II Semester

Integral Calculus and Ordinary Differential Equations

Course Code	**21BS21**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:2:0:0	SEE Marks	50
Total Hours of Pedagogy	50	Total Marks	100
Credits	04	Exam Hours	3 hours

Course Learning Objectives The course will enable the students to:

- Inter-relationship of line integral, double and triple integral formulations.
- Applications of multivariable calculus tools in physics, optimization, and understanding the architecture of curves and surfaces in a plane etc.
- Learn various techniques of getting exact solutions of solvable first-order differential equations and linear differential equations of higher order.
- Formulate mathematical models in the form of ordinary differential equations to suggest possible solutions in physical, chemical and biological disciplines.

Prerequisite: The students are well aware of the basic concept of Integration and the concept of a differential equation.

Teaching-Learning Process (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 student's 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 for 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: Integral Calculus 1

Reduction Formula

Reduction formulae for - $\int sin^n x\, dx$, $\int \cos^n x\, dx$, $\int \tan^n x\, dx$, $\int \sin^m x \cos^n x\, dx$ with definite limit, Problems.

Tracing of Curve: Cartesian and Polar Curves, Astroid, Cycloid and Cardioid.

Applications of Integral Calculus: Computation of length of an arc, plane area, surface area and volume of solids of revolution for standard curves in Cartesian and Polar forms Astroid, Cycloid and Cardioid.

Problems.

Self-study: $\int \cot^n x\, dx$, $\int cosec^n x\, dx$, $\int \sec^n x\, dx$. Problems on curves Lemniscate of Bernoulli, Folium of Descartes.

(RBT Levels: L1 & L2)

Teaching-Learning Process	Chalk and talk method/PowerPoint Presentation

Module-2: Integral Calculus 2

Multiple Integrals

Multiple integrals: Evaluation of double and triple integrals. Evaluation of double integrals by changing the order of integration, change of variables in double and triple integrals. Applications to find the area and volume.

Self-study: Center of gravity.

(RBT Levels: L1 & L2)

Teaching-Learning Process	Chalk and talk method/PowerPoint Presentation

Module-3: Beta and Gamma functions

Beta and Gamma functions: Definitions, Properties, Relation between beta and gamma functions, Recurrence relation, Duplication formula and problems.

Differentiation under integral sign by Leibnitz rule- problems.

Self-study: Integration as a limit of a sum.

(RBT Levels: Ll & L2)

Teaching-Learning Process	Chalk and talk method/PowerPoint Presentation

Module-4: Ordinary differential equations of the first order

Linear and Bernoulli's equation. Exact and reducible to exact differential equations. Applications of differential equations-Orthogonal Trajectories.

Nonlinear differential equations: Introduction to general and singular solutions, solvable for p, Clairaut's equations, Problems.

Self-study: Newton's law of cooling, L-R circuits

(RBT Levels: L1 &L2)

Teaching-Learning Process	Chalk and talk method/PowerPoint Presentation

Module-5:

Differential Equations of higher-order: - Second-order linear differential equations with constant coefficients. Inverse differential operator, Particular integral of e^{ax}, $sinax$, $cosax$. $p_n(x)$, $e^{ax}\phi(x)$, Method of variation of parameters.

Differential equation with a variable coefficient: Cauchy's and Legendre differential equations.

Self-study: Applications to the oscillation of a spring, free oscillation and L-C-R circuits.

(RBT Levels: L1, L2 & L3)

Teaching-Learning Process	Chalk and talk method/PowerPoint Presentation

Course outcome (Course Skill Set)

After successfully completing the course, the student will have a good understanding of the following topics and their applications:

- To understand the concept of integration to compute the physical applications in finding the area and volume of curves.
- Apply the knowledge of beta and gamma functions to evaluate the complicated integrals.
- To learn the solution techniques for solving first-order ordinary differential equations.
- To learn the solution techniques of solving the higher-order differential equations.
- Compute the eigenvalues and eigenvectors required for the matrix diagonalization process.

Assessment Details (both CIE and SEE)

(Methods of CIE need to define topic wise i.e.- MCQ, Quizzes, Open book test or Seminar)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 40% marks individually both in CIE and SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (3 Hours duration) and then it is reduced to 50. Based on this grading will be awarded.

Continuous Internal Evaluation:

1. Methods suggested: Test, Open Book test, Written Quiz, Seminar, Assignment, Report writing etc.
2. The class teacher has to decide the topic for the closed book test, open-book test, Written Quiz and Seminar. In the beginning, only the teacher has to announce the methods of CIE for the subject.
3. 10 marks weightage has to be given for **Self-Study component** (Via assignment / seminar / test).

Semester End Examination:

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

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

Books recommended:

1. Shanthi Narayan and P K Mittal, Integral Calculus, Reprint. New Delhi:
2. G.B. Thomas and R.L. Finney, Calculus, Pearson edition, 2007.
3. M.D Raisinghania, ordinary and Partial differential equations, S. Chand and Co. Pvt. Ltd., 2014.
4. S Narayanan & T K Manicavachogam Pillay, Calculus.: S. Viswanathan Pvt.Ltd., Vol. I & II, 1996.
5. Schaum's outline of theory and problems of Differential Equations-Frank Ayers, McGraw-Hill Publishing Co.

Web links and Video Lectures (e-Resources):

- http://.ac.in/courses.php?disciplineID=111
- http://www.class-central.com/subject/math(MOOCs)
- http://academicearth.org/
- VTU EDUSAT PROGRAMME-20

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

- Quiz
- Group assignment and
- Seminars

II Semester

THERMAL PHYSICS			
Course Code	21BS22	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2:2:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03

Course objectives:
After going through the course, the student will be able

- To understand the basic concepts of kinetic theory of gases, Laws of thermodynamics, entropy and different radiation laws.
- Analyse the conversion of thermal energy in to mechanical energy on the basis of thermodynamic laws, fate of universe in entropic terms, how earth is protected from harmful radiations with reference to radiation laws.
- Apply the principles of thermodynamics in heat engines, exhaust pumps and liquefaction of gases.
- Calculation of the increase of entropy and evaluation of numerical problems.

Teaching Learning Process (General Instructions)
These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes. .

1. In addition to conventional lectures alternative effective teaching methods could be adopted to attain objectives.
2. Various concepts of teaching could be communicated through Power point/videos /animations.
3. Encourage for group discussion/quizzes/seminars in classes.
4. Improve the creativity in students by solving the same problem in different methods.
5. Ask some reasoning and higher order thinking questions in classes which improves critical thinking in students.
6. To improve the understanding level of every student, discuss how every concept can be applied to daily life.

Module-1

Kinetic Theory of Gases **08 Hours**

Postulates of kinetic theory of gases, Maxwell's law of distribution of velocities (qualitative) & its experimental verification. Average, RMS, & most probable velocity (derivation). Mean free path, mention of Clausius and Maxwell's expressions for mean free path, Brownian motion, Einstein's expression (derivation), determination of Avogadro's number; Transport Phenomena-Viscosity, diffusion, expression for η & κ (derivations), Critical Constants (Derivation), Numerical problems.

Teaching Learning Process	Chalk and talk, Power point presentation, Videos **Self-study Component:** Viscosity, Problem based learning in kinetic theory of gases

Module-2

Thermodynamics **08 Hours**

Thermodynamics: Zeroth Law, First Law and Internal energy, Isothermal & adiabatic changes- indicator diagram. Derivation of PV^{γ}=constant. Carnot's engine – Working- its efficiency (Derivation) & Carnot's theorem
Heat engines: Otto engine, Otto cycle, expression for efficiency, Diesel engine, Diesel cycle, expression for efficiency, Numerical problems.

Teaching Learning Process	Chalk and talk, Power point presentation, Videos **Self study Component:** Experimental analysis of diesel engine and petrol engine(Facility@Mechanical Engineering)

Module-3

Entropy **08 Hours** Concept of entropy, change in entropy in reversible & irreversible processes, entropy-temperature diagram, second law of thermodynamics. Third law of Thermodynamics, Temperature Entropy diagram, Maxwell's relations-derivation of Maxwell's relations, applications to – i)Clausius - Clapeyron's equation ii) Clausius equations (specific heat of saturated vapours), Numerical problems.	
Teaching Learning Process	Chalk and talk, Power point presentation, Videos **Practical Topics:** 1. Specific heat of material **Self study Component:** Concept of entropy
Module-4	
Low Temperature Physics **08 Hours** Measurement of low temperature, exhaust pump & its characteristics, exhaust pressure, degree of vacuum attainable, speed of pump:-principle, construction & working of Diffusion pump & Ionization gauge Production of low temperature - Joule Thomson effect, Porous plug experiment with theory, Thermodynamical analysis of Joule Thomson effect, Liquefaction of Oxygen by cascade process, Liquefaction of Helium and its properties, Numerical problems.	
Teaching Learning Process	Chalk and talk, Power point presentation, Videos **Self study Component:** Cryogenics and its applications
Module-5	
Radiation & Thermal Conductivity **08 Hours** Radiation pressure (qualitative), Stefan's law & its derivation using radiation pressure. Laboratory method for determination of Stefan's constant. Energy Distribution in the Black body spectrum, Wein's displacement law with derivation, Rayleigh-Jeans's law (qualitative), Planck's law of radiation & its derivation (from the concept of oscillators).Ferry's total radiation pyrometer. Solar radiation and determination of solar constant Thermal Conductivity: Thermal conductivity, Thermal conductivity of good conductor by Searle's method, Thermal conductivity of bad conductor by Lee's and Charlton's method, Wideman-Franz law, Numerical problems.	
Teaching Learning Process	Chalk and talk, Power point presentation, Videos **Practical Topics:** 1. Stefan's Law 2. Stefan's constant 3. Solar constant 4. Thermal conductivity **Self study Component:** Understand the thermal conductivity of different materials

Course outcome (Course Skill Set)

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

1. Understand the basics of kinetic theory of gases, viscosity and diffusion in gases.
2. Comprehend the efficiency of Carnot's engine and the significance of first law and second of thermodynamics and implications of the second law of thermodynamics and limitations placed by the second law on the performance of thermodynamic systems.
3. Ability to evaluate entropy changes in a wide range of processes and determine the reversibility or irreversibility of a process from such calculations.
4. Realization and productions of low temperature, liquefy helium and hydrogen.
5. Have a clear understanding about laws of radiations, compute solar constant and thermal conductivity.

Assessment Details (both CIE and SEE)

(methods of CIE need to be define topic wise i.e.- MCQ, Quizzes, Open book test, Seminar or micro project)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain minimum of 40% marks individually both in CIE and SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (3 Hours duration). Based on this grading will be awarded.

Continuous Internal Evaluation:

1. Methods suggested: Test, Open Book test, Written Quiz, Seminar, report writing etc.
2. The class teacher has to decide the topic for closed book test, open book test, Written Quiz and Seminar. In the beginning only teacher has to announce the methods of CIE for the subject.

Semester End Examination:

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

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

Suggested Learning Resources:

Books

1. Kinetic Theory of Gases (I-Edition) – V.N.Kelkar – Ideal Book Service, Pune, 1967.
2. Kinetic Theory of Gases (II-Edition) – R.S.Bhoosnurmath – IBH Prakashana, Bangalore, 1981.
3. Heat & Thermodynamics and Statistical Physics(XVIII-Edition) – Singhal, Agarwal &Satyaprakash – Pragati Prakashan, Meerut, 2006.
4. Heat & Thermodynamics and Statistical Physics(I-Edition) – Brijlal , Subramanyam &Hemne - S. Chand & Company Ltd., New-Delhi, 2008.
5. Heat and Thermodynamics (I-Edition) – D.S.Mathur - S. Chand & Company Ltd., New-Delhi, 1991.
6. A Treatise on Heat – Shaha and Srivatsava.
   A text book of heat - J.B.Rajam

Web links and Video Lectures (e-Resources):

- https://www.youtube.com/watch?v=txOnRP5hwCE&list=PLwdnzlV3ogoX-WIPb5DnmmmUOVAgI5wrq
- https://www.motionmountain.net/online.html
- https://nptel.ac.in/courses/122/106/122106027/
- https://www.explainthatstuff.com/engines.html
- http://www.csun.edu/science/physics/index.html
- http://www2.phy.ilstu.edu/ptefiles/311content/resources/resources.html

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

- **https://www.vlab.co.in/broad-area-physical-sciences**
- **https://vlab.amrita.edu/index.php?sub=1&brch=195**
- **https://vlab.amrita.edu/index.php?sub=1&brch=194**

II Semester

CHEMISTRY.2			
Course Code	21BS22	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	2:2:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03

CLO 1	Explain the nature of chemical bonding in compounds. It provides basic knowledge about ionic, covalent and metallic bonding and explains molecular orbital theory and Group 1 elements.	Impart th using the shapes o ionizatio
CLO 2	Understand the basic concept of acidity & basicity, organic functional groups, which include oxygen containing functional groups and their reactivity patterns. The detailed reactions mechanistic pathways for each functional group will be discussed to unravel the spectrum of organic chemistry and the extent of organic transformations.	Explain t concepts heterolyt reagents
CLO 3	Interpret thermodynamic concepts, terminology, properties of thermodynamic systems, laws of thermodynamics and their correlation with other branches of physical chemistry and make them able to apply thermodynamic concepts to the system of variable compositions.	Understa indicator
CLO 4	Create awareness on Environmental pollution, knowledge on control of pollution and basic concepts of nano materials.	Creativel principle
CLO 5	Knowledge about industrial chemistry ,various manufacturing processes.	Handle a

Pedagogy (General Instructions)

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

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

1. Lecturer method (L) does not mean only traditional lecture method, but different type of teaching methods may be adopted to develop the outcomes.
2. Show Video/animation films to convince abstract concepts.
4. Encourage collaborative (Group Learning) Learning in the class
5. Ask at least three HOTS (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 analyse information rather than simply recall it.
7. Topics will be introduced in a multiple representation.
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.

Module-1 Inorganic Chemistry

1. **Inorganic molecules and their chemical bonding:** Electronic theory of valency, chemical bond, bond energy, ionic bond and ionic character, Fajan's rule and lattice energy, ionic ratio, Born-Haber cycle, energetics of covalent bond in hydrogen molecule-valence bond theory. Hybridization and VSEPR theory and geometry of molecules. Molecular orbital theory for homo and heteronuclear diatomic molecules with examples B_2, C_2, N_2, O_2, F_2, CO, NO, CN^-. Inter- and intra-molecular forces, H-bonding, metallic bonding: band theory.
2. **Group 1 (Li, Na, K, Rb, Cs):** Origin of flame colour and spectra, reactivity with water, air, and dinitrogen, anomalous reactivity of Li, dissolution in liquid ammonia, solvated electrons, oxides, hydroxides, peroxides and superoxides, sulphides, oxo salts, halides and hydrides, carbides and intercalation compounds, complexes of crown ethers and cryptands, soap

formation, biological importance.

Teaching-Learning Process	**Chalk and talk/power point presentation:** Born-Haber cycle, energetics of covalent bond in hydrogen molecule-valence bond theory. Hybridization and VSEPR theory and geometry of molecules. Molecular orbital theory for homo and heteronuclear diatomic molecules with examples. Inter- and intra-molecular forces, H-bonding, metallic bonding: band theory, and Group 1. **Videos/Learning material:** Properties of elements in Group 1 **Self-study:** chemical bond, bond energy, ionic bond and ionic character, Fajan's rule and lattice energy, ionic ratio

Module-2 Organic Chemistry

1. **Acidity and basicity:** Acids and bases, conjugate base and acid, pKa and pKb; factors affecting acidity and basicity, amphoteric compounds.
2. **Alcohols, phenols, ethers and Amino Acids:** Synthesis of alcohols from aldehydes, ketones, carboxylic acids and esters, hydrogen bonding, acidity and reactivity, pinacol-pinacolone rearrangement, nucleophilic substitution on alcohols, Misunobu reaction. Preparation of phenols, acidity comparison between alcohols and phenols, reactivity of phenols, Fries and Claisen rearrangement, Gatterman synthesis, Hauben- Hoesch reaction, Lederer-Manasse reaction, oxidation of phenols. Synthesis of ethers, acid and base-catalyzed ring opening, ring opening with organometallic reagents (organolithium, Grignard and Gilman reagents), reductive ring opening, nucleophilic and solvolytic ring opening.
   Classification, of amino acids. Acid- base behaviour, isoelectric point and electrophoresis. Preparation of - amino acids.

Teaching-Learning Process	**Chalk and talk/power point presentation**: Acidity and basicity, Alcohols, phenols, ethers, and amino acids **Videos/Learning material**: Alcohols, phenols, ethers and Amino Acids **Self-study:** RNA and DNA

Module-3 Physical Chemistry

1. Basic Thermodynamics and Chemical Equilibria: Laws of thermodynamics- zeroth, first, second and third, heat capacity of solids, description of equilibrium, feasibility of chemical reaction, Gibbs-Helmholtz equation, phase transition- Clapeyron equation, Clapeyron-Clausius equation, free energy and entropy changes in reversible and irreversible processes.

2. Catalysis: Homogeneous and heterogeneous catalysis, kinetics of acid, base and enzyme catalysis with suitable examples, principle of adsorption, differences between physisorption and chemisorption, derivation of Langmuir adsorption isotherm, Langmuir-Hinshelwood and Rideal-Eley mechanisms.

Teaching-Learning Process	**Chalk and talk/power point presentation**: Basic Thermodynamics and Chemical Equilibria, Catalysis. **Videos/Learning material**: Catalysis

	Self-study: Adsorption mechanisms: Langmuir-Hinshelwood and Rideal- Eley mechanisms.
Module-4 Material Chemistry	
1. Environmental Chemistry: Air Pollutants: Sources, effects and control of Primary air pollutants- Carbon monoxide, Oxides of nitrogen, Hydrocarbons and sulphur, e-waste & Biomedical waste management (scientific land filling, composting and recycling. **2. Nanomaterials:** Introduction, synthesis-solution combustion and Sol-gel methods. Characterization techniques-PXRD and SEM. Applications. Nano materials-Synthesis & applications of Carbon based nanomaterials- fullerenes, Carbon nano tubes & Graphene	
Teaching-Learning Process	**Chalk and talk/power point presentation**: Environmental Chemistry and Nanomaterials. **Videos/Learning material**: Synthesis of nanomaterials **Self-study:** Classification of nanomaterials, applications of nanomaterials in medicines.
Module 5: Industrial Chemistry	
1. Glass: Raw materials, glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass. **Ceramics:** Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre. **Cement:** Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cement 2. **Metallurgy:** Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon as reducing agent. Pyrometallurgy: Extraction of Nickel from sulphide ore – general metallurgy followed by Mond's process (purification) **Hydrometallurgy:** Extraction of gold from native ore by cyanide process and refining by quartation process. **Electrometallurgy:** Extraction of lithium by fusion method followed by electrolysis of lithium chloride. **Powder metallurgy:** Importance, and applications, production of tungsten powder. Principles of electroplating.	
Teaching-Learning Process	**Chalk and talk/power point presentation**: Glass, Ceramics, Cement, Metallurgy and Hydrometallurgy **Videos/Learning material**: Cement manufacturing process, Metallurgical processes **Self-study:** Electrometallurgy, powder metallurgical.

Course outcome (Course Skill Set)

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

CO 1	Discuss the chemical bonding and draw the plausible structures and geometries of molecules using Radius Ratio Rules, VSEPR theory and MO diagrams. And overview of Group 1 elements.	Discuss t
CO 2	Interpret the concept of synthetic chemistry learnt in this course to do functional group transformations.	Explain t synthesis
CO 3	Explain the three laws of thermodynamics and its applications and concept of catalysis.	Interpret reaction
CO 4	Enumerate the importance of. understanding the concepts of synthesis and characterization of nano-materials, understand the sources, consequences and its management of environmental pollution and solid waste management for the betterment of society	Enumera
CO 5	Illustrate the fundamental principles of industrial materials such as glass, ceramics and metallurgy.	Illustrate analysis.

Assessment Details (both CIE and SEE)

(methods of CIE need to be define topic wise i.e.- MCQ, Quizzes, Open book test, Seminar or micro project)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain minimum of 40% marks individually both in CIE and SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (3 Hours duration). Based on this grading will be awarded.

Continuous Internal Evaluation:

1. Methods suggested: Test, Open Book test, Written Quiz, Seminar, report writing etc.
2. The class teacher has to decide the topic for closed book test, open book test, Written Quiz and Seminar. In the beginning only teacher has to announce the methods of CIE for the subject.

Semester End Examination:

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

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.

Suggested Learning Resources:

Books

1. Lee, J.D.; (2010),**Concise Inorganic Chemistry**, Wiley India.
2. Huheey, J.E.; Keiter, E.A.; Keiter; R. L.; Medhi, O.K. (2009),**Inorganic Chemistry- Principles of Structure and Reactivity**, Pearson Education.
3. Douglas, B.E.; McDaniel, D.H.; Alexander, J.J.(1994),**Concepts and Models of Inorganic Chemistry**,John Wiley & Sons.
4. Atkins, P.W.; Overton, T.L.; Rourke, J.P.; Weller, M.T.; Armstrong, F.A. (2010),**Shriver and Atkins Inorganic Chemistry**, 5th Edition, Oxford University Press.
5. Morrison, R. N.; Boyd, R. N. **Organic Chemistry**, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
6. Finar, I. L. **Organic Chemistry** (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson

Education).

7. Ahluwalia, V.K.; Bhagat, P.; Aggarwal, R.; Chandra, R. (2005), **Intermediate for Organic Synthesis,**

8. Kapoor, K.L.(2013),**A Textbook of Physical Chemistry**,Vol 3, 3rd Edition, McGraw Hill Education.

9. McQuarrie, D. A.; Simon, J. D. (2004),**Molecular Thermodynamics**, Viva Books Pvt. Ltd.

10. Williams, Ian. *Environmental Chemistry, A Modular Approach*. Wiley. 2001. ISBN 0-471-48942-5

11 G.A. Ozin& A.C. Arsenault, "Nanotechnology "**A Chemical Approach to Nanomaterials**". RSC Publishing, 2005.

12. Poole Jr.; Charles P.; Owens, Frank J.(2003), **Introduction to Nanotechnology**, John Wiley and Sons.

13. Kent, J. A. (ed**)** (1997),**Riegel's Handbook of Industrial Chemistry**, CBS Publishers, New Delhi.

Web links and Video Lectures (e-Resources):

https://www.youtube.com/watch?v=CmiitvJiCPc

https://www.youtube.com/watch?v=tQn0SR_NAtY

https://www.youtube.com/watch?v=m_9bpZep1QM

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

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

Mathematics Laboratory Using Python			
Subject Code	**21BSL24**	CIE Marks	**50**
Hours/Week (L: T: P)	**1:0:2:0**	SEE Marks	**50**
Total Hours	**28**	Exam Hours	**03**
Semester: 2			**No. of Credits: 02**

Mathematics practical with Free and Open Source Software (FOSS) tool for computer programs (3 hours/week per batch of not more than 15 students)

Sl.NO	Experiments
1	Introduction to Python: Basic syntax, variable types, basic operators, numbers, strings, lists, tuples, functions and input/output statements.
2	Some simple programs to understand the relational, conditional and logical operators. i) Compare two numbers (less than, greater than) using if statement ii) Sum of natural numbers using while loop iii) Finding the factors of a number using for loop. iv) To check the given number is prime or not (use if... else statement). v) Find the factorial of a number (use if...if...else). Simple programs to illustrate logical operators (and, or, not) Note: Give the structure of a while...do loop to the students and illustrate with an example.
3	Python commands to reduce given matrix to echelon form and normal form with examples.
4	Python program/command to establish the consistency or otherwise and solving system of linear equations.
5	Python command to find the nth derivatives.
6	Python program to find nth derivative with and without Leibnitz rule.
7	Obtaining partial derivative of some standard functions
8	Verification of Euler's theorem, its extension and Jacobean.
9	Python program for reduction formula with or without limits.
10	Python program to find equation and plot sphere, cone, cylinder.
11	Plotting of standard curves.
12	Surface area and Volume of curves.
13	Solution of differential equation and plotting the solution.

Assessment Details (both CIE and SEE)

Continuous Internal Evaluation (CIE): The CIE marks awarded in case of Practical shall be based on the weekly evaluation of laboratory journals/ reports after the conduction of every experiment and one practical test.

Semester End Evaluation (SEE): The practical examinations are to be conducted as per the timetable of the University in a batch wise with the strength of students not more than 10-15 per batch.

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

II- Semester

Thermal Physics Lab			
Course Code	**21BSL25**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	**1L+0T+2P+0S**	SEE Marks	50
Credits	02	Exam Hours	3 Hours

Course objectives:

- To gain the knowledge of heat and temperature
- To verify various laws of heat and thermodynamics.

List of Experiments:

Any Eight experiments to be performed

Sl.NO	Experiments
1	Lee's method of determination of thermal conductivity of rubber
2	Thermal conductivity of poor conductor (perspex)
3	Specific heat by cooling
4	Verification of Stefan's Law.
5	Determination of Stefan's constant
6	'J' by electrical method – radiation correction by graphical method
7	'J' by continuous flow method
8	Solar Cell characteristics a) Open Circuit voltage b) short Circuit Current.
9	Determination of solar constant.
10	Specific heat by Newton's law of cooling.
	Demonstration Experiments (For CIE)
11	Calibration of thermistor for temperature measurements
12	Problem based learning in Physics: Problems on entropy, heat engines and Wideman-Franz law

Course outcomes (Course Skill Set):

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

1. Have a clear understanding of the laws of radiation,
2. Able to compute solar constant and thermal conductivity.
3. Able to calculate the thermal conductivity of materials

Assessment Details (both CIE and SEE)

Continuous Internal Evaluation (CIE): The CIE marks awarded in the case of Practical shall be based on the weekly evaluation of laboratory journals/ reports after the conduction of every experiment and one practical test.

Semester End Evaluation (SEE): The practical examinations are to be conducted as per the timetable of the University in a batch wise with the strength of students not more than 10-15 per batch.

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

Suggested Learning Resources:

https://vlab.amrita.edu/index.php?sub=1&brch=194&sim=353&cnt=1
http://vlabs.iitb.ac.in/vlabsdev/vlab_bootcamp/bootcamp/vlabs_recbanda/labs/exp1/index.html
https://vlab.amrita.edu/index.php?sub=1&brch=194&sim=548&cnt=1
https://vlab.amrita.edu/?sub=1&brch=195&sim=360&cnt=1
https://vlab.amrita.edu/index.php?sub=1&brch=194&sim=354&cnt=1
http://htv-au.vlabs.ac.in/heat-thermodynamics/Characteristics_of_Thermistor

II- Semester

CHEMISTRY LABORATORY-2			
Course Code	**21BSL26**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	1:0:2:0	SEE Marks	50
Credits	02	Exam Hours	03

Course objectives:

CLO1 Qualitative analysis of organic compounds.

CLO2 Qualitative analysis of Inorganic compounds.

Sl.NO	Experiments
	Section-A: Organic Chemistry Experiments
1	Systematic qualitative organic analysis of any five among following compounds 1. Acids 2. Alcohols 3. Aldehydes 4. Amides 5. Amines 6. Phenols 7. Hydrocarbons 8. Ketones 9. Nitro compounds 10. Ether
	Section B: Inorganic Chemistry Experiments
2	Semimicro qualitative analysis of mixture containing not more than four radicals (including interfering, Combinations and excluding insoluble one): Pb^{2+}, Hg^{2+}, Ag^{+}, Bi^{3+}, Cu^{2+}, Cd^{2+}, As^{3+}, Sb^{3+}, Sn^{2+}, Fe^{3+}, Cr^{3+}, Al^{3+}, Co^{2+}, Ni^{2+}, Mn^{2+}, Zn^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}, NH_4^{+} CO_3^{2-}, S^{2-}, SO_3^{2-}, $S_2O_3^{2-}$, NO_2^{-}, CH_3COO^{-}, Cl^{-}, Br^{-}, I^{-}, NO_3^{-}, SO_4^{2-}, $C_2O_4^{2-}$, PO_4^{3-}, BO_3^{3-}

Course outcomes (Course Skill Set):

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

CO1 Determine the qualitative analysis of organic compounds.

CO2 Interpret the ions by qualitative analysis of inorganic compounds.

II- Semester

Assessment Details (both CIE and SEE)

Continuous Internal Evaluation (CIE): The CIE marks awarded in case of Practical shall be based on the weekly evaluation of laboratory journals/ reports after the conduction of every experiment .

Semester End Evaluation (SEE): The practical examinations to be conducted as per the time table of University in a batch wise with strength of students not more than 10-15 per batch.

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

Suggested Learning Resources:

Text Books:

1 Vogel's Qualitative Inorganic Analysis, Svehla / Sivasankar 7th edition, Pearson Education India, 2012.

2 Vogel's Textbook of Practical Organic Chemistry, 5th Edition, Pearson Education India, 2003

ಬಿ.ಎಸ್ಸಿ- ದ್ವಿತೀಯ ಸೆಮಿಸ್ಟರ್, ಕನ್ನಡೇತರ ಮತ್ತು ಕನ್ನಡ ಭಾರದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಕ್ರಮ

(For Non Kannadiga Students -who do not know to speak, read and write kannada)

ಕರ್ನಾಟಕ ದರ್ಶನ – Karnataka Darshana

{For Non Kannadiga Students to Learn about Karnataka State and its Culture}

ವಿಷಯ ಸಂಕೇತ (Course Code)	**21KKD27**	ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನದ ಅಂಕಗಳು	**50**
ಒಂದು ವಾರಕ್ಕೆ ಬೋಧನಾ ಅವಧಿ (Teaching Hours/Week (L:T:P: S)	**L –3 , P-0, S-1 = 03** ಗಂಟೆಗಳು / ವಾರಕ್ಕೆ	ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯ ಅಂಕಗಳು	**50**
ಒಟ್ಟು ಬೋಧನಾ ಅವಧಿ Total Hours of Pedagogy	**40** ಗಂಟೆಗಳು	ಒಟ್ಟು ಅಂಕಗಳು	**100**
ಕ್ರೆಡಿಟ್ಸ್ (Credits)	**03**	ಪರೀಕ್ಷೆಯ ಅವಧಿ	**03**

ಕರ್ನಾಟಕ ದರ್ಶನ ಪಠ್ಯದ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು **(Course Learning Objectives):**

- To create the awareness about Kannada Language and Karnataka State.
- To enable learners to know about Karnataka State general information at different periods.
- To enable the learners to know about Karnataka's Art and Culture in different perspectives.

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. ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಬೋಧಿಸಲು ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.
2. ಪ್ರತಿಪಾಠ ಮತ್ತು ಪ್ರವಚನಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಪೂರಕ ಚಟುವಟಿಕೆಗಳಿಗೆ ಪ್ರೇರೇಪಿಸುವುದು. ಡಿಜಿಟಲ್ ತಂತ್ರಜ್ಞಾನದ ಮುಖಾಂತರ ಇತ್ತೀಚೆಗೆ ಡಿಜಿಟಲೀಕರಣಗೊಂಡಿರುವ ವಿಷಯಗಳನ್ನು ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ಮುಖಾಂತರ ಚರ್ಚಿಸಲು ಕ್ರಮಕ್ಕೆಗೊಳ್ಳುವುದು.
3. ಕರ್ನಾಟಕದ ಬಗ್ಗೆ ತಿಳಿಯಲು ಅನುಕೂಲವಾಗುವಂತೆ ಕಾರ್ಯಚಟುವಟಿಕೆಗಳನ್ನು ಮತ್ತು ಕ್ರಿಯಾ ಯೋಜನೆಗಳನ್ನು ರೂಪಿಸುವುದು.

Module-1

General Information about Karnataka State. The Role of Karnataka in Nation Building. Geographical Information of Karnataka. The Historical Background of Karnataka State. Special Information on the State of Karnataka in different perspectives.

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

Module-2

Karnataka is – "One State Many Worlds", Cultures of Karnataka, (Languages, Religions, Literature, Cinema and Theatre). Cultural Institutions of Karnataka. Architecture of Karnataka, – Important Palaces and forts in Karnataka, Sculptures in Karnataka, Paintings of Karnataka.

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

Module-3	
Dance Forms in Karnataka, Famous Karnataka dances and Dancers. Musical Instruments of Karnataka, Carnatic music and Hindustani music, Song Forms of Karnataka, Festivals of Karnataka and its importance.	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.
Module-4	
Karnataka's religion and philosophy, socio religious reforms movements in Karnataka. UNESCO's world heritage sites of Karnataka, The role of foreign writers and Travelers in Kannada Literature and history. Freedom movement in Karnataka.	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.
Module-5	
Social Institutions of Karnataka, Famous personalities of Karnataka & their important contributions. Capital city of Karnataka "Bengaluru" – List of Important places of Karnataka, General road map & guidelines to Karnataka tourism. Industries & Important crops of Karnataka. Awards & honours of Karnataka state.	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

Course Outcomes (Course Skill Set): At the end of the Course, The Students will be able :

1. To understand the Karnataka state all required general information.
2. To know the importance Karnataka's Art and Culture..
3. To easily move in the state for tourism and also will spread the state information to his friends and Families to know about Karnataka.

Assessment Details (both CIE and SEE)

(methods of CIE need to be define topic wise i.e.- MCQ, Quizzes, Open book test, Seminar or micro project)

The weight age of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 40% marks individually both in CIE and 35% marks in SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (03 hours duration). Based on this grading will be awarded.

ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನದ ಪ್ರಕ್ರಿಯೆ ಈ ಕೆಳಗಿನಂತಿರುತ್ತದೆ-Continuous Internal Evaluation -CIE:

1. ಸೂಚಿಸಿದ ವಿಧಾನಗಳು : ಕಿರುಪರೀಕ್ಷೆ, ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳು, ವಿದ್ಯಾರ್ಥಿಗಳ ಸಂವಹನ ಕೌಶಲ್ಯವನ್ನು ಪ್ರಸ್ತುತಪಡಿಸಲು ಅನುಕೂಲವಾಗುವಂತಹ ಪಠ್ಯಾಧಾರಿತ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳುವುದು.
2. ಅಸೈನ್ಮೆಂಟ್ ಗಳನ್ನು ನೀಡುವುದು, ಪ್ರಬಂಧ ಸ್ಪರ್ಧೆ/ಚರ್ಚಾ ಸ್ಪರ್ಧೆಗಳು ಮತ್ತು ರಸಪ್ರಶ್ನೆ ಮಾದರಿಯ ಚಟುವಟಿಕೆಗಳನ್ನು ಆಯೋಜಿಸುವುದು. ಈ ರೀತಿಯಲ್ಲಿ ಮೌಲ್ಯಮಾಪನವನ್ನು ಮಾಡಬಹುದಾಗಿರುತ್ತದೆ.
3. ಪ್ರತಿಯೊಂದು ವಿಭಾಗದ ಪಠ್ಯ ಭಾಗ ಮೇಲಿನ ಮೌಲ್ಯಮಾಪನ ಪ್ರಕ್ರಿಯೆಯಲ್ಲಿ ಬರುವಂತೆ ನೋಡಿಕೊಳ್ಳುವುದು.

ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯು ಈ ಕೆಳಗಿನಂತಿರುತ್ತದೆ - **Semester End Exam (SEE):**

1. ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯಲ್ಲಿ 10 ಪೂರ್ಣಪ್ರಮಾಣದ ಪ್ರಶ್ನೆಗಳು ಇರುತ್ತವೆ. ಪ್ರತಿಪ್ರಶ್ನೆ 20 ಅಂಕಗಳಿಗೆ ಇರುತ್ತದೆ.
2. ಪ್ರತಿಯೊಂದು ವಿಭಾಗದಿಂದ 2 ಪೂರ್ಣ ಪ್ರಶ್ನೆಗಳು ಇರುತ್ತವೆ.
3. ಪ್ರತಿಯೊಂದು ಪೂರ್ಣ ಪ್ರಶ್ನೆಗೆ ಪೂರಕವಾಗಿ ಮತ್ತು ಸಂಬಂಧಿಸಿದಂತೆ ಉಪ ಪ್ರಶ್ನೆಗಳು ಇರುತ್ತವೆ.
4. ವಿದ್ಯಾರ್ಥಿ 10 ಪೂರ್ಣಪ್ರಮಾಣದ ಪ್ರಶ್ನೆಗಳಲ್ಲಿ 05 ಕ್ಕೆ ಉತ್ತರಿಸಬೇಕು. ಉತ್ತರಿಸುವಾಗ ಪ್ರತಿ ವಿಭಾಗದಿಂದ ಒಂದು ಪೂರ್ಣಪ್ರಮಾಣದ ಪ್ರಶ್ನೆಯನ್ನು ಉತ್ತರಿಸಬೇಕು.

Suggested Text Books:

1. **Karnataka Parampare - Vol I and II** – Published by Department of Kannada and Culture, GoK.
2. **Karnataka Dharshana** –Published by Infonite Learning Solutions, Bangaluru.
3. **Off to Karnataka -** (Discover India State Wise) by Sonia Mehta

Suggested Learning Resources for Reference :

1. **A Concise History of Karnataka** by Dr Sooryanaatha Kaamath – January 2017
2. **Glimpses of Karnataka Folklore** – by Hebbale Nagesh, Publisher : Bharatiya Kala Prakashan.
3. **A compendium of Indian art and culture** – S Baliyan Oxford University Press New Delhi– 2020
4. **Geography of Karnataka** by Dr. Ranganath.– January 2016.
5. **Indian art and culture** – Nitin Singhania – McGraw Hill Education(India) Private Limited New Delhi – 2016

ಬಿ.ಎಸ್ಸಿ- ದ್ವಿತೀಯ ಸೆಮಿಸ್ಟರ್, ಕನ್ನಡ ಬಲ್ಲ ಮತ್ತು ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಕ್ರಮ

(For Kannadiga Students – who knows to speak, read and write kannada)

ಸಾಹಿತ್ಯ ಸಿಂಚನ

ವಿಷಯ ಸಂಕೇತ (Course Code)	**21KSS27**	ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನದ ಅಂಕಗಳು (CIE)	**50**
ಒಂದು ವಾರಕ್ಕೆ ಬೋಧನಾ ಅವಧಿ (Teaching Hours/Week (L:T:P: S)	**L –3 , P-0, S-1 = 03** ಗಂಟೆಗಳು / ವಾರಕ್ಕೆ	ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯ ಅಂಕಗಳು (SEE)	**50**
ಒಟ್ಟು ಬೋಧನಾ ಅವಧಿ Total Hours of Pedagogy	**40** ಗಂಟೆಗಳು	ಒಟ್ಟು ಅಂಕಗಳು	**100**
ಕ್ರೆಡಿಟ್ಸ್ (Credits)	**03**	ಪರೀಕ್ಷೆಯ ಅವಧಿ	**03**

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯದ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು **(Course Objectives):**

- ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಸಾಹಿತ್ಯ, ಸಂಸ್ಕೃತಿ ಮತ್ತು ನಾಡು ನುಡಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
- ತಾಂತ್ರಿಕ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಹಳೆಗನ್ನಡ, ನಡುಗನ್ನಡ ಮತ್ತು ಆಧುನಿಕ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆಯ ಪ್ರಮುಖ ಕಾಲಘಟ್ಟಗಳ ಸಾಹಿತ್ಯದ ಪರಿಚಯವನ್ನು ಮಾಡಿಕೊಡುವುದು.
- ನಾಡು-ನುಡಿಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ವಿವಿಧ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.

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. ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.
2. ಡಿಜಿಟಲ್ ತಂತ್ರಜ್ಞಾನದ ಮುಖಾಂತರ ಇತ್ತೀಚೆಗೆ ಡಿಜಿಟಲೀಕರಣ ಗೊಂಡಿರುವ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿ, ನಾಡು-ನುಡಿಯ ಅಂಶಗಳನ್ನು ತರಗತಿಯಲ್ಲಿ ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ಮುಖಾಂತರ ಚರ್ಚಿಸಲು ಕ್ರಮಕೈಗೊಳ್ಳುವುದು.
3. ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು ಸೂಕ್ತ - ಅಂದರೆ ಕವಿ-ಕಾವ್ಯ ಪರಿಚಯ ದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣವನ್ನು ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಜಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು.

ಘಟಕ - 1

1. ಕರ್ನಾಟಕದ ಸಂಕ್ಷಿಪ್ತ ಇತಿಹಾಸ
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಸಂಕ್ಷಿಪ್ತ ಚರಿತ್ರೆ
3. ಹಳೆಗನ್ನಡ ಸಾಹಿತ್ಯ - ಪಂಪ ಪೂರ್ವ ಯುಗ
4. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ರಚನೆಗೆ ಪ್ರಮುಖ ಪ್ರೇರಣೆಗಳು ಮತ್ತು ಪ್ರಭಾವಗಳು,
5. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಂಪರೆ ಮತ್ತು ರಾಜಾಶ್ರಯ
6. ಕವಿರಾಜಮಾರ್ಗ ಮತ್ತು ವಡ್ಡಾರಾಧನೆ

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ :

ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

ಘಟಕ - 2

1. ಪಂಪ / ಚಂಪೂ ಯುಗದ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಮತ್ತು ಪರಂಪರೆ
2. ಆದಿಕವಿ ಪಂಪ, ರನ್ನ, ಪೊನ್ನ ಮತ್ತು ಜನ್ನ
3. ಒಂದನೇ ನಾಗವರ್ಮ, ನಾಗಚಂದ್ರ, 10 ಮತ್ತು 11ನೇ ಶತಮಾನದ ಸಮಕಾಲೀನ ಪ್ರಮುಖ ಕವಿಗಳು
4. ನಡುಗನ್ನಡ ಸಾಹಿತ್ಯ - ವಚನ ಸಾಹಿತ್ಯ / ಬಸವ ಯುಗ
5. ವಚನ ಸಾಹಿತ್ಯದ ಬೆಳವಣಿಗೆಗೆ ಕಾರಣಗಳು ಮತ್ತು ಅದರ ಮಹತ್ವ
6. ಪ್ರಮುಖ ವಚನಕಾರರು, ವಚನ ಸಾಹಿತ್ಯದಲ್ಲಿ ವೈಚಾರಿಕತೆ ಮತ್ತು ಕಾಯಕ ತತ್ವ
7. ಕುಮಾರವ್ಯಾಸ ಯುಗ ಮತ್ತು ಸಾಹಿತ್ಯದ ಇತರೆ ರೂಪಗಳು - ರಗಳೆ – ಹರಿಹರ, ಷಟ್ಪದಿ – ಕುಮಾರವ್ಯಾಸ, ಲಕ್ಷ್ಮೀಶ, ರಾಘವಾಂಕ, ಸಾಂಗತ್ಯ - ರತ್ನಾಕರವರ್ಣಿ,

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ :

ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

ಘಟಕ - 3

1. ದಾಸ ಸಾಹಿತ್ಯ / ಕೀರ್ತನೆಗಳು - ಪುರಂದರದಾಸರು, ಕನಕದಾಸರು ಮತ್ತು ಇತರೆ ಕೀರ್ತನೆಕಾರಾರು
2. ತ್ರಿಪದಿ - ಸರ್ವಜ್ಞ, ಜಾನಪದ ಸಾಹಿತ್ಯ, ತತ್ವಪದಗಳು - ಶಿಶುನಾಳ ಶರೀಫರು
3. ಮಹಿಳಾ ಸಾಹಿತ್ಯ : ಹೆಳವನಕಟ್ಟೆ ಗಿರಿಯಮ್ಮ ಮತ್ತು ಸಂಚಿಹೊನ್ನಮ್ಮ
4. ಆಧುನಿಕ ಪೂರ್ವ ಕನ್ನಡ ಸಾಹಿತ್ಯ : ಕೆಂಪುನಾರಾಯಣ ಮತ್ತು ಮುದ್ದಣ
5. ಹೊಸಗನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ - ಪ್ರಭಾವಗಳು ಮತ್ತು ಪ್ರೇರಣೆಗಳು
6. ಹೊಸಗನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ ಬೆಳೆದು ಬಂದ ದಾರಿ
7. ಹೊಸಗನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಮುಖ ಪ್ರಕಾರಗಳು

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ :

ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

ಘಟಕ - 4

1. ಆಧುನಿಕ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಮುಖ ಕವಿಗಳು ಮತ್ತು ಸಾಹಿತ್ಯ - ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿ ಪುರಸ್ಕೃತ ಸಾಹಿತಿಗಳ ಪರಿಚಯ
2. ಆಧುನಿಕ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಮುಖ ಕವಿಗಳು ಮತ್ತು ಸಾಹಿತ್ಯ - (ಪ್ರಮುಖ ಪಂಥದ/ಪ್ರಕಾರಗಳ ಸಾಹಿತಿಗಳು – ಮಾಹಿತಿಗಾಗಿ)
3. ಡಿವಿಜಿಯವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಆಯ್ದು ಪದ್ಯಭಾಗಗಳು
4. ಕುವೆಂಪು - “ನೀಂ ಮಹಚ್ಚಿಲ್ಪಿ ದಿಟಂ”
5. ದ ರಾ ಬೇಂದ್ರೆ - ನಾದಲೀಲೆ ಯಿಂದ “ನೀ ಹಿಂಗೆ ನೋಡಬ್ಯಾಡ ನನ್ನ”
6. ಜಿ. ಎಸ್. ಶಿವರುದ್ರಪ್ಪ - “ಕಾಣದ ಕಡಲಿಗೆ ಹಂಬಲಿಸಿದೆ ಮನ”

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ :

ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

ಘಟಕ - 5

1. ವೈಚಾರಿಕತೆಯ ಲೇಖನ - ನೇಮಿಚಂದ್ರರವರ "ಸೋಲೆಂಬುದು ಅಲ್ಪವಿರಾಮ" ಲೇಖನ
2. ಕನ್ನಡದ ಉಪಭಾಷೆಗಳು – ಡಾ. ಎಲ್ ತಿಮ್ಮೇಶ
3. ಷೇರುಪೇಟೆ, ಹಣಕಾಸು ನಿರ್ವಹಣೆ ಮತ್ತು ಮಾರುಕಟ್ಟೆ– ಟಿ. ಎಲ್. ರವೀಂದ್ರ
4. ಜಾಗತಿಕ ಸನ್ನಿವೇಶದಲ್ಲಿ ತಾಂತ್ರಿಕ ಸಂವಹನ ಕೌಶಲ್ಯಗಳ ಮಹತ್ವ
5. ತಾಂತ್ರಿಕ ಭಾಷೆ, ಸಂವಹನ & ಉದ್ಯೋಗ- ಡಾ. ಎಲ್ ತಿಮ್ಮೇಶ ಮತ್ತು ಡಾ. ಅಪ್ಪಾಸಾಬ ಎಲ್. ವಿ

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ :

ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

ಸಾಹಿತ್ಯ ಸಿಂಚನ ಪಠ್ಯದ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಅನುಕೂಲಗಳು ಮತ್ತು ಫಲಿತಾಂಶಗಳು: **course Outcomes (Course Skill Set) :**

1. ಕನ್ನಡ ಸಾಹಿತ್ಯ, ಭಾಷೆ, ಸಂಸ್ಕೃತಿ ಮತ್ತು ನಾಡು ನುಡಿಯ ಕುರಿತು ಆಳವಾದ ಜ್ಞಾನವನ್ನು ಗಳಿಸುತ್ತಾರೆ.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಮುಖ ಕಾಲಘಟ್ಟಗಳ ಚರಿತ್ರೆಯನ್ನು ಪ್ರಮುಖ ಕವಿಗಳು ಮತ್ತು ಅವರ ಸಾಹಿತ್ಯದ ನಿರೂಪಣೆಯಿಂದ ಅರ್ಥೈಸಿಕೊಳ್ಳುತ್ತಾರೆ.
3. ಕನ್ನಡ ಸಾಹಿತ್ಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಹಲವಾರು ವಿಷಯಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.
4. ಕನ್ನಡ ಭಾಷೆಯ ಬಳಕೆ ಮತ್ತು ಸಂವಹನ ಎರಡರಲ್ಲಿಯೂ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುತ್ತದೆ.

ಮೌಲ್ಯಮಾಪನದ ಮಾಹಿತಿ **(Assessment Details- both CIE and SEE)**

(methods of CIE need to be definetopic wise i.e.- MCQ, Quizzes, Open book test, Seminar or micro project)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 40% marks individually both in CIE and 35% marks in SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (03hours duration). Based on this grading will be awarded.

ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನದ ಪ್ರಕ್ರಿಯೆ ಈ ಕೆಳಗಿನಂತಿರುತ್ತದೆ- **Continuous Internal Evaluation (CIE) :**

1. ಸೂಚಿಸಿದ ವಿಧಾನಗಳು : ಕಿರುಪರೀಕ್ಷೆ, ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳು, ವಿದ್ಯಾರ್ಥಿಗಳ ಭಾಷಾ ಸಂವಹನ ಕೌಶಲ್ಯವನ್ನು ಪ್ರಸ್ತುತಪಡಿಸಲು ಅನುಕೂಲವಾಗುವಂತಹ ಪಠ್ಯಾಧಾರಿತ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳುವುದು.
2. ಅಸೈನ್ಮೆಂಟ್ ಗಳನ್ನು ನೀಡುವುದು, ಪ್ರಬಂಧ ಸ್ಪರ್ಧೆ/ಚರ್ಚಾ ಸ್ಪರ್ಧೆಗಳು ಮತ್ತು ರಸಪ್ರಶ್ನೆ ಮಾದರಿಯ ಚಟುವಟಿಕೆಗಳನ್ನು ಆಯೋಜಿಸುವುದು. ಈ ರೀತಿಯಲ್ಲಿ ಮೌಲ್ಯಮಾಪನವನ್ನು ಮಾಡಬಹುದಾಗಿರುತ್ತದೆ.
3. ಪ್ರತಿಯೊಂದು ವಿಭಾಗದ ಪಠ್ಯ ಭಾಗ ಮೇಲಿನ ಮೌಲ್ಯಮಾಪನ ಪ್ರಕ್ರಿಯೆಯಲ್ಲಿ ಬರುವಂತೆ ನೋಡಿಕೊಳ್ಳುವುದು.

ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯು ಈ ಕೆಳಗಿನಂತಿರುತ್ತದೆ - **Semester End Exam (SEE):**

1. ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯಲ್ಲಿ **10** ಪೂರ್ಣಪ್ರಮಾಣದ ಪ್ರಶ್ನೆಗಳು ಇರುತ್ತವೆ. ಪ್ರತಿಪ್ರಶ್ನೆ **20** ಅಂಕಗಳಿಗೆ ಇರುತ್ತದೆ.
2. ಪ್ರತಿಯೊಂದು ವಿಭಾಗದಿಂದ **2** ಪೂರ್ಣ ಪ್ರಶ್ನೆಗಳು ಇರುತ್ತವೆ.
3. ಪ್ರತಿಯೊಂದು ಪೂರ್ಣ ಪ್ರಶ್ನೆಗೆ ಪೂರಕವಾಗಿ ಮತ್ತು ಸಂಬಂಧಿಸಿದಂತೆ ಉಪ ಪ್ರಶ್ನೆಗಳು ಇರುತ್ತವೆ.
4. ವಿದ್ಯಾರ್ಥಿ **10** ಪೂರ್ಣಪ್ರಮಾಣದ ಪ್ರಶ್ನೆಗಳಲ್ಲಿ **05** ಕ್ಕೆ ಉತ್ತರಿಸಬೇಕು. ಉತ್ತರಿಸುವಾಗ ಪ್ರತಿ ವಿಭಾಗದಿಂದ ಒಂದು ಪೂರ್ಣಪ್ರಮಾಣದ ಪ್ರಶ್ನೆಯನ್ನು ಉತ್ತರಿಸಬೇಕು.

Suggested Text Books (ನಿಗದಿಪಡಿಸಿದ ಪರಾಮರ್ಶನ ಗ್ರಂಥಗಳು**) :**

1. "ಕನ್ನಡ ಸಾಹಿತ್ಯ ಸಿಂಚನ –ಕೈಪಿಡಿ", ಪ್ರಕಾಶಕರು -ಇನ್ಫೋನೈಟ್ ಲರ್ನಿಂಗ್ ಸಲ್ಯೂಷನ್ಸ್, ಬೆಂಗಳೂರು.

- **(ಮಾಡ್ಯೂಲ್ - 1, 2, 3 ಮತ್ತು 4 ಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ)**

2. "ಸಾಹಿತ್ಯ ಸಿಂಚನ ಭಾಗ 1 ಮತ್ತು 2", ಡಿಪ್ಲೋಮಾ ದ್ವಿತೀಯ ಮತ್ತು ತೃತೀಯ ಸೆಮಿಸ್ಟರ್

ಪಠ್ಯಪುಸ್ತಕಗಳು, ಕಾಲೇಜು ಮತ್ತು ತಾಂತ್ರಿಕ ಶಿಕ್ಷಣ ಇಲಾಖೆ, ಬೆಂಗಳೂರು.

- **(ಮಾಡ್ಯೂಲ್ - 2, 3 ಮತ್ತು 4 ಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ)**

3. ತಾಂತ್ರಿಕ ಸಂವಹನ ಕೌಶಲ್ಯಗಳು, ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ ಬೆಳಗಾವಿ.

- **(ಮಾಡ್ಯೂಲ್ –5 ಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ)**

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ಹೆಚ್ಚುವರಿ ಸಮಗ್ರ ಅಧ್ಯಯನಕ್ಕಾಗಿ

1. ಆಡಳಿತ ಕನ್ನಡ - ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ ಬೆಳಗಾವಿ.

2. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ - ರಂ ಶ್ರೀ ಮುಗಳಿ, ಗೀತಾ ಬುಕ್ ಹೌಸ್ ಮೈಸೂರು.
   (ಹೆಚ್ಚುವರಿ ಸಮಗ್ರ ಅಧ್ಯಯನಕ್ಕಾಗಿ)

3. ಹೊಸಗನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ - ಎಲ್.ಎಸ್.ಶೇಷಗಿರಿ ರಾವ್, ಸಪ್ನಾ ಬುಕ್ ಹೌಸ್ ಬೆಂಗಳೂರು.
   (ಹೆಚ್ಚುವರಿ ಸಮಗ್ರ ಅಧ್ಯಯನಕ್ಕಾಗಿ)

4. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಕೋಶ – ಸಂಪಾದಕರು, ಡಾ. ರಾಜಪ್ಪ ದಳವಾಯಿ, ಡಾ. ರಾಜಪ್ಪ ದಳವಾಯಿ
   ತರಬೇತಿ ಕೇಂದ್ರ

5. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್ತು, ಕನ್ನಡ ಅಭಿವೃದ್ಧಿ ಪ್ರಾಧಿಕಾರ ಮತ್ತು ಕನ್ನಡ ಹಾಗೂ ಸಂಸ್ಕೃತಿ ಇಲಾಖೆಯು
   ಈಗಾಗಲೇ ಪ್ರಕಟಿಸಿರುವ ಕನ್ನಡ ನಾಡು ನುಡಿ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ವಿಷಯಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ
   ಪ್ರಕಟಣೆಗಳನ್ನು ಮತ್ತು ಪುಸ್ತಕ ಗಳನ್ನು ಗಮನಿಸುವುದು.

II Semester

Professional Writing Skills in English			
Course Code	**21EGH28**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	1:1:1	SEE Marks	50
Total Hours of Pedagogy	03 Hours/Week	Total Marks	100
Credits	02	Exam Hours	2 hour

Course objectives:

The course (21EGH28) will enable the students ,

- To Identify the Common Errors in Writing and Speaking of English.
- To Achieve better Technical writing and Presentation skillsfor employment.
- To read Technical proposals properly and make them to Write good technical reports.
- Acquire Employment and Workplace communication skills.
- To learn about Tequniqes of Information Transfer through presentation in different level.

Language Lab : 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.

Teaching-Learning Process (General Instructions)

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

- ✓ 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.
  (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 through language Labs in teaching of of LSRW skills.
- ✓ 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.

Module-1

Identifying Common Errors in Writing and Speaking English :

- Advanced English Grammar for Professionals with exercises, Common errors identification in parts of speech, Use of verbs and phrasal verbs, Auxiliary verbs and their forms,Subject Verb Agreement (Concord Rules with Exercises).
- Common errors in Subject-verb agreement, Noun-pronoun agreement, Sequence of Tenses and errors identification in Tenses.Advanced English Vocabulary and its types with exercises – Verbal Analogies, Words Confused/Misused.

Teaching-Learning Process	Chalk and talk method, PowerPoint presentation to teach Communication skills (LSRW Skills), Creating real time stations in classroom discussions, Giving activities and assignments (Connecting Campus & community with companies real time situations).

Module-2

Nature and Style of sensible writing :

- Organizing Principles of Paragraphs in Documents, Writing Introduction and Conclusion, Importance of Proper Punctuation, The Art of Condensation (Precise writing) and Techniques in Essay writing, Common Errors due to Indianism in English Communication, Creating Coherence and Cohesion, Sentence arrangements exercises, Practice of Sentence Corrections activities.Importance of Summarising and Paraphrasing.
- Misplaced modifiers, Contractions, Collocations, Word Order, Errors due to the Confusion of words, Common errors in the use of Idioms and phrases, Gender, Singular & Plural. Redundancies & Clichés.

Teaching-Learning Process	Chalk and talk method, PowerPoint presentation and Animation videos to teach phonetics in Practical method, creating real time stations in classroom discussions, Giving activities and assignments (Connecting Campus & community with companies real time situations).

Module-3

Technical Reading and Writing Practices :

- Reading Process and Reading Strategies, Introduction to Technical writing process, Understanding of writing process, Effective Technical Reading and Writing Practices, 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 – Voice and Speech (Active and Passive Voices) and Reported Speech, Spotting Error Exercises, Sentence Improvement Exercises, Cloze Test and Theme Detection Exercises.

Teaching-Learning Process	Chalk and talk method, PowerPoint presentation to teach Grammar, Animation videos on communication and language skills, creating real time stations in classroom discussions, Giving activities and assignments (Connecting Campus & community with companies real time situations).

Module-4

Professional Communication for Employment :

- The Listening Comprehension, Importance of Listening Comprehension, Types of Listening, Understanding and Interpreting, Listening Barriers, Improving Listening Skills. Attributes of a good and poor listener.
- Reading Skills and Reading Comprehension, Active and Passive Reading, Tips for effective reading.
- Preparing for Job Application, Components of a Formal Letter, Formats and Types of official, employment, Business Letters, Resume vs Bio Data, Profile, CV and others, Types of resume, Writing effective resume for employment, Model Letter of Application (Cover Letter) with Resume, Emails, Blog Writing, Memos (Types of Memos) and other recent communication types.

Teaching-Learning Process	Chalk and talk method, PowerPoint presentation to teach Grammar and phonetics, Animation videos on communication and language skills, creating real time stations in classroom discussions, Giving activities and assignments (Connecting Campus & community with companies real time situations).

Module-5

Professional Communication at Workplace:

- Group Discussions – Importance, Characteristics, Strategies of a Group Discussions. Group Discussions is a Tool for Selection. Employment/ Job Interviews - Importance, Characteristics, Strategies of aEmployment/ Job Interviews. Intra and Interpersonal Communication Skills - Importance, Characteristics, Strategies of aIntra and Interpersonal Communication Skills. Non-Verbal Communication Skills (Body Language) and its importance in GD and PI/JI/EI.
- Presentation skills and Formal Presentations by Students - Importance, Characteristics, Strategies of Presentation Skills. Dialogues in Various Situations (Activity based Practical Sessions in class by Students).

Teaching-Learning Process	Chalk and talk method, PowerPoint presentation to teach Grammar and phonetics, Animation videos on communication and language skills, creating real time stations in classroom discussions, Giving activities and assignments (Connecting Campus & community with companies real time situations).

Course outcome (Course Skill Set)

At the end of the course(21EGH28) the student will be able :

1. To understand andidentify the Common Errors in Writing and Speaking.
2. To Achieve better Technical writing and Presentation skills.
3. To read Technical proposals properly and make them to Write good technical reports.
4. Acquire Employment and Workplace communication skills.
5. To learn about Techniques of Information Transfer through presentation in different level.

Assessment Details (both CIE and SEE)

Continuous internal evaluation (CIE) needs to be conducted for 50 marks like Engineering courses. The weight age of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 40% of maximum marks in CIE and 35% of maximum marks in SEE to pass. MCQ Pattern (Multiple Choice Questions) Semester End Exam (SEE) is conducted for 50 marks (120 minutes duration). Based on this grading will be awarded.

Continuous Internal Evaluation (CIE) :

Three Unit Tests each of **20 Marks (duration 01 hour**)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

All the tests are preferred similar to SEE pattern; however, the teacher may follow test pattern similar to other theory courses of Engineering

Two assignments each of **10 Marks**

1. First assignment at the end of 4th week of the semester
2. Second assignment at the end of 9th week of the semester
3. Report writing /Group discussion/Seminar any one of three suitably planned to attain the COs and POs for **20 Marks**(**duration 01 hours**)
4. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination (SEE) :

SEE paper will be set for 100 questions of each of 01 marks. The pattern of the question paper is MCQ. The time allotted for SEE is 120 minutes**.** Marks scored are scaled down to 50 Marks. *(Time duration may be made 90 minutes to train the students for engineering / non-engineering competitive examination)*

1. Professional Writing Skills in English have become a very important component in all engineering and non-engineering competitive examinations. In exams like GRE, TOEFL, IELTS and GATE exam, all state and Central Government recruitment examinations, placement tests and other Examinations, so the pattern of question paper, in general, will be in multiple-choice question (MCQ) Pattern. So, to meet the relevance of the recruitment requirement of our Engineering students "Professional writing skill in English" Semester end examination (SEE) will be conducted in a multiple choice question (MCQ) pattern.
2. MCQ Pattern (Multiple Choice Questions) Semester End Exam (SEE) is conducted for 50 marks (120 minutes duration).

Suggested Learning Resources:

1. **A Course in Technical English,** Cambridge University Press – 2020.
2. **Functional English** (**As per AICTE 2018 Model Curriculam**) Cengage learning India Pvt Limited [Latest Revised Edition] - 2020.
3. **Communication Skills** by Sanjay Kumar and Pushp Lata, Oxford University Press - 2018. **Refer it's workbook** for activities and exercises –"Communication Skills – I (A Workbook)" published by Oxford University Press – 2018.
4. **Professional Writing Skills in English,** Infinite Learning Solutions – (Revised Edition) 2021.
5. **Technical Communication** – Principles and Practice, Third Edition by Meenakshi Raman and Sangeetha Sharma, Oxford University Press 2017.
6. **High School English Grammar & Composition** by Wren and Martin, S Chandh & Company Ltd – 2015.
7. **Effective Technical Communication** – Second Edition by M Ashraf Rizvi, McGraw Hill Education (India) Private Limited – 2018.
8. **Intermediate Grammar, Usage and Composition** by M.L.Tichoo, A.L.Subramanian, P.R.Subramanian, Orient Black Swan – 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

II Semester

ENVIRONMENTAL STUDIES			
Course Code	**21BS29**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	02:0:0:0	SEE Marks	50
Total Hours of Pedagogy	25	Total Marks	100
Credits	02	Exam Hours	02

Course objectives:

- Understand the repossession of ecosystems.
- To communicate about biodiversity, natural, cultural environment and good human health.
- Impart the knowledge inefficient material cycles and make free from dangerous substances
- Sustainable use of natural resources efficient energy use and patterns of consumptions.

Teaching-Learning Process (General Instructions) desert, wetlands, Riverine, Oceanic and Lake
These are sample Strategies, which group teachers can use to accelerate the attainment of the various course outcomes.

1. In addition to printing resources the knowledge in environmental concerns may be addressed through videos, animation of films.
2. Create and use Learner cantered approaches and resources.
3. Compare the objectives, concepts, and issues included in the syllabus.
4. State the importance of environmental knowledge for real life.
5. Encourage the students for group learning and group discussions which helps how to conserve and protect the environment.
6. Seminars and quizzes may be arranged for students which helps to improve analytical skills.

Module-1	**05 Hours**
Ecosystems (Structure and Function); Forest, Desert, Wetlands, Riverine, Oceanic and Lake. Biodiversity: Types, Value; Hot-spots, Threats and Conservation of biodiversity, Forest Wealth, and Deforestation.	
Teaching-Learning Process	Chalk and talk method, power point presentation.
Module-2	**05 Hours**
Advances in Energy Systems (Merits, Demerits, Global Status and Applications): Hydrogen, solar, OTEC, Tidal and Wind. **Natural Resource Management (**Concept and case-studies): Disaster Management, Sustainable Mining, Cloud Seeding and Carbon Trading.	
Teaching-Learning Process	Arrange practical visits to tidal and wind mills. For natural energy resource management chalk and talk method, power point presentation.
Module-3	**05 Hours**
Environmental Pollution (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies): surface and ground water pollution, Noise pollution, Soil pollution and Air pollution. **Waste Management & Public Health Aspects**: Bio-medical Wastes, Solid waste, Hazards wastes, E-Wastes, Industrial and Municipal Sludge.	
Teaching-Learning Process	Chalk and talk method, power point presentation.
Module-4	**05 Hours**

Global Environmental Concerns (concept, polices and case-studies): Ground water depletion/recharging. Climate Change, Acid rain, Ozone Deletion, Radon and Fluoride problem in drinking water, Resettlement and rehabilitation of people , Environment Toxicology.

Teaching-Learning Process	Field survey, Chalk and talk method, Power point presentation.

Module-5 05 Hours

Latest Development in Environmental Pollution Mitigation Tools (concept and applications): G.I.S.& Remote sensing Environment impact Assessment, Environmental Management Systems, ISO14001; Environmental Stewardship- NGOs

Field work: Visit to an Environmental Laboratory or Green Building or Water Treatment Plant or Waste water treatment Plant Ought to be followed by understanding of process and its brief documentation.

Teaching-Learning Process	Visit to remote sensing stations, water treatment plants and waste water treatment plants. Videos and power point presentation.

Course outcome (Course Skill Set)

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

1. Understand the principles of ecology and environmental issues that apply to air , land, and water issues on a global scale.
2. Develop critical thinking and /or observation skills and apply them to the analysis of a problem or question related to the environment.
3. Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components.
4. Apply their ecological knowledge to illustrate and graph a problem and describe the realistic that managers face when dealing with complex issues.

Assessment Details (both CIE and SEE)

(methods of CIE need to be define topic wise i.e.- MCQ, Quizzes, Open book test, Seminar or micro project)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain minimum of 40% marks individually both in CIE and SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (2 Hours duration). Based on this grading will be awarded.

Continuous Internal Evaluation:

1. Methods suggested: Test, Open Book test, Written Quiz, Seminar, report writing etc.
2. The class teacher has to decide the topic for closed book test, open book test, Written Quiz and Seminar. In the beginning only teacher has to announce the methods of CIE for the subject.

Semester End Examination:

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

1. The question paper will have 100 objective questions.
2. Each question will be for 01 mark.
3. The students will have to answer all the questions in OMR Sheet.
4. The duration of examination will be 02 hours.

Suggested Learning Resources:

Books

1. Text book of Environmental Studies by Benny Joseph 2nd Edition,2012 - Tata Mc. Graw-Hill
2. Text book of Environmental Studies by S.M.Prakash 3rd Edition 2018- Pristine Publishing House Mangalore.
3. Environmental Studies- From Crisis to Cure. By R.Rajagopalan 2005-Oxford Publisher.

Reference books

1. Principals of Environmental Science and Engineering by Raman Siva Kumar 2nd Edition –Cengage learning, Singapore
2. Environmental Science- working with the Earth by Tyler Miller.Jr 11th. Edition, 2006- Thomson Books/Cole.
3. Text Book of Environmental and Ecology by Pratiba Sing, Anoop Sing and Piyush Malaviya. 1st Edition- Acme Learning Pvt. Ltd. New Delhi.

Web links and Video Lectures (e-Resources):

- https://www.youtube.com/watch?v=3OJeRAjr19o&list=PLUdUqUu9KRUJuMXxpalSh70mj8y3xDmv
- https://www.youtube.com/watch?v=8Upv8RlqhOQ
- https://www.youtube.com/watch?v=9JSNcsLQ3DO&list=PLUdUqUu9KRUJuMXxpalSh70mj8y3xDmv&index=10
- https://www.youtube.com/watch?v=2b8yHAfs
- https://www.youtube.com/watch?vMCvil2GmMKc

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

https://www.pinterest.com>env

https://www.uwsp.edu>wcee

http://ntpel.ac.in

II Semester

UNIVERSAL HUMAN VALUES			
Course Code	**21UH29**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	02:0:0:0	SEE Marks	50
Total Hours of Pedagogy	25	Total Marks	100
Credits	02	Exam Hours	02

Course objectives:

- Understand the human values, work ethics, and accept challenges in workplace.
- To communicate about the need for education for life.
- Impart the knowledge on safety. Risk and responsibilities.
- Understandhuman rights and global issues.

Teaching-Learning Process (General Instructions)desert, wetlands, Riverine, Oceanic and Lake
These are sample Strategies, which for group teacher can use to accelerate the attainment of the various course outcomes.

1. In addition to printing resources the knowledge in human values and professional ethics may be addressed through videos, animation of films.
2. Create and use Learner centered approaches and resources.
3. Compare the objectives, concepts, and issues included in the syllabus.
4. State the importanceof human values for real life.
5. Encourage the students for group learning and group discussions which helps how to conserve and protect human values.
6. Seminars and quizzes may be arranged for students which helps to improve analytical skills.

Module-1	
Human Values : Objectives, Morals, Values, Ethics, Integrity, Work Ethics, Service Learnings, Virtues, Respect for others, Living Peacefully ,Caring, Sharing, Honesty, Courage, Valuing Time, Cooperation, Commitment, Empathy, Self Confidence, Challenges in work Place, Spirituality, Yoga for Professional Excellence and stress Management.	
Teaching-Learning Process	Chalk and talk method, power point presentation.
Module-2	
Value Education : Introduction,Education for Fulfilling Life,Value Education,Skill Education,Priority of Values over Skills, Implications of value Education(Correct identification of goals, Development of a Holistic Perspective,	
Teaching-Learning Process	Chalk and talk method, power point presentation. The teachers are expected to inform the students about values and skills to sustain happiness and prosperity
Module-3	

Safety and Responsibilities:Safety and Risk, Risk analysis, Assessment of Safety and Risk, Safe Exit,Risk benefit analysis, Safety Lessons from the Challenger , Collegiality and Loyalty, Collective Bargaining, Confidentiality,Conflicts And interest. Occupational Crimes.	
Teaching-Learning Process	Chalk and talk method, power point presentation.
Module-4	
Human Rights: Employee Rights,(Right to privacy, Right to choose outside activities ,Right to due process from Employer, Right to equal opportunity,Non-discrimination,), Intellectual Property Rights, (Intellectual Property, Need for protection of IP) Intellectual property norms(Patents, Copyright, Trademark, Trade secret).	
Teaching-Learning Process	Chalk and talk method, Power point presentation.
Module-5	
Global Issues: Globalisation, Multinational Corporations, Environmental Ethics, Computer Ethics, Weapons Development, Engineers as Advisors in planning and Policy Making, Moral leadership, codes of ethics ,Ethics and codes of ethics in MNC, Corporate Social Responsibility.	
Teaching-Learning Process	Visit to multinational corporations to know about corporate social responsibilities practically. Videos and power point presentation

Course outcome (Course Skill Set)

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

1. Understand the human values, work ethics, respect to others and stress management.
2. Develops a universal approach to value and skill education by understanding reality and holistic perspective.
3. Assess safety, risk, confidentiality and occupational crimes.
4. Understand numerous human rights.
5. Comprehend planning, policy making and corporate social responsibilities.

Assessment Details (both CIE and SEE)

(methods of CIE need to be define topic wise i.e.- MCQ, Quizzes, Open book test, Seminar or micro project)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain minimum of 40% marks individually both in CIE and SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (2 Hours duration). Based on this grading will be awarded.

Continuous Internal Evaluation:

1. Methods suggested: Test, Open Book test, Written Quiz, Seminar, report writing etc.
2. The class teacher has to decide the topic for closed book test, open book test, Written Quiz and Seminar.
3. In the beginning only teacher has to announce the methods of CIE for the subject.

Semester End Examination:

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

1. The question paper will have 100 objective questions.
2. Each question will be for 01 mark.
3. The students will have to answer all the questions in OMR Sheet.

Suggested Learning Resources:

Books

1. Human values by A.N.Tripaty New Age International publishers 2003.
2. A Text book on Professional Ethics and Human Values byR.S.Naagarazan 2 nd Edition New Age International Publishers.
3. Foundation of Ethics and Management by B.P, Banerjee. Excel Books.

Reference books

1. Science and Humanism by P.L.Dhar and R.R.Gaur Commonwealth Publishers.
2. Business Ethics by B.A.KarunakaraReddy.Pushpa.N and Archana. Vision Book House.
3. ManavaVyavaharaDarsana, JivanaVidyaPrakasana,Amarkantak by A.Nagaraj.
4. Human Capital Management by Chandrasekhar, Gurumurthy, Mahesh and Nagarthna M Malagi Phoenix Publishing House.

Web links and Video Lectures (e-Resources):

- https://www.uhv.org.in/
- https://aktu.uhv.org.in/
- https://www.storyofstuff.com/

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

Charlie Chaplin, Modern Times United Artists, USA.

IIT Delhi, Modern Technology-The Untold Story

Anand Gandhi Right Here Right Now.2003 Cyclewala Production. .