkely Physics Course, Volume 5, F. Reif, McGraw Hill.
14. Introduction to Superconductivity, Michael Tinkham, McGraw Hill, INC, II Edition

#### Web links and Video Lectures (e-Resources):

**LASER:** <https://www.youtube.com/watch?v=WgzynezPiyc>

**Superconductivity :** <https://www.youtube.com/watch?v=MT5Xl5ppn48>

**Optical Fiber :** [https://www.youtube.com/watch?v=N\\_kA8EpCUQo](https://www.youtube.com/watch?v=N_kA8EpCUQo)

**Quantum Mechanics :** <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>

**Quantum Computing :** <https://www.youtube.com/watch?v=jHoEjvuPoB8>

**Quantum Computing :** <https://www.youtube.com/watch?v=ZuvCUU2jD30>

**Physics of Animation :** [https://www.youtube.com/watch?v=kj1kaA\\_8Fu4](https://www.youtube.com/watch?v=kj1kaA_8Fu4)

**Statistical Physics Simulation :** [https://phet.colorado.edu/sims/html/plinko-probability/latest/plinko-probability\\_en.html](https://phet.colorado.edu/sims/html/plinko-probability/latest/plinko-probability_en.html)

**NPTEL Superconductivity:** <https://archive.nptel.ac.in/courses/115/103/115103108/>

**NPTEL Quantum Computing :** <https://archive.nptel.ac.in/courses/115/101/115101092>

**Virtual LAB :** <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>

**Virtual LAB :** <https://vlab.amrita.edu/index.php?sub=1&brch=189&sims=343&cnt=1>

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

<http://nptel.ac.in>

<https://swayam.gov.in>

[https://virtuallabs.merlot.org/vl\\_physics.html](https://virtuallabs.merlot.org/vl_physics.html)

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**Superconductivity :** <https://www.youtube.com/watch?v=MT5Xl5ppn48>

**Optical Fiber :** [https://www.youtube.com/watch?v=N\\_kA8EpCUQo](https://www.youtube.com/watch?v=N_kA8EpCUQo)

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**Quantum Computing :** <https://www.youtube.com/watch?v=jHoEjvuPoB8>

**Quantum Computing :** <https://www.youtube.com/watch?v=ZuvCUU2jD30>

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

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<https://phet.colorado.edu>

<https://www.myphysicslab.com>



**Laboratory Component:**

Any Ten Experiments have to be completed from the list of experiments

**Note:** The experiments have to be classified into

- a) Exercise
- b) Demonstration
- c) Structured Inquiry
- d) Open Ended

Based on the convenience classify the following experiments into above categories. Select at least one simulation/spreadsheet activity.

**List of Experiments**

1. Determination of wavelength of LASER using Diffraction Grating.
2. Determination of acceptance angle and numerical aperture of the given Optical Fiber.
3. Determination of Magnetic Flux Density at any point along the axis of a circular coil.
4. Determination of resistivity of a semiconductor by Four Probe Method
5. Study the I-V Characteristics of the Given Bipolar Junction Transistor.
6. Determination of dielectric constant of the material of capacitor by Charging and Discharging method.
7. Study the Characteristics of a Photo-Diode and to determine the power responsivity / Verification of Inverse Square Law of Intensity of Light.
8. Study the frequency response of Series & Parallel LCR circuits.
9. Determination of Planck's Constant using LEDs.
10. Determination of Fermi Energy of Copper.
11. Identification of circuit elements in a Black Box and determination of values of the components.
12. Determination of Energy gap of the given Semiconductor.
13. Step Interactive Physical Simulations.
14. Study of motion using spread Sheets
15. Study of Application of Statistics using spread sheets
16. PHET Interactive  
Simulations(<https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html.prototype>)

**COs and POs Mapping (Individual teacher has to fill up)**

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2	-	-	-	-	-	-	-	-	-	2
CO2	3	3	-	-	-	-	-	-	-	-	-	2
CO3	3	3	-	-	-	-	-	-	-	-	-	2
CO4	3	2	1	-	1	-	-	-	-	-	-	2
CO5	3	2	1	-	2	-	-	3	3	-	-	2

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped,

**Note :** The CO-PO mapping values are indicative. The course coordinator can alter the mapping using Competency and Performance Indicators mentioned in the AICTE Exam reforms.



**H.O.D**

**Dept. of Computer Science and Design**  
**Alva's Institute of Engg. & Technology**  
**Mijar, Moodubidra - 574 225**

## Computer Science and Engineering and allied branches(Chemistry group)

Course Title:	Applied Chemistry for Computer Science & Engineering stream		
Course Code:	BCHEES102/202	CEEMarks	50
Course Type(Theory/Practical/Integrated)	Integrated	SEEMarks	50
		Total Marks	100
TeachingHours/Week(L:T:P:S) <sup>1</sup>	2:2:2:0	Exam Hours	03
TotalHoursofPedagogy	40hoursTheory+ 10to12Labslots	Credits	04
<b>Courseobjectives</b> <ul style="list-style-type: none"> <li>Toenablestudentstoacquireknowledgeonprinciplesofchemistryforengineeringapplications.</li> <li>Todevelopanintuitiveunderstandingofchemistrybyemphasizingtherelatedbranchesofengineering.</li> <li>Toprovidestudentswithasolidfoundationinanalyticalreasoningrequiredtosolvesocietalproblems.</li> </ul>			
<b>Teaching-LearningProcess</b> Thesearesamplestrategies,whichteachercanusetoacceleratetheattainmentofthevariouscourseoutcomesandmakeTeaching-Learningmoreeffective <ul style="list-style-type: none"> <li>Tutorial&amp;remedialclassesforneedystudents(notregularT/R)</li> <li>ConductingMakeupclasses/Bridgecourses forneedystudents</li> <li>Demonstrationofconceptseitherbybuildingmodelsorbyindustryvisit</li> <li>Experimentsinlaboratoriesshallbeexecutedinblendedmode(conventionalornon-conventionalmethods)</li> <li>UseofICT-Onlinevideos,onlinecourses</li> <li>Useofonlineplatformsforassignments/Notes/Quizzes(Ex.Googleclassroom)</li> </ul>			
<b>MODULE1:SensorsandEnergySystems(8hr)</b>			
<b>Sensors:</b> Introduction, working, principle and applications of Conductometric sensors, Electrochemical sensors, Thermometric sensors (Flame photometry) and Optical sensors (colorimetry). Sensors for the measurement of dissolved oxygen (DO). Electrochemical sensors for the pharmaceuticals. Electrochemical gas sensors for SO <sub>x</sub> and NO <sub>x</sub> . Disposable sensors in the detection of biomolecules and pesticides.			
<b>Energy Systems:</b> Introduction to batteries, construction, working and applications of Lithium ion and Sodium ion batteries. Quantum Dot Sensitized Solar Cells (QDSSC's)-Principle, Properties and Applications.			
<b>Self-learning:</b> Types of electrochemical sensor, Gas sensor - O <sub>2</sub> sensor, Biosensor - Glucose sensors.			
<b>MODULE2:MaterialsforMemoryandDisplaySystems(8hr)</b>			
<b>Memory Devices:</b> Introduction, Basic concepts of electronic memory, History of organic/polymeric electronic memory devices, Classification of electronic memory devices,			

1.NOTE:Whereverthecontact hoursisnotsufficient,tutorialhourcanbeconvertedto theoryhours



types of organic memory devices (organic molecules, polymeric materials, organic-inorganic hybrid materials).

**Display Systems:** Photoactive and electroactive materials, Nanomaterials and organic materials used in optoelectronic devices. Liquid crystals (LC's) - Introduction, classification, properties and application in Liquid Crystal Displays (LCD's). Properties and application of Organic Light Emitting Diodes (OLED's) and Quantum Light Emitting Diodes (QLED's), Light emitting electrochemical cells.

**Self-learning:** Properties and functions of Silicon (Si), Germanium (Ge), Copper (Cu), Aluminium (Al), and Brominated flame retardants in computers.

### MODULE 3: Corrosion and Electrode System (8hr)

**Corrosion Chemistry:** Introduction, electrochemical theory of corrosion, types of corrosion - differential metal and differential aeration. Corrosion control - galvanization, anodization and sacrificial anode method. Corrosion Penetration Rate (CPR) - Introduction and numerical problem.

**Electrode System:** Introduction, types of electrodes. Ion selective electrode - definition, construction, working and applications of glass electrode. Determination of pH using glass electrode. Reference electrode - Introduction, calomel electrode - construction, working and applications of calomel electrode. Concentration cell - Definition, construction and Numerical problems.

**Analytical Techniques:** Introduction, principle and instrumentation of Conductometry; its application in the estimation of weak acid. Potentiometry; its application in the estimation of iron.

**Self-learning:** IR and UV-Visible spectroscopy.

### MODULE 4: Polymers and Green Fuels (8hr)

**Polymers:** Introduction, Molecular weight - Number average, weight average and numerical problems. Preparation, properties, and commercial applications of Kevlar. Conducting polymers - synthesis and conducting mechanism of polyacetylene and commercial applications.

**Green Fuels:** Introduction, construction and working of solar photovoltaic cell, advantages, and disadvantages. Generation of energy (green hydrogen) by electrolysis of water and its advantages.

**Self-learning:** Regenerative fuel cells

### MODULE 5: E-Waste Management (8hr)

**E-Waste:** Introduction, sources of e-waste, Composition, Characteristics, and Need of e-waste management. Toxic materials used in manufacturing electronic and electrical products, health hazards due to exposure to e-waste. Recycling and Recovery: Different approaches of recycling (separation, thermal treatments, hydrometallurgical extraction, pyrometallurgical methods, direct recycling). Extraction of gold from E-waste. Role of stakeholders in environmental management of e-waste (producers, consumers, recyclers, and statutory bodies).

**Self-learning:** Impact of heavy metals on environment and human health.

### PRACTICAL MODULE

A - Demonstration (any two) offline/virtual:

A1. Chemical Structure drawing using software: ChemDraw or ACD/ChemSketch

## Computer Science and Engineering and allied branches(Chemistry group)

<b>Course Title:</b>	<b>Applied Chemistry for Computer Science &amp; Engineering stream</b>		
<b>Course Code:</b>	<b>BCHES102/202</b>	CIEMarks	50
Course Type(Theory/Practical/Integrated)	Integrated	SEEMarks	50
		Total Marks	100
TeachingHours/Week(L:T:P:S) <sup>1</sup>	2:2:2:0	Exam Hours	03
TotalHoursofPedagogy	40hoursTheory+ 10to12Labslots	Credits	04
<b>Courseobjectives</b> <ul style="list-style-type: none"> <li>Toenablestudentstoacquireknowledgeonprinciplesofchemistryforengineeringapplications.</li> <li>Todevelopanintuitiveunderstandingofchemistrybyemphasizingtherelatedbranchesofengineering.</li> <li>Toprovidestudentswithasolidfoundationinanalyticalreasoningrequiredtosolvesocietalproblems.</li> </ul>			
<b>Teaching-LearningProcess</b> Thesearesamplestrategies,whichteachercanusetoacceleratetheattainmentofthevariouscourseoutcomesandmakeTeaching-Learningmoreeffective <ul style="list-style-type: none"> <li>Tutorial&amp;remedialclassesforneedystudents(notregularT/R)</li> <li>ConductingMakeupclasses/Bridgecourses forneedystudents</li> <li>Demonstrationofconceptseitherbybuildingmodelsorbyindustryvisit</li> <li>Experimentsinlaboratoryshallbeexecutedinblendedmode(conventionalornon-conventionalmethods)</li> <li>UseofICT-Onlinevideos,onlinecourses</li> <li>Useofonlineplatformsforassignments/Notes/Quizzes(Ex.Googleclassroom)</li> </ul>			
<b>MODULE1:SensorsandEnergySystems(8hr)</b>			
<b>Sensors:</b> Introduction, working, principle and applications of Conductometric sensors, Electrochemical sensors, Thermometric sensors (Flame photometry) and Optical sensors (colorimetry). Sensors for the measurement of dissolved oxygen (DO). Electrochemical sensors for the pharmaceuticals. Electrochemical gas sensors for SO <sub>x</sub> and NO <sub>x</sub> . Disposable sensors in the detection of biomolecules and pesticides.			
<b>Energy Systems:</b> Introduction to batteries, construction, working and applications of Lithium ion and Sodium ion batteries. Quantum Dot Sensitized Solar Cells (QDSSC's)-Principle, Properties and Applications.			
<b>Self-learning:</b> Types of electrochemical sensor, Gas sensor - O <sub>2</sub> sensor, Biosensor - Glucose sensors.			
<b>MODULE2:MaterialsforMemoryandDisplaySystems(8hr)</b>			
<b>Memory Devices:</b> Introduction, Basic concepts of electronic memory, History of organic/polymerelectronicmemorydevices, Classification of electronic memory devices,			

1.NOTE: Wherever the contact hours is not sufficient, tutorial hour can be converted to theory hours



A2. Determination of strength of an acid in Pb-acid battery  
A3. Synthesis of Iron-oxide Nanoparticles

A4. Electrolysis of water

**B-Exercise (compulsorily any 4 to be conducted):**

B1. Conductometric estimation of acid mixture

B2. Potentiometric estimation of FA using  $K_2Cr_2O_7$

B3. Determination of  $pK_a$  of vinegar using pH sensor (Glass electrode)

B4. Determination of rate of corrosion of mild steel by weight loss method

B5. Estimation of total hardness of water by EDTA method

**C-Structured Enquiry (compulsorily any 4 to be conducted):**

C1. Estimation of Copper present in electroplating effluent by optical sensor (colorimetry)

C2. Determination of Viscosity coefficient of lubricant (Ostwald's viscometer)

C3. Estimation of iron in TMT bar by diphenyl amine/external indicator method

C4. Estimation of Sodium present in soil/effluents sample using flame photometry

C5. Determination of Chemical Oxygen Demand (COD) of industrial wastewater sample

**D-Open Ended Experiments (any two):**

D1: Evaluation of acid content in beverages by using pH sensors and simulation.

D2. Construction of photovoltaic cell.

D3. Design an experiment to identify the presence of proteins in given sample.

D4. Searching suitable PDB file and target for molecular docking

**Course outcome (Course Skill Set)**

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

CO1.	Identify the terms processes involved in scientific and engineering and applications
CO2.	Explain the phenomena of chemistry to describe the methods of engineering processes
CO3.	Solve the problems in chemistry that are pertinent in engineering applications
CO4.	Apply the basic concepts of chemistry to explain the chemical properties and processes
CO5.	Analyze properties and multi processes associated with chemical substances in disciplinary situations

**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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation (CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 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 **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (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 by University 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/Kannada. 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 students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally 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.

#### **Suggested Learning Resources:**

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

1. Wiley Engineering Chemistry, Wiley India Pvt. Ltd. New Delhi, 2013-2<sup>nd</sup> Edition.
2. Engineering Chemistry, Satyaprakash & Manisha Agrawal, Khanna Book Publishing, Delhi
3. A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.
4. Essentials of Physical Chemistry, Bahl & Tuli, S. Chand Publishing
5. Applied Chemistry, Sunita Rattan, Kataria 5. Engineering Chemistry, Baskar, Wiley
6. Engineering Chemistry-I, D. Groukrishana, Vikas Publishing
7. A Textbook of Engineering Chemistry, SSDara & Dr. SSUmare, S Chand & Company Ltd., 12<sup>th</sup> Edition, 2011.
8. A Text Book of Engineering Chemistry, R. V. Gadag and Nityananda Shetty, I. K. International Publishing house, 2<sup>nd</sup> Edition, 2016.
9. Text Book of Polymer Science, F. W. Billmeyer, John Wiley & Sons, 4<sup>th</sup> Edition, 1999.
10. Nanotechnology A Chemical Approach to Nanomaterials, G. A. Ozin & A. C. Arsenault, RSC Publishing, 2005
11. Corrosion Engineering, M. G. Fontana, N. D. Greene, McGraw Hill Publications, New York, 3<sup>rd</sup> Edition, 1996.



12. Linden's Handbook of Batteries, Kirby W. Beard, Fifth Edition, McGraw Hill, 2019.
13. OLED Display Fundamentals and Applications, Takatoshi Tsujimura, Wiley-Blackwell, 2012
14. Supercapacitors: Materials, Systems, and Applications, Max Lu, Francois Beguin, Elzbieta Frackowiak, Wiley-VCH; 1st edition, 2013.
15. "Handbook on Electroplating with Manufacture of Electrochemicals", ASIAPACIFIC BUSINESS PRESS Inc., 2017. Dr. H. Panda,
16. Expanding the Vision of Sensor Materials. National Research Council 1995, Washington, DC: The National Academies Press. doi:10.17226/4782.
17. Engineering Chemistry, Edited by Dr. Mahesh Band and Dr. Roopashree B, Sunstar Publisher, Bengaluru, ISBN 978-93-85155-70-3, 2022
18. High Performance Metallic Materials for Cost Sensitive Applications, F.H. Froes, et al. John Wiley & Sons, 2010
19. Instrumental Methods of Analysis, Dr. K.R. Mahadik and Dr. L. Sathiyarayanan, Nirali Prakashan, 2020
20. Principles of Instrumental Analysis, Douglas A. Skoog, F. James Holler, Stanley R. Crouch Seventh Edition, Cengage Learning, 2020
21. Polymer Science, V.R. Gowarikar, N.V. Viswanathan, Jayadev, Sreedhar, New Age Int. Publishers, 4th Edition, 2021
22. Engineering Chemistry, P.C. Jain & Monica Jain, Dhanpat Rai Publication, 2015-16th Edition.
23. Nanostructured materials and nanotechnology, Hari Singh, Nalwa, Academic Press, 1st Edition, 2002.
24. Nanotechnology Principles and Practices, Sulabha K. Kulkarni, Capital Publishing Company, 3rd Edition 2014
25. Principles of nanotechnology, Phanikumar, Scitech Publications, 2nd Edition, 2010.
26. Chemistry for Engineering Students, B.S. Jai Prakash, R. Venugopal, Sivakumaraiah & Pushpa Iyengar, Subhash Publications, 5th Edition, 2014
27. "Engineering Chemistry", O.G. Palanna, Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint, 2015.
28. Chemistry of Engineering materials, Malini S, K.S. Anantha Raju, CBS Publishers Pvt. Ltd.,
29. Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

#### Web links and Video Lectures (e-Resources):

- <http://libgen.rs/>
- <https://nptel.ac.in/downloads/122101001/>
- <https://nptel.ac.in/courses/104/103/104103019/>
- <https://ndl.iitkgp.ac.in/>
- <https://www.youtube.com/watch?v=faESCxAWR9k>
- <https://www.youtube.com/watch?v=TBqXMWaxZYM&list=PLyhmwFtznRhuz8L1bb3X-9IbHrDMjHWWWh>
- <https://www.youtube.com/watch?v=j5Hml6KN4TI>
- <https://www.youtube.com/watch?v=X9GHBdyYcyo>
- <https://www.youtube.com/watch?v=1xWBPZnEJk8>
- <https://www.youtube.com/watch?v=wRAo-M8xBHM>

**ActivityBasedLearning(SuggestedActivitiesinClass)/PracticalBasedlearning**

- ☐ <https://www.vlab.co.in/broad-area-chemical-sciences>
- ☐ <https://demonstrations.wolfram.com/topics.php>
- ☐ <https://interestingengineering.com/science>

**COsandPOsMapping(Individualteacherhastofillup)**

	PO											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1				1					
CO2	3	1	1				1					
CO3	3	1	1				1					
CO4	3	1	1				1					
CO5	3	1	1				1					

**H.O.D**

**Dept. of Computer Science and Design**  
**Alva's Institute of Engg. & Technology**  
**Mijar, Moodubidre - 574 225**



<b>Module-2 (6 Hours of Pedagogy)</b>	
<p>Operators in C, Type conversion and typecasting.</p> <p><b>Decision control and Looping statements:</b> Introduction to decision control, Conditional branching statements, iterative statements, nested loops, break and continue statements, goto statement.</p> <p><b>Textbook: Chapter 9.15-9.16, 10.1-10.6</b></p>	
<b>Teaching-LearningProcess</b>	Chalkandtalkmethod/PowerPointPresentation
<b>Module-3 (8 Hours of Pedagogy)</b>	
<p>Functions: Introduction using functions, Function definition, function declaration, function call, return statement, passing parameters to functions, scope of variables, storage classes, recursive functions.</p> <p>Arrays: Declaration of arrays, accessing the elements of an array, storing values in arrays, Operations on arrays, Passing arrays to functions, two dimensional arrays, operations on two-dimensional arrays, two-dimensional arrays to functions, multidimensional arrays, applications of arrays.</p> <p>Textbook: Chapter 11.1-11.10, 12.1-12.10,12.12</p>	
<b>Teaching-LearningProcess</b>	Chalkandtalkmethod/PowerPointPresentation
<b>Module-4 (6 Hours of Pedagogy)</b>	
<p><b>Strings and Pointers:</b> Introduction, string taxonomy, operations on strings, Miscellaneous string and character functions, arrays of strings. <b>Pointers:</b> Introduction to pointers, declaring pointer variables, Types of pointers, Passing arguments to functions using pointers</p> <p><b>Textbook: Chapter 13.1-13.6, 14-14.7</b></p>	
<b>Teaching-LearningProcess</b>	Chalkandtalkmethod/PowerPointPresentation
<b>Module-5 (6 Hours of Pedagogy)</b>	
<p><b>Structure, Union, and Enumerated Data Type:</b> Introduction, structures and functions, Unions, unions inside structures, Enumerated data type.</p> <p><b>Files:</b> Introduction to files, using files in C, reading and writing data files. , Detecting end of file</p> <p><b>Textbook: Chapter 15.1 – 15.10, 16.1-16.5</b></p>	
<b>Teaching-LearningProcess</b>	Chalkandtalkmethod/PowerPointPresentation
<p><b>CourseOutcomes(CourseSkillSet)</b></p> <p>Attheendofthecoursethestudentwillbeableto:</p> <p>CO1. Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.</p> <p>CO 2. Apply programming constructs of C language to solve the real world problem</p> <p>CO 3.Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting</p> <p>CO 4.Explore user-defined data structures like structures, unions and pointers in implementing solutions</p>	

Course Title:	<b>Principles of Programming using C</b>	
Course Code:	<b>BPOPS103/203</b>	CIE Marks 50
Course Type (Theory/Practical /Integrated )	Integrated	SEE Marks 50
		Total Marks 100
Teaching Hours/Week (L:T:P: S)	2:0:2	Exam Hours 3+2
Total Hours of Pedagogy	40 hours	Credits 03
	<b>Course Objectives:</b>  CLO 1. Elucidate the basic architecture and functionalities of a Computer CLO 2. Apply programming constructs of C language to solve the real-world problems CLO 3. Explore user-defined data structures like arrays, structures and pointers in implementing solutions to problems CLO 4. Design and Develop Solutions to problems using structured programming constructs such as functions and procedures	
	<b>Teaching-Learning Process (General Instructions)</b>  These are sample strategies, which teachers can use to accelerate the attainment of the various course outcomes. <ol style="list-style-type: none"> <li>1. Lecturer method (L) need not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.</li> <li>2. Use of Video/Animation to explain functioning of various concepts.</li> <li>3. Encourage collaborative (Group Learning) Learning in the class.</li> <li>4. Ask at least three HOT (Higher order Thinking) questions in the class, which promote critical thinking.</li> <li>5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it.</li> <li>6. Introduce Topics in manifold representations.</li> <li>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.</li> <li>8. Discuss how every concept can be applied to the real world - and when that's possible, it helps to improve the students' understanding.</li> <li>9. Use <a href="https://pythontutor.com/visualize.html#mode=edit">https://pythontutor.com/visualize.html#mode=edit</a> in order to visualize the operations of C Programs</li> </ol>	
	<b>Module-1 (6 Hours of Pedagogy)</b>	
	<b>Introduction to C:</b> Introduction to computers, input and output devices, designing efficient programs. Introduction to C. Structure of C program. Files used in a C program. Compilers, Compiling and executing C programs, variables, constants, Input/output statements in C.	
	<b>Textbook: Chapter 1.1-1.9, 2.1-2.2, 8.1 - 8.6, 9.1-9.14</b>	
Teaching-Learning Process	Chalk and talk method/PowerPoint Presentation/ Web Content: <a href="https://tinyurl.com/4xmrexre">https://tinyurl.com/4xmrexre</a>	



Module-2 (6 Hours of Pedagogy)	
<p>Operators in C, Type conversion and typecasting.</p> <p><b>Decision control and Looping statements:</b> Introduction to decision control, Conditional branching statements, iterative statements, nested loops, break and continue statements, goto statement.</p> <p><b>Textbook: Chapter 9.15-9.16, 10.1-10.6</b></p>	
<b>Teaching-LearningProcess</b>	Chalkandtalkmethod/PowerPointPresentation
Module-3 (8 Hours of Pedagogy)	
<p>Functions: Introduction using functions, Function definition, function declaration, function call, return statement, passing parameters to functions, scope of variables, storage classes, recursive functions.</p> <p>Arrays: Declaration of arrays, accessing the elements of an array, storing values in arrays, Operations on arrays, Passing arrays to functions, two dimensional arrays, operations on two-dimensional arrays, two-dimensional arrays to functions, multidimensional arrays, applications of arrays.</p> <p>Textbook: Chapter 11.1-11.10, 12.1-12.10, 12.12</p>	
<b>Teaching-LearningProcess</b>	Chalkandtalkmethod/PowerPointPresentation
Module-4 (6 Hours of Pedagogy)	
<p><b>Strings and Pointers:</b> Introduction, string taxonomy, operations on strings, Miscellaneous string and character functions, arrays of strings. <b>Pointers:</b> Introduction to pointers, declaring pointer variables, Types of pointers, Passing arguments to functions using pointers</p> <p><b>Textbook: Chapter 13.1-13.6, 14-14.7</b></p>	
<b>Teaching-LearningProcess</b>	Chalkandtalkmethod/PowerPointPresentation
Module-5 (6 Hours of Pedagogy)	
<p><b>Structure, Union, and Enumerated Data Type:</b> Introduction, structures and functions, Unions, unions inside structures, Enumerated data type.</p> <p><b>Files:</b> Introduction to files, using files in C, reading and writing data files. , Detecting end of file</p> <p><b>Textbook: Chapter 15.1 – 15.10, 16.1-16.5</b></p>	
<b>Teaching-LearningProcess</b>	Chalkandtalkmethod/PowerPointPresentation
CourseOutcomes(CourseSkillSet)	
<p>At the end of the course the student will be able to:</p> <p>CO1. Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.</p> <p>CO 2. Apply programming constructs of C language to solve the real world problem</p> <p>CO 3. Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting</p> <p>CO 4. Explore user-defined data structures like structures, unions and pointers in implementing solutions</p>	

CO5.Design and Develop Solutions to problems using modular programming constructs using functions

### Programming Assignments

- 1 Simulation of a Simple Calculator.
- 2 Compute the roots of a quadratic equation by accepting the coefficients. Print appropriate messages.
- 3 An electricity board charges the following rates for the use of electricity: for the first 200 units 80 paise per unit; for the next 100 units 90 paise per unit; beyond 300 units Rs 1 per unit. All users are charged a minimum of Rs. 100 as meter charge. If the total amount is more than Rs 400, then an additional surcharge of 15% of total amount is charged. Write a program to read the name of the user, number of units consumed and print out the charges.
4. Write a C Program to display the following by reading the number of rows as input,

```

      1
    1 2 1
  1 2 3 2 1
1 2 3 4 3 2 1
-----
nth row

```

- 5 Implement Binary Search on Integers.
- 6 Implement Matrix multiplication and validate the rules of multiplication.
- 7 Compute  $\sin(x)/\cos(x)$  using Taylor series approximation. Compare your result with the built-in library function. Print both the results with appropriate inferences.
- 8 Sort the given set of N numbers using Bubble sort.
- 9 Write functions to implement string operations such as compare, concatenate, and find string length. Use the parameter passing techniques.
- 10 Implement structures to read, write and compute average- marks of the students, list the students scoring above and below the average marks for a class of N students.
- 11 Develop a program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of N real numbers.
12. Write a C program to copy a text file to another, read both the input file name and target file name.

Note:

SEE marks for the practical course is 50 Marks.



SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the University

All laboratory experiments are to be included for practical examination.

(Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. OR based on the course requirement evaluation rubrics shall be decided jointly by examiners.

Students can pick one question (experiment) from the questions lot prepared by the internal /external examiners jointly.

Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.

General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)

Students can pick one experiment from the questions lot with equal choice to all the students in a batch. Student should develop an algorithm, program, execute and demonstrate the results with appropriate output for the given problem.

Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

**The duration of SEE is 02 hours**

#### **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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

#### **Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

#### **CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totaling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 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 **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the

continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.

- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (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:**

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

1. The question paper will have ten questions. Each question is set for 20 marks. Marks scored shall be proportionally reduced to 50 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.
3. The students have to answer 5 full questions, selecting one full question from each module

#### **Suggested Learning Resources:**

##### **Textbooks**

1. Computer fundamentals and programming in c, "Reema Thareja", Oxford University, Second edition, 2017.

##### **Reference Books:**

1. E. Balaguruswamy, Programming in ANSI C, 7th Edition, Tata McGraw-Hill.
2. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India.

##### **Web links and Video Lectures (e-Resources):**

1. [elearning.vtu.ac.in/econtent/courses/video/BS/15PCD23.html](http://elearning.vtu.ac.in/econtent/courses/video/BS/15PCD23.html)
2. <https://nptel.ac.in/courses/106/105/106105171/> MOOC courses can be adopted for more clarity in understanding the topics and verities of problem solving methods.



3. <https://tinyurl.com/4xmrexxr>

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

- Quizzes
- Assignments
- Seminars



**H.O.D**

**Dept. of Computer Science and Design**  
**Alva's Institute of Engg. & Technology**  
**Mijar, Moodubidire - 574 225**

Course Title:	Computer Aided Engineering Drawing (Common to All)		
Course Code	BCEDK203/203	CIE Marks	50
Teaching Hour/Week (L:T:P:S)	2:0:2:0	SEE Marks	50
Total Hours of Teaching - Learning	40	Total Marks	100
Credits	03	Exam Hours	03
<b>Course Learning Objectives:</b> <b>CLO1:</b> To understand the basic principles and conventions of engineering drawing <b>CLO2:</b> To use drawing as a communication mode <b>CLO3:</b> To generate pictorial views using CAD software <b>CLO4:</b> To understand the development of surfaces <b>CLO5:</b> To visualize engineering components			
<b>Teaching-Learning (General Instructions):</b> <ul style="list-style-type: none"> <li>Students should be made aware of powerful engineering communication tool –Drawing.</li> <li>Simple Case studies can be suitably selected by the teacher for hands on practice to induce the feel of fruitfulness of learning.</li> <li>Appropriate Models, Power Point presentation, Charts, Videos, shall be used to enhance visualization before hands on practice.</li> <li>For application problems use very generally available actual objects. (Example: For rectangular prism / object; matchbox, carton boxes, book, etc can be used. Similarly for others shapes)</li> <li>Use any CAD software for generating orthographic and pictorial views.</li> <li>Make use of sketch book with graph sheets for manual / preparatory sketching</li> </ul>			
<b>Module-1</b>			
<b>Introduction: for CIE only</b> Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales. Introduction to Computer Aided Drafting software, Co-ordinate system and reference planes HP, VP, RPP & LPP of 2D/3D environment. Selection of drawing sheet size and scale. Commands and creation of Lines, coordinate points, axes, polylines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet and curves.			
<b>Orthographic Projections of Points, Lines and Planes:</b> Introduction to Orthographic projections: Orthographic projections of points in 1 <sup>st</sup> and 3 <sup>rd</sup> quadrants. Orthographic projections of lines (Placed in First quadrant only). Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon, and circular laminae (Placed in First quadrant only using change of position method). <i>Application on projections of Lines &amp; Planes (For CIE only)</i>			
<b>Module-2</b>			
<b>Orthographic Projection of Solids:</b> Orthographic projection of right regular solids ( <b>Solids Resting on HP only</b> ): Prisms & Pyramids (triangle, square, rectangle, pentagon, hexagon), Cylinders, Cones, Cubes & Tetrahedron. <i>Projections of Frustum of cone and pyramids (For practice only, not for CIE and SEE).</i>			



Module-3
<b>Isometric Projections:</b> Isometric scale, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones and spheres. Isometric projection of combination of two simple solids. <b>Conversion of simple isometric drawings into orthographic views.</b> Problems on applications of Isometric projections of simple objects / engineering components. <i>Introduction to drawing views using 3D environment (For CIE only).</i>
Module-4
<b>Development of Lateral Surfaces of Solids:</b> Development of lateral surfaces of right regular prisms, cylinders, pyramids and cones resting with base on HP only. Development of lateral surfaces of their frustums and truncations. Problems on applications of development of lateral surfaces like funnels and trays. <i>Problems on applications of development of lateral surfaces of transition pieces connecting circular duct and rectangular duct (For CIE Only)</i>
Module-5
<b>Multidisciplinary Applications &amp; Practice (For CIE Only):</b> <b>Free hand Sketching;</b> True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc <b>Drawing Simple Mechanisms;</b> Bicycles, Tricycles, Gear trains, Ratchets, two-wheeler cart & Four-wheeler carts to dimensions etc <b>Electric Wiring and lighting diagrams;</b> Like, Automatic fire alarm, Call bell system, UPS system, Basic power distribution system using suitable software <b>Basic Building Drawing;</b> Like, Architectural floor plan, basic foundation drawing, steel structures- Frames, bridges, trusses using Auto CAD or suitable software, <b>Electronics Engineering Drawings-</b> Like, Simple Electronics Circuit Drawings, practice on layers concept. <b>Graphs &amp; Charts:</b> Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.
<b>Course Outcomes</b> At the end of the course the student will be able to: <ul style="list-style-type: none"> <li><b>CO 1.</b> Draw and communicate the objects with definite shape and dimensions</li> <li><b>CO 2.</b> Recognize and Draw the shape and size of objects through different views</li> <li><b>CO 3.</b> Develop the lateral surfaces of the object</li> <li><b>CO 4.</b> Create a Drawing views using CAD software.</li> <li><b>CO 5.</b> Identify the interdisciplinary engineering components or systems through its graphical representation.</li> </ul>





Module	Max. Marks Weightage	Evaluation Weightage in marks	
		Computer display and print out (a)	Preparatory sketching (b)
Module 1	20	15	05
Module 2	30	25	05
Module 3	25	20	05
Module 4	25	20	05
<b>Total</b>	<b>100</b>	<b>80</b>	<b>20</b>
<b>Consideration of SEE Marks</b>		<b>Total of (a) + (b) ÷ 2 = Final SEE marks</b>	

### Suggested Learning Resources:

#### Text Books

- S.N. Lal, & T Madhusudhan.: Engineering Visulisation, 1<sup>st</sup> Edition, Cengage,Publication
- Parthasarathy N. S., Vela Murali, Engineering Drawing, Oxford University Press,2015.

#### Reference Books

- Bhattacharya S. K., Electrical Engineering Drawing, New Age International publishers, second edition 1998, reprint2005.
- Chris Schroder, Printed Circuit Board Design using AutoCAD, Newnes,1997.
- K S Sai Ram Design of steel structures, , Third Edition byPearson
- Nainan p kurian Design of foundation systems, Narosapublications
- A S Pabla, Electrical power distribution, 6th edition, Tata Mcgrawhill
- Bhatt, N.D., Engineering Drawing: Plane and Solid Geometry, 53<sup>rd</sup> edition, Charotar Publishing House Pvt. Limited, 2019.
- K. R. Gopalakrishna, & Sudhir Gopalakrishna: Textbook Of Computer Aided Engineering Drawing, 39<sup>th</sup> Edition, Subash Stores, Bangalore,2017

### COs and POs Mapping (CO-PO mappings are only Indicative)

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C01	3	2			3	1		1	1	3		2
C02	3	2			3	1		1	1	3		2
C03	3	2			3	1		1	1	3		2
C04	3	3			3	1	1		1	3		1
C05	3	2			3				1	3		2

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



**H.O.D**  
**Dept. of Computer Science and Design**  
**Alva's Institute of Engg. & Technology**  
**Mijar, Moodubidire - 574 225**

**Communicative English**

Course Title:	Communicative English		
Course Code:	BENGK106-206	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01
<b>Course objectives:</b> The course Communicative English (22ENG16) will enable the students, <ol style="list-style-type: none"><li>1. To know about Fundamentals of Communicative English and Communication Skills in general.</li><li>2. To train to identify the nuances of phonetics, intonation and enhance pronunciation skills for better Communication skills.</li><li>3. To impart basic English grammar and essentials of important language skills.</li><li>4. To enhance with English vocabulary and language proficiency for better communication skills.</li><li>5. To learn about Techniques of Information Transfer through presentation.</li></ol>			
<b>Teaching-Learning Process :</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective: Teachers shall adopt suitable pedagogy for effective teaching - learning process. The pedagogy shall involve the combination of different methodologies which suit modern technological tools and software's to meet the present requirements of the Global employment market. <ol style="list-style-type: none"><li>(i) Direct instructional method ( Low/Old Technology),</li><li>(ii) Flipped classrooms (High/advanced Technological tools),</li><li>(iii) Blended learning (Combination of both),</li><li>(iv) Enquiry and evaluation based learning,</li><li>(v) Personalized learning,</li><li>(vi) Problems based learning through discussion,</li><li>(vii) Following the method of expeditionary learning Tools and techniques,</li><li>(viii) Use of audio visual methods through language Labs in teaching of LSRW skills.</li></ol> 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 In theoretical applied and practical skills in teaching of communicative skills in general.			
<b>Language Lab :</b> To augment LSRW, grammar and Vocabulary skills (Listening, Speaking, Reading, Writing and Grammar, Vocabulary) through tests, activities, exercises etc., comprehensive web-based learning and assessment systems can be referred as per the AICTE / VTU guidelines.			
<b>Module-1</b>		<b>(03 hours of pedagogy)</b>	
<b>Introduction to Communicative English :</b> 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.			
<b>Module-2</b>		<b>(03 hours of pedagogy)</b>	
<b>Introduction to Phonetics :</b> 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.			
<b>Module-3</b>		<b>(03 hours of pedagogy)</b>	
<b>Basic English Communicative Grammar and Vocabulary PART - I :</b> 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.			
<b>Module-4</b>		<b>(03 hours of pedagogy)</b>	
<b>Basic English Communicative Grammar and Vocabulary PART - II:</b> 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.			
<b>Module-5</b>		<b>(03 hours of pedagogy)</b>	
<b>Communication Skills for Employment :</b> 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.			



**Course outcome (Course Skill Set)**

At the end of the course Communicative English (22ENG16) the student will be able to:

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

**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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):****Two Unit Tests each of 30 Marks (duration 01 hour)**

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus

One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration

**Two assignments each of 20 Marks**

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others.. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

**Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the **question paper is MCQ** (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE.

**Suggested Learning Resources:****Textbook:**

- 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.

**Reference Books:**

1. **Technical Communication** by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.
2. **English for Engineers** by N.P.Sudharshana and C.Savitha, Cambridge University Press – 2018.
3. **English Language Communication Skills – Lab Manual cum Workbook**, Cengage learning India Pvt Limited [Latest Revised Edition] – (ISBN-978-93-86668-45-5), 2019.
4. **A Course in Technical English – D Praveen Sam, KN Shoba**, Cambridge University Press – 2020.
5. **Practical English Usage** by Michael Swan, Oxford University Press – 2016.

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

- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions, Seminars and assignments



## Professional Writing Skills in English

Course Title:	Professional Writing Skills in English		
Course Code:	BPWSK206-106	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01
<b>Course objectives:</b> The course Professional Writing Skills in English (22PWS26) will enable the students, <ol style="list-style-type: none"><li>1. To Identify the Common Errors in Writing and Speaking of English.</li><li>2. To Achieve better Technical writing and Presentation skills for employment.</li><li>3. To read Technical proposals properly and make them to write good technical reports.</li><li>4. To Acquire Employment and Workplace communication skills.</li><li>5. To learn about Techniques of Information Transfer through presentation in different level.</li></ol>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective: Teachers shall adopt suitable pedagogy for effective teaching - learning process. The pedagogy shall involve the combination of different methodologies which suit modern technological tools and software's to meet the present requirements of the Global employment market. <ol style="list-style-type: none"><li>(i) Direct instructional method ( Low/Old Technology),</li><li>(ii) Flipped classrooms (High/advanced Technological tools),</li><li>(iii) Blended learning (Combination of both),</li><li>(iv) Enquiry and evaluation based learning,</li><li>(v) Personalized learning,</li><li>(vi) Problems based learning through discussion,</li><li>(vii) Following the method of expeditionary learning</li><li>(viii) Use of audio visual methods through language Labs in teaching of of LSRW skills.</li></ol> 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 In theoretical applied and practical skills in teaching of communicative skills in general.			
<b>Language Lab :</b> To augment LSRW, grammar and Vocabulary skills (Listening, Speaking, Reading, Writing and Grammar, Vocabulary) through tests, activities, exercises etc., comprehensive web-based learning and assessment systems can be referred as per the AICTE / VTU guidelines.			
<b>Module-1</b>		<b>(03 hours of pedagogy)</b>	
<b>Identifying Common Errors in Writing and Speaking English :</b> 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.			
<b>Module-2</b>		<b>(03 hours of pedagogy)</b>	
<b>Nature and Style of sensible writing: Organizing</b> 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.			
<b>Module-3</b>		<b>(03 hours of pedagogy)</b>	
<b>Technical Reading and Writing Practices:</b> 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.			
<b>Module-4</b>		<b>(03 hours of pedagogy)</b>	
<b>Professional Communication for Employment:</b> 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.			
<b>Module-5</b>		<b>(03 hours of pedagogy)</b>	
<b>Professional Communication at Workplace:</b> 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.			

**Course outcome (Course Skill Set)**

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

CO1	To understand and identify the Common Errors in Writing and Speaking
CO2	To Achieve better Technical writing and Presentation skills.
CO3	To read Technical proposals properly and make them to Write good technical reports.
CO4	Acquire Employment and Workplace communication skills.
CO5	To learn about Techniques of Information Transfer through presentation in different level.

**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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):****Two Unit Tests each of 30 Marks (duration 01 hour)**

- First test after the completion of 30-40 % of the syllabus
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One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration

**Two assignments each of 20 Marks**

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**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

**Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the **question paper is MCQ** (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE.

**Suggested Learning Resources:****Textbook:**

- 1) "Professional Writing Skills in English" published by Phillip Learning – Education (I.S.), 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].

**Reference Books:**

- 1) **English for Engineers** by N.P.Sudharshana and C.Savitha, Cambridge University Press – 2018.
- 2) **Technical Communication** by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4). Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.
- 3) **Technical Communication – Principles and Practice**, Third Edition by Meenakshi Raman and Sangeetha Sharma, Oxford University Press 2017.
- 4) **High School English Grammar & Composition** by Wren and Martin, S Chandh & Company Ltd – 2015.
- 5) **Effective Technical Communication – Second Edition** by M Ashraf Rizvi, McGraw Hill Education (India) Private

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

- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions, Seminars and assignments



REPORT OF THE COMMISSIONER OF THE GENERAL LAND OFFICE

14. Explain the difference between a primary and a secondary cell.
15. Explain the difference between a primary and a secondary cell.
16. Explain the difference between a primary and a secondary cell.
17. Explain the difference between a primary and a secondary cell.
18. Explain the difference between a primary and a secondary cell.

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1. What is the main purpose of the study?  
 2. What are the research objectives?  
 3. What is the scope of the study?  
 4. What are the limitations of the study?  
 5. What are the key findings of the study?  
 6. What are the conclusions of the study?  
 7. What are the implications of the study?  
 8. What are the recommendations of the study?  
 9. What are the future research directions?  
 10. What are the references of the study?

CONFIDENTIAL - INTERNAL SECURITY

~~CONFIDENTIAL - SECURITY INFORMATION (UNCLASSIFIED)~~

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~~CONFIDENTIAL~~

The first step in the process of the investigation is to identify the problem. This is done by gathering information about the situation and the people involved. The next step is to analyze the information and determine the cause of the problem. This is done by looking at the data and identifying patterns. The third step is to develop a plan to solve the problem. This is done by brainstorming ideas and choosing the best one. The fourth step is to implement the plan. This is done by putting the plan into action. The fifth step is to evaluate the results. This is done by looking at the data and seeing if the problem has been solved.

For more information, visit [www.pearsoncmg.com](http://www.pearsoncmg.com) or call 1-800-818-7243.

DATE OF EXAMINATION: \_\_\_\_\_

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### ADDITIONAL READING RESOURCES

STUDY

- ~~Professional Writing Skills English~~
- ~~Functional English~~
- ~~Self-Reflection Paper~~

Robertson, 1996

1. ~~Establish a program of continuous improvement.~~
2. ~~Establish a program of continuous improvement.~~
3. ~~Establish a program of continuous improvement.~~
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10. ~~Establish a program of continuous improvement.~~

WORLD TRADE CENTER, INVESTMENT GROUP, INC. (NY) PARTIAL RECALL

1. What is the purpose of the study?  
2. What are the research objectives?  
3. What is the research methodology?  
4. What are the results of the study?



### ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ - ಕನ್ನಡ ಬಲ್ಲ ಮತ್ತು ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಕ್ರಮ

Course Title:	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ		
Course Code:			
Course Type (Theory/Practical /Integrated)	BKSKK107-207	CIE Marks	50
		SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

**Course objectives :** ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:

The course (22KSK17/27) will enable the students.

1. ವ್ಯಕ್ತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸುವುದು.
3. ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
4. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
5. ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

### ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವ್ಯವಸ್ಥೆ (Teaching-Learning Process - General Instructions) :

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

1. ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಬೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ತಕ ಆಧಾರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.
2. ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು - ಅಂದರೆ ಕವಿ-ಕಾವ್ಯ ಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪ್ಪಣಿ, ಡಿಜಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು.
3. ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಬೋಧನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.

### ಘಟಕ -1 ಕನ್ನಡ ಸಂಸ್ಕೃತಿ ಮತ್ತು ಭಾಷೆ ಕುರಿತಾದ ಲೇಖನಗಳು (03 hours of pedagogy)

1. ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ - ಹಂಪ ನಾಗರಾಜಯ್ಯ
2. ಕರ್ನಾಟಕದ ಐಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ - ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯ
3. ಅಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ - ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೊ. ವಿ. ಕೇಶವಮೂರ್ತಿ

### ಘಟಕ - 2 ಆಧುನಿಕ ಪೂರ್ವದ ಕಾವ್ಯ ಭಾಗ (03 hours of pedagogy)

1. ವಚನಗಳು : ಬಸವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ.
2. ಕೀರ್ತನೆಗಳು : ಅದರಿದೇನು ಫಲ ಇದರಿದೇನು ಫಲ - ಪುರಂದರದಾಸರು  
ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೇ - ಕನಕದಾಸರು
3. ತತ್ವಪದಗಳು : ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು - ಶಿಶುನಾಳ ಶರೀಫ

### ಘಟಕ -3 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ (03 hours of pedagogy)

1. ಡಿವಿಜಿ ರವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಅಯ್ಯ ಕೆಲವು ಭಾಗಗಳು
2. ಕುರುಡು ಕಾಂಚಾಣ : ದಾ.ರಾ. ಬೇಂದ್ರೆ
3. ಹೊಸಬಾಲಿನ ಗೀತೆ : ಕುವೆಂಪು

### ಘಟಕ - 4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ (03 hours of pedagogy)

1. ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ - ಎ. ಎನ್. ಮೂರ್ತಿರಾವ್
2. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ

### ಘಟಕ - 5 ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ (03 hours of pedagogy)

1. ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ
2. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ

**Course outcome (Course Skill Set)**

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ (22KSK17/27) ಪಠ್ಯ ಕಲಿಕೆಯ ನಂತರ ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ :

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

C01	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಕುರಿತು ಅರಿವು ಮೂಡಿರುತ್ತದೆ.
C02	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪುರಾಣ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಕಲಿತು ಹೆಚ್ಚಿನ ಓದಿಗೆ ಮತ್ತು ಜ್ಞಾನಕ್ಕೆ ಸ್ಪೂರ್ತಿ ಮೂಡುತ್ತದೆ.
C03	ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಹೆಚ್ಚಾಗುತ್ತದೆ.
C04	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಂಡು ನಾಡಿನ ಇನ್ನಿತರ ವ್ಯಕ್ತಿಗಳ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳಲು ಕೌತುಕ ಹೆಚ್ಚಾಗುತ್ತದೆ.
C05	ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

**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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):****Two Unit Tests each of 30 Marks (duration 01 hour)**

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus

One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration

**Two assignments each of 20 Marks**

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

**Semester End Examinations (SEE)**

SEE paper shall be set for 50 questions, each of the 01 mark. The pattern of the question paper is MCQ (multiple choice questions). The time allotted for SEE is 01 hour. The student must secure a minimum of 35% of the maximum marks for SEE.

**University Prescribed Textbook :**

**ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ**

ಡಾ. ಹಿ.ಚಿ.ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ,

ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ,

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

**ಸೂಚನೆ :**

1. ಹೆಚ್ಚಿನ ಮಾಹಿತಿ ಮತ್ತು ವಿವರಣೆಗಳಿಗೆ ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ (9900832331) ಇವರನ್ನು ಸಂಪರ್ಕಿಸಿ.
2. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ, ಕೋರ್ಸ್ ಆಯ್ಕೆ ಮಾಹಿತಿ, ಅಧ್ಯಯನ ಸಾಮಗ್ರಿ & ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳ ಕೈಪಿಡಿಗಾಗಿ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್ ಸೈಟ್ ನೋಡುವುದು.

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

- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions, Seminars and assignments.



H.O.D

Dept. of Computer Science and Design  
Aiva's Institute of Engg. & Technology  
Mijar, Moodubidre - 574 225



Theory - 01 Credit Course

**ಬಳಕೆ ಕನ್ನಡ - baLake Kannada (Kannada for Usage)****ಕನ್ನಡ ಕಲಿಕೆಗಾಗಿ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಪುಸ್ತಕ - (Prescribed Textbook to Learn Kannada)**

Course Title:	ಬಳಕೆ ಕನ್ನಡ		
Course Code:	BKBKK107-207	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

**Course objectives : ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:**

The course (22KBBK17/27) will enable the students,

1. To Create the awareness regarding the necessity of learning local language for comfortable and healthy life.
2. To enable learners to Listen and understand the Kannada language properly.
3. To speak, read and write Kannada language as per requirement.
4. To train the learners for correct and polite conversation.
5. To know about Karnataka state and its language, literature and General information about this state.

**ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವ್ಯವಸ್ಥೆ (Teaching-Learning Process - General Instructions) :**

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

1. ಬಳಕೆ ಕನ್ನಡವನ್ನು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಬೋಧಿಸಲು ವಿಟಿಯು ಸೂಚಿಸಿರುವ ಪಠ್ಯಪುಸ್ತಕವನ್ನು ಉಪಯೋಗಿಸಬೇಕು.
2. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಉತ್ತೇಜಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.
3. ಪ್ರತಿ ವಿದ್ಯಾರ್ಥಿ ಪುಸ್ತಕವನ್ನು ತರಗತಿಯಲ್ಲಿ ಬಳಸುವಂತೆ ನೋಡಿಕೊಳ್ಳುವುದು ಮತ್ತು ಪ್ರತಿ ಪಾಠ ಮತ್ತು ಪ್ರವಚನಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಪೂರಕ ಚಟುವಟಿಕೆಗಳಿಗೆ ತೊಡಗಿಸತಕ್ಕದ್ದು.
4. ಡಿಜಿಟಲ್ ತಂತ್ರಜ್ಞಾನದ ಮುಖಾಂತರ ಇತ್ತೀಚೆಗೆ ಡಿಜಿಟಲೀಕರಣ ಗೊಂಡಿರುವ ಭಾಷೆ ಕಲಿಕೆಯ ವಿಧಾನಗಳನ್ನು ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ಮುಖಾಂತರ ಚರ್ಚಿಸಲು ಕ್ರಮಕೈಗೊಳ್ಳುವುದು. ಇದರಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ತರಗತಿಯಲ್ಲಿ ಹೆಚ್ಚು ಏಕಾಗ್ರತೆಯಿಂದ ಪಾಠ ಕೇಳಲು ಮತ್ತು ಅಧ್ಯಯನದಲ್ಲಿ ತೊಡಗಲು ಅನುಕೂಲವಾಗುತ್ತದೆ.
5. ಭಾಷಾಕಲಿಕೆಯ ಪ್ರಯೋಗಾಲಯದ ಮುಖಾಂತರ ಬಹುಬೇಗ ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಕಲಿಯಲು ಅನುಕೂಲವಾಗುವಂತೆ ಕಾರ್ಯಚಟುವಟಿಕೆಗಳನ್ನು ಮತ್ತು ಕ್ರಿಯಾ ಯೋಜನೆಗಳನ್ನು ರೂಪಿಸುವುದು.

**Module - 1**

(03 hours of pedagogy)

1. Introduction, Necessity of learning a local language. Methods to learn the Kannada language.
2. Easy learning of a Kannada Language: A few tips. Hints for correct and polite conversation, Listening and Speaking Activities, Key to Transcription
3. ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ/ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು - Personal Pronouns, Possessive Forms, Interrogative words



**Module - 2**

(03 hours of pedagogy)

1. ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು - Possessive forms of nouns, dubitive question and Relative nouns
2. ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ, ನಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative, Quantitative and Colour Adjectives, Numerals
3. ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು -ಸಪ್ರಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ, ಆಮೆ, ಆಪು, ಆಶ್ಚಿ) - Predictive Forms, Locative Case

**Module - 3**

(03 hours of pedagogy)

1. ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು - Dative Cases, and Numerals
2. ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು -Ordinal numerals and Plural markers
3. ನ್ಯೂನ/ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು & ವರ್ಣ ಗುಣವಾಚಕಗಳು -Defective/Negative Verbs & Colour Adjectives

**Module- 4**

(03 hours of pedagogy)

1. ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತ್ತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು  
Permission, Commands, encouraging and Urging words (Imperative words and sentences)
2. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು  
Accusative Cases and Potential Forms used in General Communication
3. "ಇರು ಮತ್ತು ಇರಲ್ಲ" ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು -  
Helping Verbs "iru and iralla", Corresponding Future and Negation Verbs
4. ಹೋಲಿಕೆ (ತರತಮ), ಸಂಬಂಧ ಸೂಚಕ, ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ-  
Comparative, Relationship, Identification and Negation Words

**Module - 5**

(03 hours of pedagogy)

1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು -Different types of Tense, Time and Verbs
2. ದ್, -ತ್, - ತು, - ಇತು, - ಆಗಿ, - ಅಲ್ಲ, - ಗ್, -ಕ್, ಇದ, ಕ್ರಿಯಾ ಪ್ರತ್ಯಯಗಳೊಂದಿಗೆ ಭೂತ, ಭವಿಷ್ಯತ್ ಮತ್ತು  
ವರ್ತಮಾನ ಕಾಲ ವಾಕ್ಯ ರಚನೆ - Formation of Past, Future and Present Tense Sentences with Verb Forms
3. Kannada Vocabulary List :ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು -Kannada Words in Conversation

**Course outcome (Course Skill Set)**

ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಅನುಕೂಲಗಳು ಮತ್ತು ಫಲಿತಾಂಶಗಳು:

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

C01	To understand the necessity of learning of local language for comfortable life.
C02	To speak, read and write Kannada language as per requirement.
C03	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C04	To Listen and understand the Kannada language properly.
C05	To speak in polite conversation.

**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

26.10.2022

35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):**

**Two Unit Tests each of 30 Marks (duration 01 hour)**

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus

One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration

**Two assignments each of 20 Marks**

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others.. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

**Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the **question paper is MCQ** (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE.

**University Prescribed Textbook :**

**ಬಳಕೆ ಕನ್ನಡ**

**ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ**

**ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ,**

**ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.**

**ಸೂಚನೆ :**

1. ಹೆಚ್ಚಿನ ಮಾಹಿತಿ ಮತ್ತು ವಿವರಣೆಗಳಿಗೆ ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ (9900832331) ಇವರನ್ನು ಸಂಪರ್ಕಿಸಿ.
2. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ, ಕೋರ್ಸ್ ಆಯ್ಕೆ ಮಾಹಿತಿ, ಅಧ್ಯಯನ ಸಾಮಗ್ರಿ & ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳ ಕೈಪಿಡಿಗಾಗಿ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್ ಸೈಟ್ ನೋಡುವುದು.

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

- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions,
- ✓ Seminars and assignments

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**Theory - 01 Credit Course**  
**Indian Constitution**

BICOK107-207

Course Title:	Indian Constitution		
Course Code:		CIE Marks	50
Course Type (Theory/Practical /Integrated)	BICOK107-207	SEE Marks	50
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Total Marks	100
Total Hours of Pedagogy	15 hours	Exam Hours	01 Theory
		Credits	01

**Course objectives :**

The course **INDIAN CONSTITUTION (22IC017 / 27)** will enable the students,

1. To know about the basic structure of Indian Constitution.
2. To know the Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.
3. To know about our Union Government, political structure & codes, procedures.
4. To know the State Executive & Elections system of India.
5. To learn the Amendments and Emergency Provisions, other important provisions given by the constitution.

**Teaching-Learning Process**

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching - Learning more effective: Teachers shall adopt suitable pedagogy for effective teaching - learning process. The pedagogy shall involve the combination of different methodologies which suit modern technological tools.

- (i) Direct instructional method ( Low/Old Technology), (ii) Flipped classrooms (High/advanced Technological tools), (iii) Blended learning (Combination of both), (iv) Enquiry and evaluation based learning, (v) Personalized learning, (vi) Problems based learning through discussion.
- (vi) 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 In theoretical applied and practical skills.

**Module-1 (03 hours of pedagogy)**

Indian Constitution: Necessity of the Constitution, Societies before and after the Constitution adoption. Introduction to the Indian constitution, Making of the Constitution, Role of the Constituent Assembly.

**Module-2 (03 hours of pedagogy)**

Salient features of India Constitution. Preamble of Indian Constitution & Key concepts of the Preamble. Fundamental Rights (FR's) and its Restriction and limitations in different Complex Situations. building.

**Module-3 (03 hours of pedagogy)**

Directive Principles of State Policy (DPSP's) and its present relevance in Indian society. Fundamental Duties and its Scope and significance in Nation, Union Executive : Parliamentary System, Union Executive – President, Prime Minister, Union Cabinet.

**Module-4 (03 hours of pedagogy)**

Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Judicial System of India, Supreme Court of India and other Courts, Judicial Reviews and Judicial Activism.

**Module-5 (03 hours of pedagogy)**

State Executive and Governor, CM, State Cabinet, Legislature - VS & VP, Election Commission, Elections & Electoral Process. Amendment to Constitution, and Important Constitutional Amendments till today. Emergency Provisions.

**Course outcome (Course Skill Set)**

At the end of the course 22IC017/27 the student will be able to:

C01	Analyse the basic structure of Indian Constitution.
C02	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
C03	know about our Union Government, political structure & codes, procedures.
C04	Understand our State Executive & Elections system of India.
C05	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.



**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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):****Two Unit Tests each of 30 Marks (duration 01 hour)**

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus

One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration

**Two assignments each of 20 Marks**

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others.. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

**Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the **question paper is MCQ** (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE.

**Suggested Learning Resources:****Textbook:**

1. **"Constitution of India" (for Competitive Exams)** - Published by Naidhruva Edutech Learning Solutions, Bengaluru. – 2022.
2. **"Introduction to the Constitution of India"**, (Students Edition.) by Durga Das Basu (**DD Basu**): Prentice –Hall, 2008.

**Reference Books:**

1. **"Constitution of India, Professional Ethics and Human Rights"** by Shubham Singles, Charles E. Haries, and et al: published by Cengage Learning India, Latest Edition – 2019.
2. **"The Constitution of India"** by Merunandan K B: published by Merugu Publication, Second Edition, Bengaluru.
3. **"Samvidhana Odu" - for Students & Youths by Justice HN Nagamohan Dhas, Sahayana, kerekon.**
4. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics"**, Prentice –Hall, 2004.

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

- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions
- ✓ Seminars and assignments

**I Semester**

<b>INNOVATION and DESIGN THINKING</b>			
Course Code	<b>BIDTK158/258</b>	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	1:0:0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	01

**Course Category:** Foundation

**Preamble:** This course provides an introduction to the basic concepts and techniques of engineering and reverses engineering, the process of design, analytical thinking and ideas, basics and development of engineering drawing, application of engineering drawing with computer aide.

**Course objectives:**

- To explain the concept of design thinking for product and service development
- To explain the fundamental concept of innovation and design thinking
- To discuss the methods of implementing design thinking in the real world.

**Teaching-Learning Process (General Instructions)**

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

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

**Module-1**

**PROCESS OF DESIGN**

**Understanding Design thinking**

Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping

<b>Teaching-Learning Process</b>	Introduction about the design thinking: Chalk and Talk method Theory and practice through presentation MVP and Prototyping through live examples and videos
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**Module-2**

**Tools for Design Thinking**

Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space – Empathy for design – Collaboration in distributed Design

<b>Teaching-Learning</b>	Case studies on design thinking for real-time interaction and analysis
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Process	Simulation exercises for collaborated enabled design thinking Live examples on the success of collaborated design thinking	
Module-3		
Design Thinking in IT Design Thinking to Business Process modelling – Agile in Virtual collaboration environment – Scenario based Prototyping		
Teaching-Learning Process	Case studies on design thinking and business acceptance of the design Simulation on the role of virtual eco-system for collaborated prototyping	
Module-4		
DT For strategic innovations Growth – Story telling representation – Strategic Foresight - Change – Sense Making - Maintenance Relevance – Value redefinition - Extreme Competition – experience design - Standardization – Humanization - Creative Culture – Rapid prototyping, Strategy and Organization – Business Model design.		
Teaching-Learning Process	Business model examples of successful designs Presentation by the students on the success of design Live project on design thinking in a group of 4 students	
Module-5		
Design thinking workshop Design Thinking Work shop Empathize, Design, Ideate, Prototype and Test		
Teaching-Learning Process	8 hours design thinking workshop from the expect and then presentation by the students on the learning from the workshop	
Course Outcomes: Upon the successful completion of the course, students will be able to:		
CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
C01	Appreciate various design process procedure	K2
C02	Generate and develop design ideas through different technique	K2
C03	Identify the significance of reverse Engineering to Understand products	K2
C04	Draw technical drawing for design ideas	K3

### 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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

#### Continuous Internal Evaluation (CIE):

- Two Tests (preferably in MCQ pattern ) each of **30 Marks**; The first test after the completion of the 40 -50% syllabus of the course. A second test after the completion of 90-100% of the syllabus of the course.
- Two Assignments/two quizzes/two seminars/one field survey and report presentation/one-course project totaling **40 marks**

Total Marks scored (test + assignments) out of 100 shall be scaled down to **50 marks**

At the beginning of the semester, the instructor/faculty teaching the course has to announce the methods of CIE for the course.

The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

#### Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for subject

SEE paper will be set for 50 questions of each of 01 marks. The pattern of the question paper is MCQ. The time allotted for SEE is **01 hour**

#### Suggested Learning Resources:

##### Text Books :

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. Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011
4. Idris Mootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.

#### References:



5. Yousef Haik and Tamer M. Shahin, "Engineering Design Process", Cengage Learning, Second Edition, 2011.
6. Book - Solving Problems with Design Thinking - Ten Stories of What Works (Columbia Business School Publishing) Hardcover – 20 Sep 2013 by Jeanne Liedtka (Author), Andrew King (Author), Kevin Bennett (Author).

**Web links and Video Lectures (e-Resources):**

1. [www.tutor2u.net/business/presentations/. /productlifecycle/default.html](http://www.tutor2u.net/business/presentations/. /productlifecycle/default.html)
2. [https://docs.oracle.com/cd/E11108\\_02/otn/pdf/. /E11087\\_01.pdf](https://docs.oracle.com/cd/E11108_02/otn/pdf/. /E11087_01.pdf)
3. [www.bizfilings.com](http://www.bizfilings.com) › Home › Marketing › Product Development
4. <https://www.mindtools.com/brainstm.html>
5. <https://www.quicksprout.com/. /how-to-reverse-engineer-your-competit>
6. [www.vertabelo.com/blog/documentation/reverse-engineering](http://www.vertabelo.com/blog/documentation/reverse-engineering)  
<https://support.microsoft.com/en-us/kb/273814>
7. <https://support.google.com/docs/answer/179740?hl=en>
8. <https://www.youtube.com/watch?v=2mjSDIBaUIM>  
[thevirtualinstructor.com/foreshortening.html](http://thevirtualinstructor.com/foreshortening.html)  
<https://dschool.stanford.edu/.../designresources/.../ModeGuideBOOTCAMP2010L.pdf>  
<https://dschool.stanford.edu/use-our-methods/> 6. <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process> 7.  
<http://www.creativityatwork.com/design-thinking-strategy-for-innovation/> 49 8.  
<https://www.nngroup.com/articles/design-thinking/> 9.  
<https://designthinkingforeducators.com/design-thinking/> 10.  
[www.designthinkingformobility.org/wp-content/.../10/NapkinPitch\\_Worksheet.pdf](http://www.designthinkingformobility.org/wp-content/.../10/NapkinPitch_Worksheet.pdf)

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

- <http://dschool.stanford.edu/dgift/>

[https://onlinecourses.nptel.ac.in/noc19\\_mg60/preview](https://onlinecourses.nptel.ac.in/noc19_mg60/preview)

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**Scientific Foundations of Health**

Course Title:	Scientific Foundations of Health		
Course Code:	BSFHK158/258	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

**Course objectives**

The course Scientific Foundations of Health (22SFH18/28) will enable the students,

1. To know about Health and wellness (and its Beliefs) & It's balance for positive mindset.
2. To Build the healthy lifestyles for good health for their better future.
3. To Create a Healthy and caring relationships to meet the requirements of good/social/positive life.
4. To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
5. To Prevent and fight against harmful diseases for good health through positive mindset

**Teaching-Learning Process**

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching -Learning more effective:

Teachers shall adopt suitable pedagogy for effective teaching - learning process. The pedagogy shall involve the combination of different methodologies which suit modern technological tools.

- (i) Direct instructional method ( Low/Old Technology), (ii) Flipped classrooms (High/advanced Technological tools),
- (iii) Blended learning (Combination of both), (iv) Enquiry and evaluation based learning,
- (v) Personalized learning, (vi) Problems based learning through discussion, (vii) Following the method of expeditionary learning Tools and techniques, (viii) Use of audio visual methods.

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 In theoretical applied and practical skills.

**Module-1****(03 hours of pedagogy)**

**Good Health & It's balance for positive mindset:** Health -Importance of Health, Influencing factors of Health, Health beliefs, Advantages of good health, Health & Behavior, Health & Society, Health & family, Health & Personality, Psychological disorders-Methods to improve good psychological health, Changing health habits for good health.

**Module-2****(03 hours of pedagogy)**

**Building of healthy lifestyles for better future:** Developing healthy diet for good health, Food & health, Nutritional guidelines for good health, Obesity & overweight disorders and its management, Eating disorders, Fitness components for health, Wellness and physical function, How to avoid exercise injuries

**Module-3****(03 hours of pedagogy)**

**Creation of Healthy and caring relationships :** Building communication skills, Friends and friendship - Education, the value of relationship and communication skills, Relationships for Better or worsening of life, understanding of basic instincts of life (more than a biology), Changing health behaviours through social engineering.

**Module-4****(03 hours of pedagogy)**

**Avoiding risks and harmful habits :** Characteristics of health compromising behaviors, Recognizing and avoiding of addictions, How addiction develops, Types of addictions, influencing factors of addictions, Differences between addictive people and non addictive people & their behaviors. Effects of addictions Such as...., how to recovery from addictions.

**Module-5****(03 hours of pedagogy)**

**Preventing & fighting against diseases for good health:** How to protect from different types of infections, How to reduce risks for good health, Reducing risks & coping with chronic conditions, Management of chronic illness for Quality of life, Health & Wellness of youth :a challenge for upcoming future, Measuring of health & wealth status.

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**Course outcome (Course Skill Set) :**

At the end of the course Scientific Foundations of Health (22SFH18/28) the student will be able to:

CO1	To understand and analyse about Health and wellness (and its Beliefs) & Its balance for positive mindset.
CO2	Develop the healthy lifestyles for good health for their better future.
CO3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
CO4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future.
CO5	Prevent and fight against harmful diseases for good health through positive mindset.

**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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE) :****Two Unit Tests each of 30 Marks (duration 01 hour)**

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus

One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration.

**Two assignments each of 20 Marks**

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others.. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

**Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the **question paper is MCQ** (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE.

**Suggested Learning Resources:****Textbook:**


1. "Scientific Foundations of Health" – Study Material Prepared by Dr. L Thimmesha, Published in VTU - University Website.
2. "Scientific Foundations of Health", (ISBN-978-81-955465-6-5) published by Infinite Learning Solutions, Bangalore – 2022.
3. **Health Psychology - A Textbook**, FOURTH EDITION by Jane Ogden McGraw Hill Education (India) Private Limited - Open University Press.

**Reference Books:**

1. **Health Psychology** (Second edition) by Charles Abraham, Mark Conner, Fiona Jones and Daryl O'Connor – Published by Routledge 711 Third Avenue, New York, NY 10017.
2. **HEALTH PSYCHOLOGY (Ninth Edition)** by SHELLEY E. TAYLOR - University of California, Los Angeles, McGraw Hill Education (India) Private Limited - Open University Press.
3. **SWAYAM / NPTL/ MOOCS/ We blinks/ Internet sources/ YouTube videos** and other materials / notes.
4. **Scientific Foundations of Health (Health & Wellness) - General Books** published for university and colleges references by popular authors and published by the reputed publisher.

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

- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions, Seminars and assignments

  
H.O.D

Course Title:	<b>Introduction to Electronics &amp; Communication</b>		
Course Code:	BESCK104C/204C	CIE Marks	50
Course Type (Theory/Practical/Integrated )	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	3:0:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03
<b>Course objectives</b> <ol style="list-style-type: none"> <li>1. To prepare students with fundamental knowledge/ overview in the field of Electronics and Communication Engineering.</li> <li>2. To equip students with a basic foundation in electronic engineering required for comprehending the operation and application of electronic circuits, logic design, embedded systems, and communication systems.</li> <li>3. Professionalism &amp; Learning Environment: To inculcate in first-year engineering students an ethical and professional attitude by providing an academic environment inclusive of effective communication, teamwork, ability to relate engineering issues to a broader social context, and life-long learning needed for a successful professional career.</li> </ol>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective <ol style="list-style-type: none"> <li>1. Lecturer method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.</li> <li>2. Arrange visits to nearby PSUs such as BHEL, BEL, ISRO, etc., and small-scale hardware Industries to give brief information about the electronics manufacturing industry.</li> <li>3. Show Video/animation films to explain the functioning of various analog and digital circuits.</li> <li>4. Encourage collaborative (Group) Learning in the class</li> <li>5. Ask at least three HOTS (Higher-order Thinking) questions in the class, which promotes critical thinking</li> <li>6. 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.</li> <li>7. Topics will be introduced in multiple representations.</li> <li>8. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.</li> <li>9. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.</li> </ol>			
<b>Module-1 (8 hours )</b>			
<b>Power Supplies</b> –Block diagram, Half-wave rectifier, Full-wave rectifiers and filters, Voltage regulators, Output resistance and voltage regulation, Voltage multipliers. <b>Amplifiers</b> – Types of amplifiers, Gain, Input and output resistance, Frequency response, Bandwidth, Phase shift, Negative feedback, multi-stage amplifiers (Text 1)			
<b>Module-2(8 hours )</b>			



<p><b>Oscillators</b> – Barkhausen criterion, sinusoidal and non-sinusoidal oscillators, Ladder network oscillator, Wein bridge oscillator, Multivibrators, Single-stage astable oscillator, Crystal controlled oscillators (Only Concepts, working, and waveforms. No mathematical derivations)</p> <p><b>Operational amplifiers</b> -Operational amplifier parameters, Operational amplifier characteristics. Operational amplifier configurations, Operational amplifier circuits.</p> <p>Text 1)</p>
<b>Module-3 ( 8 hours)</b>
<p><b>Boolean Algebra and Logic Circuits:</b> Binary numbers, Number Base Conversion, octal &amp; Hexa Decimal Numbers, Complements, Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates (Text 2: 1.2, 1.3, 1.4, 1.5,2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7)</p> <p><b>Combinational logic:</b> Introduction, Design procedure, Adders- Half adder, Full adder (Text 2:4.1, 4.2, 4.3)</p>
<b>Module-4 ( 8 hours)</b>
<p><b>Embedded Systems</b> – Definition, Embedded systems vs general computing systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Elements of an Embedded System, Core of the Embedded System, Microprocessor vs Microcontroller, RISC vs CISC</p> <p><b>Sensors and Interfacing</b> – Instrumentation and control systems, Transducers, Sensors, Actuators, LED, 7-Segment LED Display. (Text 3)</p>
<b>Module-5 ( 8 hours)</b>
<p><b>Analog Communication Schemes</b> – Modern communication system scheme, Information source, and input transducer, Transmitter, Channel or Medium – Hardwired and Soft wired, Noise, Receiver, Multiplexing, Types of communication systems. Types of modulation (only concepts) – AM , FM, Concept of Radio wave propagation (Ground, space, sky)</p> <p><b>Digital Modulation Schemes:</b> Advantages of digital communication over analog communication, ASK, FSK, PSK, Radio signal transmission Multiple access techniques. ( Text 4)</p>

**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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation (CIE):**

Three Tests each of 20 Marks;

- 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of 40 Marks.

If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to 50 marks

**Semester End Examination(SEE):**

Theory SEE will be conducted by University 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 students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally 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.
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**Suggested Learning Resources**

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

1. Mike Tooley, "Electronic Circuits, Fundamentals & Applications", 4th Edition, Elsevier, 2015.

DOI: <https://doi.org/10.4324/9781357379901>, ISBN: 9781357379901

2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 (ISBN-978-81-203-4477-4).

3. R. V. Shrivastava, "Introduction to Embedded Systems", 2nd Edition, McGraw Hill Education (India), Private Limited, 2016.

4. S. L. Kakani and Priyanka Punglia, "Communication Systems", New Age International Publishers, 2017.

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H.O.D.

Dept. of Computer Science and Design  
Ava's Institute of Engg. & Technology  
Majra, Mohali - 151 105

Course Title:	<b>GREEN BUILDINGS</b>		
Course Code:	<b>BETCK105B/205B</b>	CIE Marks	50
Course Type (Theory/Practical /Integrated )	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	3:0:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03

**Course objectives:** This course will enable students to:

- Understand the Definition, Concept & Objectives of the terms cost effective construction and green building
- Apply cost effective techniques in construction
- 3.Apply cost effective Technologies and Methods in Construction
- Understand the Problems due to Global Warming
- State the Concept of Green Building
- Understand Green Buildings

#### **Teaching-Learning Process**

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. Arrange visits to nearby sites to give brief information about the Civil Engineering structures.
3. Show Video/animation films to explain the infrastructures and the mechanism involved in the principle.
4. Encourage collaborative (Group) Learning in the class.
5. Ask at least three HOT (Higher-order Thinking) questions in the class, which promotes critical thinking.
6. 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.
7. Topics will be introduced in multiple representations.
8. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
9. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.
10. Individual teachers can devise innovative pedagogy to improve teaching-learning.

#### **Module-1 (08)**

**Introduction to the concept of cost effective construction** -Uses of different types of materials and their availability -Stone and Laterite blocks- Burned Bricks- Concrete Blocks- Stabilized Mud Blocks- LimePozzolana Cement- Gypsum Board- Light Weight Beams- Fiber Reinforced Cement Components- Fiber Reinforced Polymer Composite- Bamboo- Availability of different materials- Recycling of building materials – Brick- Concrete- Steel- Plastics - Environmental issues related to quarrying of building materials.

#### **Module-2 (08)**



<b>Environment friendly and cost effective Building Technologies</b> - Different substitute for wall construction Flemish Bond - Rat Trap Bond – Arches – Panels - Cavity Wall - Ferro Cement and Ferro Concrete constructions – different pre cast members using these materials - Wall and Roof Panels – Beams – columns - Door and Window frames - Water tanks - Septic Tanks - Alternate roofing systems - Filler Slab - Composite Beam and Panel Roof -Pre-engineered and ready to use building elements - wood products - steel and plastic - Contributions of agencies - Costford - Nirmithi Kendra - Habitat	
<b>Module-3(08)</b>	
<b>Global Warming</b> – Definition - Causes and Effects - Contribution of Buildings towards Global Warming - Carbon Footprint – Global Efforts to reduce carbon Emissions Green Buildings – Definition - Features- Necessity – Environmental benefit - Economical benefits - Health and Social benefits - Major Energy efficient areas for buildings – Embodied Energy in Materials Green Materials - Comparison of Initial cost of Green V/s Conventional Building - Life cycle cost of Buildings.	
<b>Module-4(08)</b>	
<b>Green Building rating Systems-</b> BREEAM – LEED - GREEN STAR -GRIHA ( Green Rating for Integrated Habitat Assessment) for new buildings – Purpose - Key highlights - Point System with Differential weight age. Green Design – Definition - Principles of sustainable development in Building Design - Characteristics of Sustainable Buildings – Sustainably managed Materials - Integrated Lifecycle design of Materials and Structures (Concepts only)	
<b>Module-5 (08)</b>	
<b>Utility of Solar Energy in Buildings</b> Utility of Solar energy in buildings concepts of Solar Passive Cooling and Heating of Buildings. Low Energy Cooling. Case studies of Solar Passive Cooled and Heated Buildings.	
<b>Green Composites for Buildings</b> Concepts of Green Composites. Water Utilisation in Buildings, Low Energy Approaches to Water Management. Management of Solid Wastes. Management of Sullage Water and Sewage. Urban Environment and Green Buildings. Green Cover and Built Environment.	
<b>Course outcome (Course Skill Set)</b>	
At the end of the course the student will be able to:	
C01	Select different building materials for construction
C02	Apply effective environmental friendly building technology
C03	Analyze global warming due to different materials in construction
C04	Analyse buildings for green rating
C05	Use alternate source of energy and effective use water

**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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):**

Three Tests each of 20 Marks;

- 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of 40 Marks.

If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to 50 marks

**Semester End Examination (SEE):**

Theory SEE will be conducted by University 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 students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally 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.

**Suggested Learning Resources:****Text Books**

1. HarharaIyer G, Green Building Fundamentals, Notion Press
2. Dr. Adv. HarshulSavla, Green Building: Principles & Practices



16-2-2023

**Web links and Video Lectures (e-Resources):**

- <https://www.youtube.com/watch?v=THgQF8zHBW8>
- [https://www.youtube.com/watch?v=DRO\\_rlkyywxQ](https://www.youtube.com/watch?v=DRO_rlkyywxQ)
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**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- Students have to visit a building which is green rated and prepare a report

**COs and POs Mapping (Individual teacher has to fill up)**

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C01	2	1				1	1					
C02	2	1				1	1					
C03	2	1				1	1					
C04	2	1				1	1					
C05	2	1				1	1					

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

**Note:** Depending on the assessment tool used, higher order POs can be identified by the concerned course instructor.



H.O.D

Dept. of Computer Science and Design  
Alva's Institute of Engg. & Technology  
Mijar, Moodubidire - 574 225

Course Title	Introduction to Python Programming	Cr. Hours	03
Course Code	22BCE001	Cr. Hours	03
Course Name (Major / Minor / Elective)	Major - Core	Cr. Hours	03
Teaching Hours / Week (L: T: P: S)	2:0:0:0	Exam Hours	03
Total Hours of Lecturing	48 hours	Credits	03

#### Course Objectives

- Learn the syntax and semantics of the Python programming language.
- Illustrate the process of structuring the data using lists, tuples.
- Appraise the need for working with various documents like Excel, PDF, Word and others.
- Demonstrate the use of built-in functions to manage the file system.
- Implement the Object-Oriented Programming concepts in Python.

#### Teaching & Learning Process

There are sample strategies which teacher can use to accelerate the attainment of the various course outcomes and make teaching & learning more effective.

1. Use <https://www.python.org/doc/> in order to visualize the python code.
2. Demonstrate and visualize basic data types (list, tuple, dictionary).
3. Chalk and talk.
4. online and videos.

#### Module-1 (08 hrs)

**Python Basics:** Installing Python on the Interactive Shell, the Integer, Floating Point, and String Data Types, String Concatenation and Repetition, Storing Values in Variables, User Input Program, Processing User Program, Flow control: Decision Making, Comparison Operators, Decision Operations, Mixing Decision and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules, Ending a Program File with sys.exit(), 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, A Short Program: Guess the Number.

Textbook 1: Chapters 1 - 3

#### Module-2 (08 hrs)

**Lists:** The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List, List-like Types: Sequences and Tuples, References.

**Dictionaries and Structuring Data:** The Dictionary Data Type, Print Printing, Using Lists Sequences to Model Real World Things.

Textbook 1: Chapters 4 - 5

#### Module-3 (08 hrs)



	<p><b>Manipulating Strings:</b> Working with Strings, Useful String Methods, Project: Password Locker, Project: Adding Bullets to Wiki Markup</p> <p><b>Reading and Writing Files:</b> Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module, Saving Variables with the print.format() Function, Project: Generating Random Quiz Files, Project: Multiclipboard,</p> <p><b>Textbook 1: Chapters 6 , 8</b></p>
	<b>Module-4 (08 hrs)</b>
	<p><b>Organizing Files:</b> The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module, Project: Renaming Files with American-Style Dates to European-Style Dates, Project: Backing Up a Folder into a ZIP File,</p> <p><b>Debugging:</b> Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE's Debugger.</p> <p><b>Textbook 1: Chapters 9-10</b></p>
	<b>Module-5 (08 hrs)</b>
	<p><b>Classes and objects:</b> Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying,</p> <p><b>Classes and functions:</b> Time, Pure functions, Modifiers, Prototyping versus planning,</p> <p><b>Classes and methods:</b> Object-oriented features, Printing objects, Another example, A more complicated example, The init method, The __str__ method, Operator overloading, Type-based dispatch, Polymorphism, Interface and implementation,</p> <p><b>Textbook 2: Chapters 15 – 17</b></p>
<b>Course outcome (Course Skill Set)</b>	
At the end of the course the student will be able to:	
C01	Demonstrate proficiency in handling loops and creation of functions.
C02	Identify the methods to create and manipulate lists, tuples and dictionaries.
C03	Develop programs for string processing and file organization
C04	Interpret the concepts of Object-Oriented Programming as used in Python.
<b>Programming Exercises:</b>	
<ol style="list-style-type: none"> <li> <ol style="list-style-type: none"> <li>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.</li> <li>Develop a program to read the name and year of birth of a person. Display whether the person is a senior citizen or not.</li> </ol> </li> <li> <ol style="list-style-type: none"> <li>Develop a program to generate Fibonacci sequence of length (N). Read N from the console.</li> <li>Write a function to calculate factorial of a number. Develop a program to compute binomial coefficient (Given N and R).</li> </ol> </li> <li>Read N numbers from the console and create a list. Develop a program to print mean, variance and standard deviation with suitable messages.</li> <li>Read a multi-digit number (as chars) from the console. Develop a program to print the frequency of each digit with suitable message.</li> <li>Develop a program to print 10 most frequently appearing words in a text file. [Hint: Use dictionary]</li> </ol>	

evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.

- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (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): SEE for IC**

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

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
3. The students have to answer 5 full questions, selecting one full question from each module.

**The theory portion of the Integrated Course shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper shall include questions from the practical component).**

#### **Passing standard:**

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks-30) in the theory component and 08 (40% of maximum marks -20) 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. The maximum of 04/05 questions to be set from the practical component of IPCC, the total marks of all questions should not be more than 30 marks.

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]

6. 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(), readlines(), and write().]
7. 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.
8. 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.
9. 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 ( $N \geq 2$ ) complex numbers and to compute the addition of N complex numbers.
10. Develop a program that uses class Student which prompts the user to enter marks in three subjects and calculates total marks, percentage and displays the score card details. [Hint: Use list to store the marks in three subjects and total marks. Use \_\_init\_\_() method to initialize name, USN and the lists to store marks and total, Use getMarks() method to read marks into the list, and display() method to display the score card details.]

#### 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 sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

#### Continuous Internal Evaluation (CIE):

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

#### CIE for the theory component of the IC

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totaling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

#### CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be