



Minutes of the Meeting

Board of Studies (BoS) Meeting held virtually on 14.08.2025 at 11.00 am

The following members are present in the meeting.

1	Dr. D. Indira Priyadarshini, Professor of English, VJIT.	Chairperson
2	Dr. N. V.S.N. Lakshmi, Associate Professor in English, JNTUH, UCESTH	JNTUH Nominee
3	Dr. G.V.S. Anantha Lakshmi, Professor in English, Anurag University, Hyderabad.	External Member
4	Dr. G. Suvarna Lakshmi, Professor in English, Deptt. of ELT, EFLU Hyderabad.	External Member
5	Dr. Raja Vishwanathan, Associate Professor in English, NIT Warangal.	External Member
6	Dr. M.G. Prasuna, Associate Professor in English, BITS Hyderabad.	External Member
7	Dr. V. Murali, Associate Professor in English, VJIT	Internal Member
8	Dr. R. Lalitha Bai, Associate Professor in English, VJIT	Internal Member
9	Dr. A. Surender, Associate Professor in English, VJIT	Internal Member
10	Mrs. J. Sree Devi, Associate Professor in English, VJIT	Internal Member
11	Mrs. K. Sree Vani, Assistant Professor in English, V JIT	Internal Member

The BoS meeting started with the Chairperson Dr.D.Indira Priyadarshini welcoming the members and presenting the ESE & ELCS syllabus.

Table 1

S.No.	Name of the Course	Year / Semester	Programme
1.	English for Skill Enhancement	I year I & II Semester	B.Tech (Common for all Branches)
2.	English Language and Communication Skills Laboratory	I year I & II Semester	B.Tech (Common for all Branches)

The following are the Resolutions:

Item No 1: Approval of B. Tech 1 yr English for Skill Enhancement & English Language and Communication Skills Laboratory Syllabus

The Chairperson of Board of Studies (BoS) presented the syllabus of English for Skill Enhancement & English Language and Communication Skills Laboratory meant for B. Tech I Year I & II Semesters.



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Suggestions:

1. Dr.N.V.S.N Lakshmi suggested to follow the recently updated JNTUH syllabus for ESE & ELCS Lab.
2. Dr. G. Suvama Lakshmi insisted on concentrating more on listening and speaking skills.
3. Dr. N.V.S.N Lakshmi emphasized on preparing handouts for grammar topics for the students for effective teaching/ learning in the classroom.

Noted and Approved.

Resolution (1):

The members after discussion approved the Syllabus of English for Skill Enhancement & English Language Communication Skills Laboratory offered to B.Tech. 1 yr I/II Semester students.

Noted and Approved

Resolution (2):

It is resolved unanimously to pay the remuneration to the examiners as approved by the BoG.

Noted and approved

Sl No	Name of Members	Designation	Signature
1	Dr. D. Indira Priyadarshini, Professor of English, VJIT.	Chairperson	
2	Dr. N.V.S.N. Lakshmi, Associate Professor in English, JNTUH, UCESTH	Member, JNTUH Nominee	14/8/2015
3	Dr. G.V.S. Anantha Lakshmi, Professor in English, Anurag University, Hyderabad.	External Member	
4	Dr. G. Suvama Lakshmi, Professor in English, Deptt. of ELT, EFLU Hyderabad.	External Member	
5	Dr. Raja Vishwanathan, Associate Professor in English, NIT Warangal.	External Member	M.R. Vishwanathan
6	Dr. M.G. Prasuna, Associate Professor in English, BITS Hyderabad.	Internal Member	M.G. Prasuna
7	Dr. V. Murali, Associate Professor in English, VJIT	Internal Member	
8	Dr. R. Lalitha Bai, Associate Professor in English, VJIT	Internal Member	
9	Dr. A. Surender, Associate Professor in English, VJIT	Internal Member	
10	Mrs. J. Sree Devi, Associate Professor in English, VJIT	Internal Member	
11	Mrs. K. Sree Vani, Assistant Professor in English, VJIT	Internal Member	



Proces No: VJIT/Pri.Off/Mathematics-BoS/55/2025-26

Date: 12-08-2025

OFFICE ORDER

The College Administration is pleased to reconstitute the Board of Studies (BoS) Committee for Mathematics, with effect from 12th August 2025, with the following members.

S. No.	Name of the Member	Designation
1	Dr. K. Lakshmi Narayan, Professor of Mathematics, VJIT, Hyderabad	Chairman
2	Dr. B. Ravindra Reddy, Professor of Mathematics, JNTUH UCESTH.	JNTUH Nominee
3	Dr. P. Anantha Lakshmi Narayana, Professor, IIT, Hyderabad	External Member
4	Dr. V. Nagaraju, Professor of Mathematics, CoSc, O.U, Hyderabad.	External Member
5	Mr. Sunil Kumar Tata, Scientist F, DRDL, Hyderabad	External Member
6	Dr. P. Suresh, Sr. Asst. Professor of Mathematics, CBIT, Hyderabad	External Member
7	Mrs. G. Srilatha, Associate Professor of Mathematics, VJIT, Hyderabad	Internal Member
8	Dr. S. Sivaiah, Professor of Mathematics, VJIT	Internal Member
9	Dr. R. Ramakrishna, Professor of Mathematics, VJIT	Internal Member
10	Dr. K. Kondala Rao, Associate Professor of Mathematics, VJIT	Internal Member
11	Dr. K. Madhusudana Reddy, Associate Professor of Mathematics, VJIT	Internal Member
12	Dr. M. N. L. Anuradha, , Associate Professor of Mathematics, VJIT	Internal Member
13	Mr. J. Govardhan Reddy, Associate Professor of Mathematics, VJIT	Internal Member

- The above members of the Board of studies shall hold the office until further orders with effect from the date of issue of this order.
- The members attending the meeting of the Board of Studies are eligible for T.A. and D.A. as per the rules of the Institutions in force.
- The members are also requested to intimate this office in case of any change in their address and designation.


PRINCIPAL

Copy to:
All the Members



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INSTITUTE OF TECHNOLOGY
AN AUTONOMOUS INSTITUTION

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**Minutes of Board of Studies (BoS) Meeting held on
14th August 2025**

Members present:

S.No	Name of the Member	Designation	Signature
1.	Dr. K. Lakshmi Narayan	Chairman	
2.	Dr. B. Ravindra Reddy	JNTUH Nominee	
3.	Dr. P. Anantha Lakshmi Narayana	External Member	
4.	Dr. V. Nagaraju	External Member	
5.	Mr. Sunil Kumar Tata	External Member	
6.	Dr. P. Suresh	External Member	
7.	Mrs. G. Srilatha	Internal Member	
8.	Dr. S. Sivaiah	Internal Member	
9.	Dr. R. Ramakrishna	Internal Member	
10.	Dr. K. Kondala Rao	Internal Member	
11.	Dr. K. Madhusudana Reddy	Internal Member	
12.	Dr. M. N. L. Anuradha	Internal Member	
13.	Mr. J. Govardhan Reddy	Internal Member	

Approval of B Tech I, II and II year syllabus:

The Chairman of Board of Studies (BOS) presented the syllabi of following subjects

Table 1:

S. No	Name of the Course	Year/Semester	Programme
1	Mathematics-I	I year I Semester	B. Tech all branches
2	Mathematics-II	I year II Semester	B. Tech All Branches
3	Mathematics-III	II Year I/II Semester	B Tech EEE, ECE
4	Probability & Statistics	II Year I/II Semester	B Tech CE, ME, CSE, IT, CSE(AI&ML) CSE(DS)
5	Quantitative Methods & Logical Reasoning	II Year I/II Semester	B. Tech all branches
6	Numerical Methods for Engineers	III Year II Semester	B Tech all branches (Open Elective)
7	Computational Mathematics Lab	II Year I/II Semester	B. Tech all branches

After discussing various aspects of the syllabi, the committee passed the following resolutions.

Resolutions 1: The members after thorough discussion, approved the syllabi of above course mentioned in Table: 1. And the syllabi is as per Annexure 1.

Noted and Approved

Resolutions 2: It is resolved unanimously to pay the remuneration to the examiners as approved by the BOG

Noted and Approved.

Signature of the members present:

1) Karagey

2) Arun

3) Shishir

4) Vignesh

5) Anil

6) Ramesh

7) G. V. S.

8) S. S. V. S.

9) R. Ramesh

10) K. S. S.

11) K. S. S.

12) A.

13) S. S. S.



Vidya Jyothi Institute of Technology (Autonomous)

(Accredited by NAAC, Approved By A.I.C.T.E., New Delhi, Permanently Affiliated to JNTU, Hyderabad)

(Aziz Nagar, C.B.Post, Hyderabad -500075)

Annexure I

TITLE: Mathematics-I (Matrices and Calculus) (Common to All)

I Year, I Semester

L	T	P	C
3	1	0	4

Pre-requisites: Mathematical Knowledge at pre-university level

Objectives: To learn

1. Applying basic operations on matrices and their properties.
2. Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
3. Concept of eigen values and eigen vectors and to reduce the quadratic form to canonical form
4. Geometrical approach to the mean value theorems and their application to the mathematical problems
5. Finding maxima and minima of functions of two and three variables.
6. Evaluation of multiple integrals and their applications.

Course outcomes: After learning the contents of this paper, the student must be able to

1. Formulate the matrix representation of a given set of linear equations and analyze the solution of the system using appropriate methods.
2. Compute the eigenvalues and determine the corresponding eigenvectors of a given matrix.
3. Transform a quadratic form into its canonical form using orthogonal transformations.
4. Apply the mean value theorems to solve real-world and mathematical problems.
5. Determine the extreme values of functions of two variables with and without constraints.
6. Evaluate multiple integrals and apply them to calculate areas and volumes.

UNIT-I: Matrices

Rank of a matrix by Echelon form and Normal form — Inverse of Non-singular matrices by Gauss-Jordan method. System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations.

UNIT-II: Eigen values and Eigen vectors

Linear Transformation and Orthogonal Transformation: Eigen values — Eigen vectors and their properties — Diagonalization of a matrix — Cayley-Hamilton Theorem (without proof) — Finding inverse and power of a matrix by Cayley-Hamilton Theorem. Quadratic forms and Nature of the Quadratic Forms — Reduction of Quadratic form to canonical form by Orthogonal Transformation.

- 1) Harooye
- 2) Vrus
- 3) Gue
- 4) Bond
- 5) eaddy

- 6) m
- 7) H
- 8) S. S. V. A.
- 9) K. K. S. S.

- 10) P. K. S. S.
- 11) P. K. S. S.
- 12) R. R. S. S.

UNIT-III: Single Variable Calculus

Limit and Continuous of functions and its properties. Mean value theorems: Rolle's theorem — Lagrange's Mean value theorem with their Geometrical Interpretation and applications — Cauchy's Mean value Theorem — Taylor's Series (All the theorems without proof).

Curve Tracing: Curve tracing in Cartesian coordinates.

UNIT-IV: Multivariable Calculus (Partial Differentiation and applications)

Definitions of Limit and continuity — Partial Differentiation: Total derivative — Jacobian — Functional dependence & independence. Applications: Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V: Multivariable Calculus (Integration)

Evaluation of Double Integrals (Cartesian and polar coordinates) — change of order of integration (only Cartesian form) — Change of variables for double integrals (Cartesian to polar). Evaluation of Triple Integrals — Change of variables for triple integrals (Cartesian to Spherical and Cylindrical polar coordinates).

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Edition, 2016.

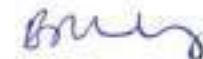
REFERENCE BOOKS:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

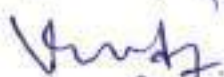
Signatures of the Members

The above syllabus is approved

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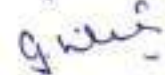
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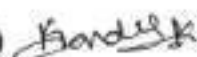
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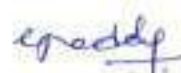
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9) R. Rama Krishna

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Annexure I

TITLE: Mathematics II (Ordinary Differential Equations and Vector Calculus) (Common to All)

I Year, II Semester

L	T	P	C
3	0	0	3

Pre-requisites: Mathematical Knowledge at pre-university level

Course Objectives: To learn

1. Methods of solving the differential equations of first and higher order.
2. Concept, properties of Laplace transforms.
3. Solving ordinary differential equations using Laplace transforms techniques.
4. The physical quantities involved in engineering field related to vector valued functions
5. The basic properties of vector valued functions and their applications to line, surface and volume integrals

Course outcomes: After learning the contents of this paper, the student must be able to

1. Apply the concept of first order differential equations to solve real world problems
2. Solve higher differential equation and apply the concept of differential equation to real world problems.
3. Use the Laplace Transforms techniques for solving Ordinary Differential Equations.
4. Apply the concepts of vector differentiation to compute gradient, divergence, and curl, and interpret their physical significance in engineering problems.
5. Evaluate line, surface, and volume integrals, and apply vector integration theorems such as Green's, Gauss's, and Stokes's to solve engineering problems.

UNIT-I: First Order Ordinary Differential Equations

Exact differential equations – Equations reducible to exact differential equations – linear and Bernoulli's equations – Orthogonal Trajectories (only in Cartesian Coordinates). Applications: Newton's law of cooling – Law of natural growth and decay.

UNIT-II: Ordinary Differential Equations of Higher Order

Higher order linear differential equations with constant coefficients: Non-Homogeneous terms of the type e^{ax} , $\sin ax$, $\cos ax$, polynomials in x , $e^{ax}V(x)$ and $xV(x)$ – Method of variation of parameters.

1) Karayy

2) Anurag

3) Shrestha

4) Vignesh

5) G. S. S.

6) S. S.

7) Gilesh

8) S. S. V. S.

9) R. Ramesh Krishna

10) K. S. S.

11) S. S. S.

12) N.

13) S. S. S.

UNIT-III: Laplace Transforms

Laplace Transforms: Laplace Transform of standard functions — First and second shifting theorems — Laplace transforms of functions multiplied by 't' and divided by 't' — Laplace transforms of derivatives and integrals of function — Evaluation of integrals by Laplace transforms — Laplace transform of periodic functions — Inverse Laplace transform by different methods, convolution theorem (without proof). Applications: solving Initial value problems by Laplace Transform method.

UNIT-IV: Vector Differentiation

Vector point functions and scalar point functions — Gradient — Directional derivatives — Divergence — Solenoidal Vector — Curl — Irrotational vectors — Vector Identities.

UNIT-V: Vector Integration

Line, Surface and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications

TEXT BOOKS:

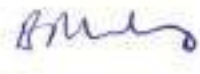
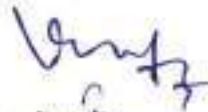
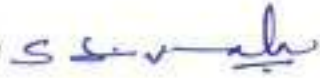
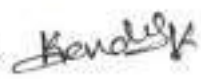
1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Edition, 2016.

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1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
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3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

Signatures of the Members

The above syllabus is approved

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|---|---|---|
| 1)  | 2)  | 3)  |
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Annexure I

TITLE: MATHEMATICS-III (NUMERICAL METHODS & COMPLEX VARIABLES) (I SEMESTER forEEE& II Semester for ECE)

II year I/II Semester

L	T	P	C
3	0	0	3

Pre-requisites: Mathematics courses of first year of study.

Objectives: To learn

- Various numerical methods to find roots of polynomial and transcendental equations.
- Concept of finite differences and to estimate the value for the given data using interpolation.
- Evaluation of integrals using numerical techniques
- Solving ordinary differential equations of first order using numerical techniques.
- Differentiation and integration of complex valued functions.
- Evaluation of integrals using Cauchy's integral formula and Cauchy's residue theorem.
- Expansion of complex functions using Taylor's and Laurent's series.

Course Outcomes: After learning the contents of this course the students must be able to:

- Apply the Knowledge to find the root of a given polynomial and transcendental equations.
- Estimate the value for the given data using interpolation
- Solve the given first order ODE's using Numerical Techniques
- Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
- Expand the complex functions using Taylor's and Laurent's series expansions.

Syllabus:

UNIT-I: Numerical Methods-I: (Algebraic and Transcendental Equations)

Solution of polynomial and transcendental equations: Bisection method, Iteration Method, Newton-Raphson method and Regula-Falsi method. Jacobi and Gauss-Seidal iteration methods for solving linear systems of equations.

UNIT-II: Numerical Methods-II (Interpolation&Numerical Integration)

Finite differences: forward differences, backward differences, central differences, symbolic relations and separation of symbols, Interpolation using Newton's forward and backward difference formulae. Central difference interpolation: Gauss's forward and backward formulae, Lagrange's method of interpolation.

Numerical integration: Trapezoidal rule and Simpson's $1/3^{\text{rd}}$ and $3/8^{\text{th}}$ rules.

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- 9) R. Rama Krishna
- 12)

UNIT-III: Numerical Methods-III (Solutions of Initial Value Problems)

Solutions of Ordinary differential equations: Taylor's series, Picard's method, Euler and modified Euler's methods, Runge-Kutta method of second and fourth order for first order

UNIT-IV:Complex Analysis-I(Function of Complex Variables and Differentiation)

Introduction, Complex functions - limits and Continuity-Differentiability, Analytic functions and Properties, Cauchy-Riemann Equations (Cartesian and Polar), Harmonic functions, Construction of analytic functions.(All theorems without Proofs).

UNIT-V:

UNIT-V: Complex Integration:

Introduction, Complex integration-Line integral, Cauchy's integral theorem, Cauchy's integral formula, Generalized Cauchy's integral formula, Power series: Taylor's series, Laurent series, Singular points, Types of Singularities, Residue, Cauchy's Residue theorem.(All theorems without Proofs)

Textbooks:

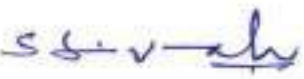
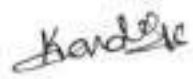
1. Higher Engineering Mathematics by Dr. B. S. Grewal, Khanna Publishers.
2. Introductory methods of numerical analysis 2005. by S. S. Sastry, , PHI, 4th Edition.

Reference Books:

1. Advanced Engineering Mathematics : Kreyszig, John Wiley & sons
2. Numerical methods for Scientific and Engineering Computations, by M. K. Jain, S. R. K. Iyengar, R. K. Jain, New Age International publishers.
3. Functions of Complex Variables by J.N.Sharma, Krishna Prakashan Media.

Signatures of the Members

The above syllabus is approved

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|---|---|---|
| 1)  | 2)  | 3)  |
| 4)  | 5)  | 6)  |
| 7)  | 8)  | 9) R. Rama Krishna |
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Annexure I

TITLE: PROBABILITY AND STATISTICS

(Common for CIVIL, MECH, CSE, IT, CSE(AI&ML) &CSE(DS))

II Year I/II Semester

L	T	P	C
3	0	0	3

Pre-requisites: Mathematics courses of first year of study.

Course Objectives:

1. To learn random variables that describe randomness or an uncertainty in certain realistic situation
2. To learn Binomial geometric and normal distributions
3. To learn Sampling distribution of mean, variance, point estimation and interval estimation and the testing of hypothesis and ANOVA
4. By using correlation to identify the strength and direction of a linear relationship between two variables and using regression to predict how much a dependent variable changes based on adjustments to an independent variable, you are empowered to make objective, data-driven decisions regarding your processes.
5. To fit a desired curve by the method of least squares for the given data

Course Outcomes: After learning the contents of this course the students must be able to:

1. Apply the concepts of probability and random variables to analyze and model uncertainty in engineering and real-world problems.
2. Evaluate and interpret probability distributions to solve problems in engineering and applied sciences.
3. Acquire elementary knowledge of parametric and non parametric –tests and understand the use of observing state analysis for predicting future conditions.
4. Identify and examine situations that generate using problems and able to solve the tests of ANOVA for classified data.
5. Compute correlation coefficients, perform regression analysis, and apply curve fitting techniques to interpret relationships between variables.

Syllabus:

UNIT-I: PROBABILITY AND RANDOM VARIABLES:

PROBABILITY: Introduction- Sample space and events- probability. The axioms of probability- some elementary theorems-conditional probability- Bayes's Theorem-

RANDOM VARIABLES: Random variable, Discrete and continuous. Probability distributions, mass function/ density function of a probability distribution.

- 1) Karan
- 2) Arun
- 3) Aris
- 4) Vignesh
- 5) Anand
- 6) Arun
- 7) Gaurav
- 8) Srujan
- 9) R. Rame Krishna
- 10) Sandeep
- 11) K. Rame Krishna
- 12) Arun
- 13) Gaurav

- 2) Arun
- 5) Anand
- 8) Srujan
- 11) K. Rame Krishna

- 3) Aris
- 6) Arun
- 9) R. Rame Krishna
- 12) Arun

UNIT-II: PROBABILITY DISTRIBUTIONS:

Fitting of Binomial, Poisson & Normal distributions and their properties (only Statements) Moment

* Generating Functions of the above three distributions and hence finding the mean and variance.

UNIT-III: SAMPLING THEORY & TESTING OF HYPOTHESIS I:

Sampling Distribution: Definition of Sample, Population, and Types of Sampling. Estimation-Point estimation, Interval estimation.

Testing of Hypothesis: Null hypothesis – Alternative hypothesis, Type I, & Type II errors – critical region confidence interval for mean, Testing of hypothesis for single mean and difference between the means for large samples. Confidence interval for the proportions, Tests of hypothesis for the proportions- single and difference between the proportions for large samples

UNIT-IV: TESTING OF HYPOTHESIS II:

Small Samples - t-distribution, F-Distribution, χ^2 distribution, ANOVA for one-way classified data

UNIT-V: CORRELATION, REGRESSION & CURVE FITTING:

Correlation and Regression: Coefficient of Correlation-Regression coefficients- The lines of Regression- The Coefficient of Rank Correlation.

Curve Fitting: Fitting a Straight line – Second Degree Polynomials – Exponential and Power Curve by the Method of Least Squares.

TEXT BOOKS

1. Probability and Statistics for Engineers, by Richard Arnold Johnson, Irvin Miller and John E Freund, New Delhi Prentice Hall.
2. Probability and Statistics, by T. K. V. Iyengar others, S. Chand Publications
3. Introduction to Probability & Statistics for Engineers and Scientists by Sheldon M. Ross

References Books:

1. Fundamentals of Mathematical Statistics, by S C Gupta and V K Kapoor, S Chand.
2. Mathematics for Engineers and Scientists, by Alan Jeffrey, sixth edition, CRC press.

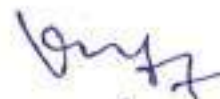
Signatures of the Members

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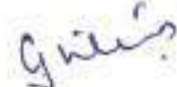
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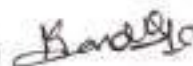
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9) R. Rama Krishna

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Annexure I

TITLE: QUANTITATIVE METHODS & LOGICAL REASONING (Common for All)

II year I/II Semester

L	T	P	C
2	0	0	1

Pre-requisites: Mathematics courses of first year of study.

Objectives: To learn

- To enhance the problem –solving skills in the areas of ‘Quantitative Aptitude’ and ‘Reasoning’ which will enable the students to better preparation for campus placements and competitive examinations.
- To improve the logical thinking and mathematical ability of the students

Course Outcomes: After learning the contents of this course the students must be able to:

- To perform well in various competitive exams and placement drives.
- To solve basic and complex mathematical problems in short time.
- To become strong in Quantitative Aptitude and Reasoning which can be applied for GRE, GATE, GMAT or CAT exams also.
- To develop problem solving skills and analytical abilities, which play a great role in corporate and industry set up.

Syllabus:

Unit- I:

- Number System:** Simplification, Types of Numbers, Factors, LCM & HCF, Divisibility Rules, Finding Unit Place Digit and Last Two Digits of an Expression

Unit- II:

- Ratio, Proportion and Variations:** Definition of Ratio, Ratio of Proportion, Comparison of Ratios, Compound ratio, Direct and Indirect Proportion
- Partnership:** Relation between Partners, Period of Investment and Shares.

Unit- II:

- Series completion:** Number series, Alphabet series, Letter Series.
- Analogy:** Number, Letter, Word
- Classification:** Number, Letter, Word

1) Hanayy
4) Vnt
7) Green
10) Bandele
13) Ereddy

2) Ramesh
5) H
8) S. V. Reddy
11) H. Reddy

3) R. Rama Krishna
6) R. Rama Krishna
9) R. Rama Krishna
12) R. Rama Krishna

Unit- IV:

- **Coding and Decoding:** Letter coding, Number coding, Number to letter coding, Matrix Coding, Substitution, Mixed Letter Coding, Mixed Number Coding, Deciphering Individual Letter Codes by Analysis.
- **Direction sense Test:** Sort of directions in puzzles distance between two points, problems on shadows, Application of triangular triplets.
- **Blood Relations:** Defining the various Relations among the Members of a Family, Solving Blood Relation Puzzles by using Symbols and Notations. Problems on Coded Relations.

Unit- V:

- **Permutation and Combination:** Fundamental Rules, Problems on Permutations & combinations.
- **Probability:** Definition of probability, Notations and Formulae, Problems on Probability.

Text Books:

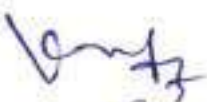
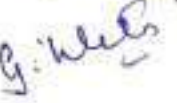
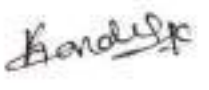
1. Verbal Reasoning, G.L. Barrons, Pinterest, Latest Edition 2019
2. A Modern Approach to Logical Reasoning & Quantitative Aptitude, R S Agarwal, S. Chand, Publications, Revised edition, 2019

Reference Books:

1. Quantitative Aptitude, G.L. Barrons, Pinrest 2019
2. Quantitative Aptitude, Abhijit Guha, Mc Graw Hills, Edition 2019
3. Quantitative Aptitude, U. Mohan Rao SCITECH

Signatures of the Members

The above syllabus is approved

- | | | |
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| 7)  | 8)  | 9) R. Rama Krishna |
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Annexure I

TITLE: Numerical Methods for Engineers (Open Elective)

III Year II Semester

L	T	P	C
3	0	0	3

Pre-requisites: Mathematics courses in first two years of study

Objectives: To learn

1. The importance of numerical methods.
2. Identifying the root of an equation geometrically and finding its approximate value by different techniques.
3. The concept of interpolation and fitting a interpolating polynomial.
4. Finding the derivatives and proper integrals of given functions using finite differences.
5. Fitting linear, non- linear and exponential curves for the given data by the method of least squares.

Solving boundary value problems involving PDE's using finite difference methods.

Course Outcomes: After learning the contents of this course the students must be able to:

1. Determine improved approximate roots of given algebraic and transcendental equations using numerical methods.
2. Solve systems of linear equations using appropriate numerical techniques.
3. Compute finite difference operators and estimate missing terms in a given dataset or the dependent variable for a given independent variable.
4. Evaluate derivatives at specified points and calculate definite integrals of functions using numerical methods.
5. Solve initial value problems and implement predictor-corrector methods for numerical solutions of differential equations.

Syllabus

UNIT-I: Solution of Algebraic, Transcendental Equations and System of Linear Equations

Bisection method, Regula-Falsi method, Iteration method, Newton - Raphson method. Iterative methods of solution of system of equations: Jacobi's iteration method, Gauss-Seidel iteration method.

UNIT-II: Interpolation

Finite differences: Forward, Backward and Central differences, Other difference operators and relations between them, Differences of a polynomial, Missing terms, Newton's interpolation formulae, Central difference interpolation formulae: Gauss's forward and backward interpolation formulae, Interpolation with unequal intervals: Lagrange's interpolation formula.

1) Karayy

2) Anurag

3) Shreejith

4) Vignesh

5) Anurag

6) Shreejith

7) Gaurav

8) S. S. V. S. V.

9) R. Rama Krishna

10) Karan

11) Shreejith

12) Shreejith

13) Gaurav

UNIT-III: Numerical Differentiation, Integration

Numerical differentiation: Derivatives using Newton's interpolation formulae. Numerical integration: Newton-cotes quadrature formula, Trapezoidal rule, Simpson's 1/3rd and 3/8th rule.

UNIT-IV: Numerical Solution of Ordinary Differential Equations of First Order

Taylor's series method, Picard's method, Euler's and modified Euler's Method, Runge-Kutta method of fourth order, Predictor and Corrector methods: Milne's method, Adams-Bashforth-Moulton method.

UNIT- V: Curve fitting

Method of least squares, Fitting a straight line, Second degree parabola and Non-linear curves of the form $y = ae^{bx}$, $y = ab^x$, $y = ax^b$ by the method of least squares.

Text Books

1. S. S. Sastry, Introductory Methods of Numerical Analysis, Fifth Edition, PHI Learning Pvt. Ltd, New Delhi, 2012.
2. M K Jain and S R K Iyengar, Numerical Methods for Scientific and Engineering Computation, 5th Edition, New Age International Publishers, New Delhi, 2007.
3. T K V Iyengar, B Krishna Gandhi & Others, Numerical Methods, Second Revised Edition, New Delhi, S.Chand & Co. Ltd, 2013.

Reference Books

Signatures of the Members

The above syllabus is approved

1) Karayya

2) Anurag

3) Shriya

4) Vignesh

5) S. S. S. S.

6) S. S. S. S.

7) G. S. S. S.

8) S. S. S. S.

9) R. Rama Krishna

10) S. S. S. S.

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Annexure I

TITLE: COMPUTATIONAL MATHEMATICS LAB (Common for All Branches)

II year I/II Semester

L	T	P	C
0	0	2	1

Course Objectives: To learn

1. Solve problems of Eigenvalues and Eigen Vectors using Python/MATLAB.
2. Solution of Algebraic and Transcendental Equations using Python/MATLAB
3. Solve problems of Linear system of equations
4. Solve problems of First-Order ODEs Higher order linear differential equations with constant coefficients

Course outcomes: After learning the contents of this paper, the student must be able to

1. Develop the code to find the Eigenvalues and Eigen Vectors using Python/MATLAB.
2. Develop the code find solution of Algebraic and Transcendental Equations and Linear system of equations using Python/MATLAB
3. Write the code to solve problems of First-Order ODEs Higher order linear differential equations with constant coefficients

Syllabus:

*Visualize all solutions Graphically through programmes

UNIT-I: Eigenvalues and Eigenvectors:

6P

Programs:

- Finding real and complex Eigenvalues.
- Finding Eigenvectors.

UNIT-II: Solution of Algebraic and Transcendental Equations

6P

Bisection method, Newton Raphson Method

Programs:

- Root of a given equation using Bisection method.
- Root of a given equation Newton Raphson Method.

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UNIT-III: Linear system of equations:

6P

Jacobi's iteration method and Gauss-Seidal iteration method

Programs:

- Solution of given system of linear equations using Jacobi's method
- Solution of given system of linear equations using Gauss-Seidal method

UNIT-IV: First-Order ODEs

8P

Exact and non-exact equations, Applications: exponential growth/decay, Newton's law of cooling.

Programs:

- Solving exact and non-exact equations
- Solving exponential growth/decay and Newton's law of cooling problems

UNIT-V: Higher order linear differential equations with constant coefficients

6P Programs:

- Solving homogeneous ODEs
- Solving non-homogeneous ODEs

TEXTBOOKS:

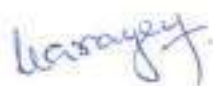
1. MATLAB and its Applications in Engineering, Rajkumar Basal, Ashok Kumar Geo, Manoj Kumar Sharma, Pearson publication.
2. Kenneth A. Lambert, The fundamentals of Python: First Programs, 2011, Cengage Learnings.
3. Think Python First Edition, by Allen B. Downey, Orielly publishing.
4. Introduction to Python Programming, William Mitchell, Pavel Solin, Martin Novak et al., NCLab Public Computing, 2012.
5. Introduction to Python Programming, © Jacob Fredslund, 2007.

REFERENCE BOOKS:

1. An Introduction to Python, John C. Luth, The University of Alabama, 2011.
2. Introduction to Python, © Dave Kuhlman, 2008.

Signatures of the Members

The above syllabus is approved

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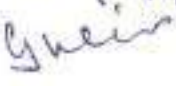
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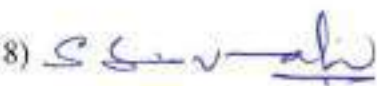
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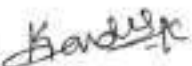
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Proces No: VJIT/Pri.Off/Chemistry-BoS/57/2025-26

Date: 12-08-2025

OFFICE ORDER

The College Administration is pleased to reconstitute the Board of Studies (BoS) Committee for Chemistry, with effect from 12th August 2025, with the following members.

S.No.	Name of the Member	Designation
1	Mrs .P. Annapurna, Assoc. Prof, Dept. of Chemistry, VJIT, Hyderabad	Chairman
2	Dr. K. Vidya, Assoc. Prof., Dept. of Chemistry, JNTUH UCESTH	JNTUH Nominee
3	Dr AVSS Prasad Vice President & Head , Shilpa Pharma Life Sciences	External Member
4	Prof. P. Venugopal,, Dept. of Chemistry, VCE, Hyd.	External Member
5	Prof. M. Ravichandar, Dept. of Chemistry, MGIT, Hyd.	External Member
6	Prof. E. Laxminarayana, Dept. of Chemistry, SNIST, Hyd.	External Member
7	Dr. P. Ramya Sudha, Asst. Prof, Dept. of Chemistry, VJIT, Hyd.	Internal Member
8	Dr. V. Rajender, Asst. Prof., Dept. of Chemistry, VJIT, Hyd.	Internal Member
9	Dr. R. Rohini, Asst. Prof, Dept. of Chemistry, VJIT, Hyd.	Internal Member
10	Dr. S.P. Lavanya, Asst. Prof, Dept. of Chemistry, VJIT, Hyd.	Internal Member
11	Mr .R. Muralidhar Reddy, Asst. Prof, Dept. of Chemistry, VJIT, Hyd.	Internal Member

- The above members of the Board of studies shall hold the office until further orders with effect from the date of issue of this order.
- The members attending the meeting of the Board of Studies are eligible for T.A. and D.A. as per the rules of the Institutions in force.
- The members are also requested to intimate this office in case of any change in their address and designation.


PRINCIPAL

Copy to:
All the Members



**Minutes of the Board of studies in Chemistry meeting held on
16-08-2025 at 11:00AM in the online mode**

The following members were present in the meeting.

S.No	Name of the Member	Designation	Signature
1.	Mrs. P. Annapurna, Head of the Dept. Chemistry, VJIT	Chairman	AR
2.	Dr. K. Vidya, Asso. Prof., Dept of Chemistry, JNTUH UCETH	JNTUH Nominee	K. Vidya
3.	Dr AVSS Prasad Vice President & Head , Shilpa Pharma Life Sciences	Industry Member	avss. prasad.
4.	Prof. P. Venugopal,, Dept of Chemistry, VCE, Hyd.	External Member	P. Venugopal
5.	Prof. M. Ravichandar, , Dept of Chemistry, MGIT, Hyd	External Member	M. Ravichandar
6.	Prof. E. Laxminarayana, Dept of Chemistry SNIST, Hyd.	External Member	E. Laxminarayana
7.	Dr. P. Ramya Sudha, Asst. Prof, Dept of Chemistry, VJIT, Hyd.	Internal Member	P. Ramya Sudha
8.	Dr. V. Rajender, Asst.Prof, Dept of Chemistry, VJIT, Hyd.	Internal Member	V. Rajender
9.	Dr. R. Rohini, Asst. Prof, Dept of Chemistry, VJIT, Hyd.	Internal Member	R. Rohini
10.	Dr. S.P. Lavanya, Asst. Prof, Dept of Chemistry, VJIT, Hyd.	Internal Member	S.P. Lavanya
11.	Mr .R. Muralidhar Reddy, Asst. Prof, Dept of Chemistry, VJIT, Hyd.	Internal Member	R. Muralidhar Reddy

Table1:

S. No.	Name of the Course	Year/Semester	Programme
1	Engineering Chemistry	I year I / II semester	B.Tech all branches
2	Engineering Chemistry Lab	I year I / II semester	B.Tech all branches
5	Nutritional & Biological chemistry	III year II semester	B.Tech all branches (Open Elective)

After discussing various aspects of the syllabi, the committee passed the following resolutions.

Resolutions

Resolution1: The members after thorough discussion, approved the syllabi of above course mentioned in table1.

And the syllabi is as per Annexure 1, Annexure 2, and Annexure 3.

Noted and Approved

Resolution2: . It is resolved unanimously to pay the remuneration to the examiners as approved by the BOG.

Noted and Approved.

Signatures of the Members Present:

1. AR

2. Vidya

3. J. V. Prasad

4. A. S. R. Reddy

5. P. K. S. Reddy

6. S. S. Reddy

7. P. S. Reddy

8. V. S. Reddy

9. Rohini

10. S. S. Reddy

11. S. S. Reddy



ANNEXURE-I
ENGINEERING CHEMISTRY

L	T	P	C
3	0	0	3

B.Tech. I Year

Course Objectives:

1. To understand the industrial significance of water treatment, fundamental principles of battery chemistry, and the impact of corrosion along with its control methods for structural protection.
2. To impart foundational knowledge of various energy sources and their practical applications in engineering.
3. To equip students with an understanding of biosensors, and analytical techniques applicable in engineering, industrial, environmental, and biomedical fields.

Course Outcomes:

1. **Identify and explain** the fundamental properties of water and its applications in domestic and industrial systems.
2. **Describe** the principles of electrochemical processes and **demonstrate** basic methods of corrosion prevention.
3. **Explain** the working of batteries and energy sources and **analyze** their relevance in engineering and entrepreneurial applications.
4. **Define and classify** polymers and other engineering materials based on their structure, properties, and applications.
5. **Apply** the principles of material properties and **analyze** analytical techniques for engineering and environmental problem-solving.

UNIT-I: Water and its treatment: [8]

Introduction- Hardness, types, degree of hardness and units. Estimation of hardness of water by complexometric method - Numerical problems. Potable water and its specifications (WHO) - Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and breakpoint chlorination. Defluoridation - Nalgonda technique. Boiler troubles: Scales, Sludges and Caustic embrittlement. Internal treatment of boiler feed water - Calgon conditioning, Phosphate conditioning, Colloidal conditioning. External treatment methods - Softening of water by ion- exchange processes. Desalination of brackish water - Reverse osmosis.

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UNIT-II: Electrochemistry and Corrosion: [8]

Introduction- Electrode potential, standard electrode potential, Nernst equation (no derivation), electrochemical cell - Galvanic cell, cell representation, EMF of cell - Numerical problems. Types of electrodes, reference electrodes - Primary reference electrode - Standard Hydrogen Electrode (SHE), Secondary reference electrode - Calomel electrode. Construction, working and determination of pH of unknown solution using SHE, Quinhydrone electrode and Calomel electrode.

Corrosion: Introduction- Definition, causes and effects of corrosion - Theories of corrosion, chemical and electrochemical theories of corrosion, Types of corrosion: galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion - Nature of the metal (Position of metal in galvanic series, Purity of metal, Nature of corrosion product), Nature of the corroding environment (Temperature, Humidity, and pH). Corrosion control methods - Cathodic protection Methods - Sacrificial anode and impressed current methods.

UNIT-III: Energy sources: [8]

Batteries: Introduction - Classification of batteries - Primary, secondary and reserve batteries with examples. Construction, working and applications of Zn-air and Lithium ion battery. Fuel Cells - Differences between a battery and a fuel cell, Construction and applications of Direct Methanol Fuel Cell (DMFC).

Fuels: Introduction, classification and characteristics of a good fuel, Calorific value - Units - HCV, LCV- Dulong's formula - Numerical problems.

Fossil fuels: Introduction, Petroleum - Refining of Crude oil, Cracking - Types of cracking - Moving bed catalytic cracking. LPG and CNG composition and uses.

Synthetic Fuels: Fischer-Tropsch process, Introduction and applications of Hythane and Green Hydrogen.

UNIT - IV: Polymers: [8]

Definition - Classification of polymers: Based on origin and tacticity with examples - Types of polymerization - Addition (free radical addition mechanism) and condensation polymerization. Plastics, Elastomers and Fibers: Definition, preparation, properties and applications of PVC, Buna-S, Nylon-6,6. Differences between thermoplastics and thermo setting plastics, Fiber reinforced plastics (FRP).

Conducting polymers: Definition and Classification with examples - Mechanism of conduction in transpolyacetylene and applications of conducting polymers.

Biodegradable polymers: Polylactic acid and its applications.

1. Ar

2. Vidyap

3. sush. prasad.

4. V. S. S. S.

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8. V. S. S.

9. Rohit

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UNIT-V- Engineering Materials: [8]

Lubricants: Definition and Characteristics of a good lubricant- thin film mechanism of lubrication, properties of lubricants- viscosity, cloud and pour point, flash and fire point.

Biosensor - Definition, Classification, Amperometric Glucose monitor sensor.

Interpretative spectroscopic applications of UV-Visible spectroscopy for Analysis of pollutants in dye industry, IR spectroscopy in night vision-security, Pollution Under Control- CO sensor (Passive Infrared detection),

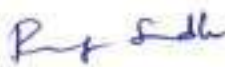
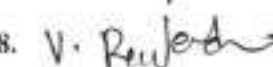
TEXT BOOKS:

1. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010.
2. Engineering Chemistry by Rama Devi, Dr. P. Aparna and Rath, Cengage learning, 2025.

REFERENCE TEXT BOOKS:

1. Engineering Chemistry: by Thirumala Chary Laxminarayana & Shashikala, Pearson Publications (2020)
2. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi 2011.
3. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi 2015.
4. Challenges and Opportunities in Green Hydrogen by Editors: Paramvir Singh, Avinash Kumar Agarwal, Anupma Thakur, R.K Sinha.
5. E-Content- <https://doi.org/10.1142/13094> | October 2023
6. E-books: <https://archive.org/details/EngineeringChemistryByShashiChawla/page/n11/mode/2u>

Signatures of BoS members:

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ANNEXURE-II
ENGINEERING CHEMISTRY LAB

B.Tech. I Year

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Course Objectives:

1. Students will understand and perform experiments based on core chemical principles relevant to engineering applications.
2. Students will learn to estimate the hardness of water to assess its suitability for drinking purposes.
3. Students will acquire the ability to perform acid-base titrations using instrumental methods such as conductometry and potentiometry.
4. Students will gain hands-on experience in synthesizing polymers like Thiokol rubber in the laboratory.

Course Outcomes:

1. Determine water quality parameters and lubricant properties through volumetric and viscometric methods, and analyze their relevance in industrial applications.
2. Apply electrochemical techniques such as conductometry and potentiometry to estimate concentrations of acids and assess chemical reactions.
3. Examine the corrosion behavior of metals under various conditions and evaluate the effect of inhibitors on corrosion rate.
4. Illustrate the synthesis and applications of advanced materials like Thiokol rubber, fuel cells, and smart biomedical materials using real and virtual lab tools.

List of Experiments:

1. Volumetric Analysis: Estimation of Hardness of water by EDTA Complexometry method.
2. Determination of rate of corrosion of mild steel in the presence and absence of inhibitor.
3. Estimation of the concentration of strong acid by Conductometry.

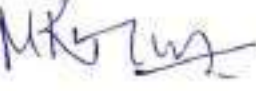
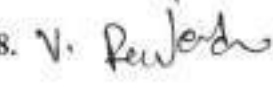
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4. Estimation of the concentration of strong and weak acid in an acid mixture by Conductometry.
5. Estimation of concentration of strong acid with strong base by Potentiometry using quinhydrone
6. Preparation of Thiokol rubber.
7. Estimation of acid value of given lubricant oil.
8. Estimation of viscosity of lubricant oil using Ostwald's Viscometer.
9. Construction of Fuel cell and it's working. (Virtual lab)
10. Smart materials for Biomedical applications (Virtual lab)

REFERENCEBOOKS

1. Lab manual for Engineering chemistry by B. Ramadevi and P. Aparna, S Chand Publications, New Delhi (2022)
2. Vogel's text book of practical organic chemistry 5th edition
3. Inorganic Quantitative analysis by A.I. Vogel, ELBS Publications.
4. College Practical Chemistry by V.K. Ahluwalia, Narosa Publications Ltd. New Delhi (2007).

Signatures of BoS members:

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Open Elective R-25 (To be offered for B.Tech III Year students)

NUTRITIONAL & BIOLOGICAL CHEMISTRY

L	T	P	C
3	0	0	3

Course Outcomes:

- Unit-1** Explain the concepts of nutrition, classify nutrients, and relate their functions to human health
- Unit-2** Classify carbohydrates and fats, describe their properties, and assess their nutritional importance.
- Unit-3** Analyze the role of proteins, vitamins, and minerals in biological systems, and evaluate their functional significance.
- Unit-4** Classify drugs, describe their mechanisms, and illustrate therapeutic uses of selected synthetic and biosynthetic drugs.
- Unit-5** Evaluate the effects of pesticides and steroids on human health, and recommend safety measures to minimize risks.

UNIT-I: Nutrition and Nutrients

Introduction and definition of nutrition, nutrients, adequate, optimum, good nutrition and malnutrition. Classification of nutritional elements (macro and micro nutrients). Food as a source of nutrients and functions of food. Inter relationship between nutrition and health. Water as a nutrient - its function, sources, requirement, water balance and effect of its deficiency.

UNIT-II: Carbohydrates and Fats

Carbohydrates Introduction, properties and classification of Carbohydrates- monosaccharides (Glucose & Fructose), Disaccharides (Maltose, Sucrose) and Polysaccharides (Glycogen & Starch). Nutritional importance of carbohydrates.

Fats: Definition, types of fats, differences between saturated and unsaturated fats and their importance

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UNIT-III: Proteins, Vitamins and Minerals

- Proteins:** Introduction to amino acids and its classification (essential and non essential amino acids). *Proteins*–Structure, properties, biological significance and classification of enzymes.
- Vitamins:** Introductions to vitamins and its classification (water soluble and fat soluble vitamins) and importance.
- Minerals:** Introduction, classification and biological functions of Ca, Fe & Iodine minerals.

UNIT-IV: Drugs

Drugs: Introduction to drugs and drug targets. Classification of drugs. Mechanism of *Synthetic Drugs*: Sulfa drugs (sulfamethoxazole), *Anti Cancer drugs* (Taxol), *Anti tubercular drugs* (isoniazid). *Bio Synthetic drugs*: Antibiotics (Penicillin) *Anti-viral drugs* (Acyclovir). Artificial intelligence in pharma innovation and challenges.

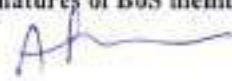
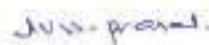
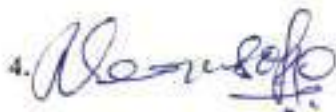
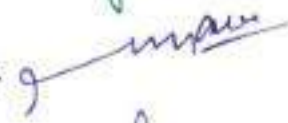
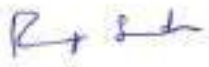
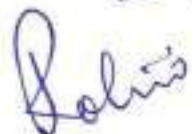
UNIT-V: Effect of Pesticides and Steroids on Human Health

- Pesticides:** Introduction, Organo phosphorus pesticides (Malathion) and Chlorinated pesticides (Lindane) (one example each). Effect of pesticide residues in food & feeds on human health.
- Steroids:** Introduction, uses and effects of steroids on human health.

REFERENCE BOOKS:

- 1 M. Swaminathan, Advanced Textbook on Food & Nutrition
- 2 U. Satyanarayana, Biochemistry, Elsevier Health Sciences, 2013
- 3 G. L. Patrick, Introduction to Medicinal Chemistry, Oxford University Press, New York, 2013
- 4 G. L. David Krupadanam, D. Vijaya Prasad, and K. Varaprasad Rao, Drugs
- 5 A. K. Srivastava and C. Kesavachandran, Health Effects of Pesticides

Signatures of BoS members:

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Proces No: VJIT/Pri.Off/Physics-BoS/56/2025-26

Date: 12-08-2025

OFFICE ORDER

The College Administration is pleased to reconstitute the Board of Studies (BoS) Committee for Physics, with effect from 12th August 2025, with the following members.

S. No.	Name of the Member	Designation
1	Dr. M. Anand Pandarinath, Dept. of Physics, VJIT.	Chairman
2	Dr. K. Venkateshwara Rao, Professor of Nano Technology, JNTUH UCESTH.	JNTUH Nominee
3	Dr. G. Upender, Associate Professor of Physics, UCS, OU, Hyderabad.	External Member
4	Dr. B. Sreenivasa Reddy, Professor of Physics, CBIT, Hyderabad.	External Member
5	Dr. G. Narsinga Rao, Professor of Physics, MLRITM, Hyderabad.	External Member
6	Dr. M. Srinivas Reddy, Professor of Physics, Anurag University, Hyderabad.	External Member
7	Dr MLV Mahesh, Scientist E, DMRL, DRDO, Hyderabad.	External Member
8	Mr. R. Venkata Chalam, Dept. of Physics, VJIT.	Internal Member
9	Dr. P. Sarah, Dept. of Physics, VJIT.	Internal Member
10	Dr. M. Lakshmi, Dept. of Physics, VJIT.	Internal Member
11	Dr. M. Sravan Kumar, Dept. of Physics, VJIT.	Internal Member
12	Dr. R. Mahesh, Dept. of Physics, VJIT.	Internal Member
13	Ms. G. Naga Kumari, Dept. of Physics, VJIT.	Internal Member

- The above members of the Board of studies shall hold the office until further orders with effect from the date of issue of this order.
- The members attending the meeting of the Board of Studies are eligible for T.A. and D.A. as per the rules of the Institutions in force.
- The members are also requested to intimate this office in case of any change in their address and designation.


PRINCIPAL

Copy to:
All the Members



VIDYA JYOTHI
INSTITUTE OF TECHNOLOGY
AN AUTONOMOUS INSTITUTION

[Accredited by NAAC & NBA, Approved by AICTE New Delhi & Permanently Affiliated to JNTUH]
Aziznagar Gate, Chilkur Balaji Road, Hyderabad - 500 075.

Minutes of the Board of studies in Physics meeting held on 18.08.2025.

The following members were present in the meeting.

S.No	Name of the Member	Designation	Signature
1.	Dr. M. Anand Pandarinath, Dept. of Physics, VJIT.	Chairman	
2.	Dr. K. Venkateshwara Rao, Professor of Nanotechnology, JNTUH UCESTH.	JNTUH Nominee	
3.	Dr. G. Upender, Associate Professor of Physics, UCS, OU. Hyderabad.	External Member	
4.	Dr. B. Sreenivasa Reddy, Professor of Physics, CBIT, Hyderabad.	External Member	
5.	Dr. G. Narsinga Rao, Professor of Physics, MLRITM, Hyderabad.	External Member	
6.	Dr. M. Srinivas Reddy, Professor of Physics, Anurag University, Hyderabad.	External Member	
7.	Dr MLV Mahesh, Scientist E, DMRL, DRDO, Hyderabad.	External Member	
8.	Mr. R. Venkata Chalam, Dept. of Physics, VJIT.	Internal Member	
9.	Dr. P. Sarah, Dept. of Physics, VJIT.	Internal Member	
10.	Dr. M. Lakshmi, Dept. of Physics, VJIT.	Internal Member	
11.	Dr. M. Sravan Kumar, Dept. of Physics, VJIT.	Internal Member	
12.	Dr. R. Mahesh, Dept. of Physics, VJIT.	Internal Member	
13.	Ms. G. NagaKumari, Dept. of Physics, VJIT.	Internal Member	

The BOS meeting started with the Chairman, Dr M. Anand, welcoming the members and he informed that the Department of Physics offers 02 theory courses and 01 laboratory course.

1. **Advanced Engineering Physics**
2. **Advanced Engineering Physics Laboratory**
3. **Nanoscience and Nanotechnology**

He presented the contents of the courses and welcomed suggestions from the members.

Resolutions

1. Item No.1: Approval of B. Tech I Year (Theory) Syllabus

The Chairperson of Board of Studies (BoS) presented the syllabus of Advanced Engineering Physics Course for B. Tech I Year.

Resolution (1): The members after a thorough discussion approved the syllabus of Advanced Engineering Physics Course.

Noted and Approved

Item No.2: Approval of B. Tech I Year Laboratory Syllabus

The Chairperson of Board of Studies (BoS) presented the list of experiments of Advanced Engineering Physics Laboratory offered to B. Tech I Year.

Resolution (2): The members after a thorough discussion approved the list of experiments offered to B. Tech I Year.

Noted and Approved

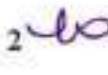
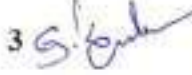
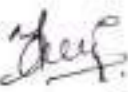
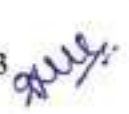
Item No.3: Approval of Nanoscience & Nanotechnology course offered to B. Tech III Year as an open elective course.

The Chairperson of Board of Studies (BoS) presented the details of Nanoscience & Nanotechnology course offered at B. Tech III Year as an open elective subject.

Resolution (3): The members after a thorough discussion approved Nanoscience & Nanotechnology course offered at B. Tech III year as an open elective subject.

Noted and Approved

Signatures of the Members Present:

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(Aziz Nagar, C.B.Post, Hyderabad -500075)

I B. Tech. Syllabus R-25

ADVANCED ENGINEERING PHYSICS

L T P C

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Course Objectives:

1. To study crystal structures and material characterization techniques like XRD.
2. To understand fundamental concepts of quantum mechanics and their applications in solids.
3. To introduce quantum computing principles, quantum gates, and basic quantum measurements.
4. To learn the various wave optics techniques, phenomena and applications.
5. To explore the working and applications of lasers and fibre optics in modern technology.

Course Outcomes:

1. **CO1:** Analyze crystal structures and apply XRD technique for material characterization.
2. **CO2:** Apply quantum mechanical principles to explain particle behaviour and discrete energy levels in materials.
3. **CO3:** Understand quantum computing concepts, use quantum gates, and explain basic quantum measurements.
4. **CO4:** Classify various wave optics techniques and explain their phenomena and applications.
5. **CO5:** Explain the principles of lasers and fibre optics and their applications in various communications.

UNIT-I: Crystallography & Materials Characterization [09Hrs]

Introduction: Unit cell, Space lattice, Basis, Lattice parameters; Crystal structures, Bravais lattices, Atomic radius, Number of atoms per unit cell, Coordination number, Distance of nearest neighbourhood, Packing factor of Simple cubic (SC), Body Centered Cubic (BCC), Face Centered Cubic (FCC) structure; Miller indices, Inter-planar distance. Concept of Nanomaterials: Surface area to Volume ratio, X-ray diffraction: Bragg's law, Powder method, Calculation of average crystallite size using Debye Scherrer formula.

UNIT-II: Wave Optics [09 Hrs]

Principle of superposition, Coherence, Interference - Interference in thin films by reflection, Newton's rings, Diffraction - Fresnel and Fraunhofer diffraction,

Signatures of the Members Present:

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Fraunhofer diffraction due to single slit, Plane diffraction grating, Resolving power of grating (qualitative treatment), Polarization – Polarization of light waves, Plane of vibration, Plane of polarization, Double refraction, Nicol's Prism, Applications of polarization.

UNIT-III: Quantum Mechanics [09Hrs]

Introduction: de-Broglie hypothesis, Heisenberg uncertainty principle, Postulates of quantum mechanics; Operators in quantum mechanics, Eigen values and Eigen functions, Expectation value, Physical significance of wave function, Schrödinger's time independent wave equation, Application of Schrödinger's time independent wave equation for a particle in 1-D box; Expression for solution of wave function and derivation for Eigen energy states, Band Theory of solids, Classification of solids based on Band theory.

UNIT-IV: Quantum Computing [09Hrs]

Introduction to Quantum Computing, Mathematical Tools: Linear Algebra Basics, Tensor Product, Dirac Notation (Bra-Ket) and Properties, Hilbert Space, Bloch Sphere, Superposition, Classical Bits vs Quantum Bits (Qubits), Multiple Qubit Systems and Entanglement, Quantum Evolution and Measurements. Quantum Gates: Hadamard Gate, CNOT, Pauli-X gate, Swap Gate and Quantum Circuits. Future of Quantum Computing.

UNIT-V: Laser and FiberOptics [09Hrs]

Introduction to interaction of radiation with matter: Absorption, Spontaneous emission and Stimulated emission, Einstein coefficients and their relations, Characteristics of a laser, Population inversion, Components of a laser: active medium, pumping source, optical resonator, Construction and working of Ruby laser, He-Ne laser, Applications of lasers.

Introduction to Optical Fibers: Total internal reflection, Construction of optical fiber, Acceptance angle and Numerical aperture, Classification of optical fibers (step and graded index fibers), Block diagram of optical fiber communication system, Applications of optical fibers.

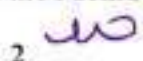
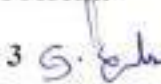
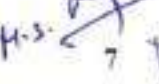
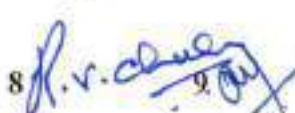
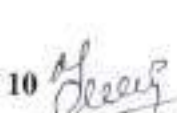
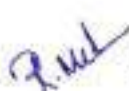
Textbooks:

1. Engineering Physics, V.Rajendran; McGraw Hill Education.
2. Engineering Physics by B K Pandey and S Chaturvedi; CENGAGE Learning.
3. Introduction to Classical and Quantum Computing, by Thomas G. Wong; Rooted Grove.

Reference books:

1. Quantum computing: A Gentle Introduction by Rieffel and Polak; The MIT Press.
2. Introduction to Solid State Physics, Charles Kittel, John Wiley & Sons, Inc.
3. Optics, AjoyK. Ghatak, McGraw Hill Education India.

Signatures of the Members Present:

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I B. Tech. Syllabus R-25

ADVANCED ENGINEERING PHYSICS LABORATORY

L T P C

0 0 2 1

Course Objectives:

1. To enable students to determine fundamental physical constants and material parameters using modern physics experiments.
2. To provide practical exposure to optical phenomena such as interference, diffraction, and dispersion using precision instruments.
3. To develop skills in the characterization of semiconductor devices including LEDs, photodiodes, and solar cells.
4. To impart knowledge and hands-on experience with laser-based measurements.
5. To familiarize students with optical fiber parameters and loss measurements, and strengthen skills in data analysis, interpretation, and reporting.

Course Outcomes:

By the end of the course, the student will be able to:

1. **CO1:** Determine fundamental constants such as Planck's constant and the energy gap of a semiconductor.
2. **CO2:** Analyze the optical phenomena including interference, diffraction, and dispersion through experimental study.
3. **CO3:** Evaluate the electrical and optical characteristics of semiconductor devices such as LEDs, photodiodes, and solar cells.
4. **CO4:** Demonstrate working knowledge of lasers through wavelength determination using single-slit and diffraction grating methods.
5. **CO5:** Determine the numerical aperture and bending losses of optical fibers, and apply scientific methods for accurate data collection and reporting.

List of Experiments:

1. Determination of work function and Planck's constant using the photoelectric effect.
2. Determination of the energy gap of a semiconductor.
3. Determination of the radius of curvature of a plano-convex lens by forming Newton's rings.

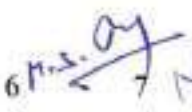
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4. Determination of the wavelength of a given monochromatic light source using a plane diffraction grating.
5. Determination of the dispersive power of a given prism.
6. Determination of the operating point for maximum efficiency of a given LED.
7. Determination of the operating point of a photodiode under varying illumination levels
8. Determination of the optimum load for maximum power output of a given solar cell.
9. (a) Determination of the wavelength of a laser using a single slit.
(b) Determination of the wavelength of a laser using a diffraction grating (N-slits).
10. (a) Determination of the numerical aperture of a given optical fiber.
(b) Determination of the bending losses in a given optical fiber.

Note: Any 8 experiments are to be performed.

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Open Elective R-25 (To be offered for B.Tech III Year) Nanoscience and Nanotechnology

L T P C
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Course Outcomes

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

1. Understand the fundamental concepts of Nanoscience and Nanotechnology
2. Prepare nanomaterials by using various synthesis techniques
3. Understand the different characterization techniques of the nanomaterials
4. Analyze the properties of the nanomaterials
5. Undertake the mini projects on variety of Nanomaterials and Nano fluids based on various engineering applications.

UNIT 1: Basics of Nanoscience

Basic definitions-Nanometer, Nanoscale, Nanomaterials, Nanoscience, and Nanotechnology, origin of Nanotechnology, History of nanomaterials, Surface to volume ratio, quantum confinement effect, Classification of Nano structured materials -0D, 1D, 2D, 3D with examples.

UNIT 2: Synthesis of Nanomaterials

Synthesis of nanomaterials: Synthesis routes- Top-Down and Bottom-Up approaches. Solid- state reaction method, Hydrothermal and Solvo-thermal techniques. Sol-gel, Chemical vapour deposition method (CVD), Physical vapour deposition (PVD) method.

UNIT3: Characterization techniques (Qualitative discussion only)

Characterization of Nano-materials by X-ray diffraction (XRD), Fourier transform infrared Spectrometer (FTIR), Field emission scanning electron microscopy (FESEM), Transmission electron microscopy (TEM), Scanning tunneling microscopy (STM), Atomic force microscopy (AFM).

Signatures of the Members Present:

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UNIT 4: Properties of Nanomaterials

Physical properties: Large surface area, influence of nanosize on melting point, reduced imperfections in nanomaterials.

Chemical properties: Influence of nanosize on chemical properties, Enhanced reactivity and solid solubility.

Electrical and Electronic properties: electrical resistivity, energy band gap and effect of nano size on Moore's law, future of electronics.

Optical properties: Role of plasmons in the determination of color, Nanoplasmonics- Lycurgus cup

Magnetic properties: Magnetism in nanomaterials, ferromagnetic domains, mono-domain materials, super paramagnetism in nanomaterials, Coercivity, size dependent coercivity

Mechanical Properties: Hardness of nanomaterials, Hall-Petch relation, Strength of nanomaterials, Hook's law, Super plasticity, nanofluids

UNIT5: Applications of Nanomaterials

Applications of Nanomaterials in Electronic, Textile, Automobile and Cosmetic industries, Medical applications, Concerns and challenges of Nanotechnology.

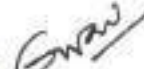
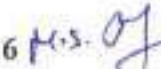
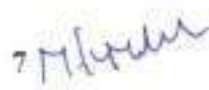
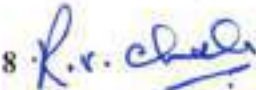
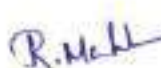
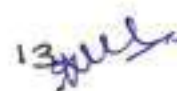
Textbooks:

1. Textbook of Nano Science and Nano -Technology, B.S. Murthy, P. Shankar, Baldev Raj, B.B. Rath and James Munday, University Press-IIM, 2013
2. Nanomaterials, Nanotechnologies and Design: An Introduction for Engineers and Architects, Daniel L. Schodek, Paulo Ferreira, Michael F. Ashby, Butterworth-Heinemann, 2009.

Reference Books:

1. Nanotechnology- Technology revolution of 21st century, Er. Rakesh Rathi, S.Chand & Company ltd, 2009.
2. Chemistry of Nanomaterials: Synthesis, properties and applications by C. N. R. Rao, A. Müller, A. K. Cheetham (Eds.) Wiley -VCH, 2006.

Signatures of the Members Present:

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ENGLISH FOR SKILL ENHANCEMENT

B.Tech. I Year I & II Sem – R25

(Common for all branches)

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LEARNING OBJECTIVES:

This course will enable the students to:

1. Improve their vocabulary.
2. Use appropriate sentence structures in their oral and written communication.
3. Develop their reading and study skills.
4. Equip students to write paragraphs, essays, précis and draft letters.
5. Acquire skills for Technical report writing.

COURSE OUTCOMES:

Students will be able to:

1. Choose appropriate vocabulary in their oral and written communication. (SDG 4.8)
2. Demonstrate their understanding of the rules of functional grammar and sentence structures. (SDG 4)
3. Develop comprehension skills from known and unknown passages. (SDG 4.8)
4. Write paragraphs, essays, précis and draft letters. (SDG 4)
5. Write abstracts and reports in various contexts. (SDG 4.8)

UNIT –I

Theme : Perspectives

Lesson on 'The Generation Gap' by Benjamin M. Spock from the prescribed textbook titled *English for the Young in the Digital World* published by Orient Black Swan Pvt. Ltd.

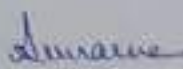
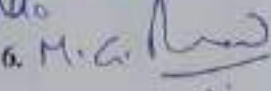
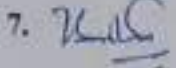
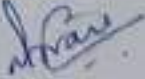
Vocabulary : The Concept of Word Formation-The Use of Prefixes and Suffixes-Words Often Misspelt - Synonyms and Antonyms

Grammar : Identifying Common Errors in Writing with Reference to Parts of Speech particularly Articles and Prepositions—Degrees of Comparison

Reading : Reading and Its Importance-Sub Skills of Reading-Skimming and Scanning.

Writing : Sentence Structures and Types -Use of Phrases and Clauses in Sentences- Importance of Proper Punctuation-Techniques for Writing Precisely-Nature and Style of Formal Writing.

Signatures of BoS Members

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UNIT-II

Theme : Digital Transformation

Lesson on 'Emerging Technologies' from the prescribed textbook titled *English for the Young in the Digital World* published by Orient Black Swan Pvt. Ltd.

Vocabulary : Homophones, Homonyms and Homographs

Grammar : Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement.

Reading : Reading Strategies-Guessing Meaning from Context Identifying Main Ideas - Exercises for Practice

Writing : Paragraph Writing—Types, Structures and Features of a Paragraph - Creating Coherence—Linkers and Connectives - Organizing Principles in a Paragraph— Defining- Describing People, Objects, Places and Events—Classifying- Providing Examples or Evidence - Essay Writing - Writing Introduction and Conclusion.

UNIT-III

Theme : Attitude and Gratitude

Poems on 'Leisure' by William Henry Davies and 'Be Thankful'

Unknown Author from the prescribed textbook titled *English for the Young in the Digital World* published by Orient Black Swan Pvt. Ltd.

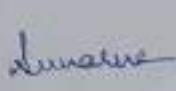
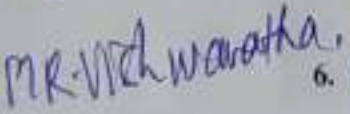
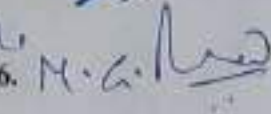
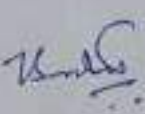
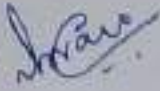
Vocabulary : Words Often Confused-Words from Foreign Languages and their Use in English.

Grammar : Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses.

Reading : Sub-Skills of Reading - Identifying Topic Sentence and Providing Supporting Ideas - Exercises for Practice.

Writing : Format of a Formal Letter-Writing Formal Letters E.g. Letter of Complaint, Letter of Requisition, Job Application with CV/ Resume- Difference between Writing a Letter and an Email - Email Etiquette.

Signatures of BoS Members

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UNIT-IV

Theme : Entrepreneurship

Lesson on 'Why a Start-Up Needs to Find its Customers First' by Pranav Jain from the prescribed text book titled *English for the Young in the Digital World* published by Orient Black Swan Pvt. Ltd.

Vocabulary : Standard Abbreviations in English—Inferring Meanings of Words through Context— Phrasal Verbs—Idioms.

Grammar : Redundancies and Clichés in Written Communication – Converting Passive to Active Voice and Vice-Versa.

Reading : Prompt Engineering Techniques—Comprehending and Generating Appropriate Prompts - Exercises for Practice

Writing : Writing Practices-Note Making-Precis Writing.

UNIT-V

Theme : Integrity and Professionalism

Lesson on 'Professional Ethics' from the prescribed textbook titled *English for the Young in the Digital World* published by Orient Black Swan Pvt. Ltd.

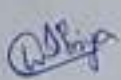
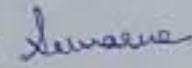
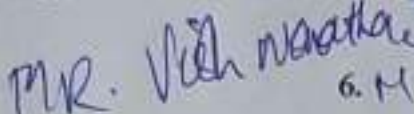
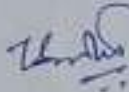
Vocabulary: Technical Vocabulary and their Usage—One Word Substitutes—Collocations.

Grammar : Direct and Indirect Speech—Common Errors in English (Covering all the other aspects of grammar which were not covered in the previous units)

Reading : Survey, Question, Read, Recite and Review (SQ3R Method) – Inferring the Meaning and Evaluating a Text—Exercises for Practice

Writing : Report writing—Technical Reports—Introduction—Characteristics of Report – Categories of Reports Formats- Structure of Reports (Manuscript Format)- Types of Reports- Writing a Technical Report.

Signatures of BoS Members

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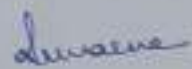
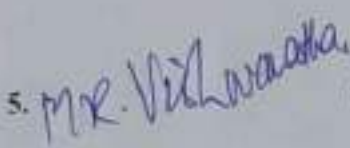
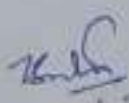
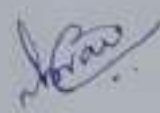
TEXTBOOK:

1. Board of Editors. 2025. *English for the Young in the Digital World*. Orient Black Swan Pvt. Ltd.

REFERENCE BOOKS:

1. Swan, Michael. (2016). *Practical English Usage*. Oxford University Press. New Edition.
2. Karal, Rajeevan. 2023. *English Grammar Just for You*. Oxford University Press. New Delhi.
3. 2024. *Empowering with Language: Communicative English for Undergraduates*. Cengage Learning India Pvt. Ltd. New Delhi.
4. Sanjay Kumar & Pushp Lata. 2022. *Communication Skills – A Workbook*. Oxford University Press. New Delhi.
5. Wood, F.T. (2007). *Remedial English Grammar*. Macmillan.
6. Vishwamohan, Aysba. (2013). *English for Technical Communication for Engineering Students*. McGraw-Hill Education India Pvt.

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ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

B. Tech. I Year I and II Sem-R25

(Common for all branches)

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Listening Skills:

Objectives

1. To enable students develop their active listening skills
2. To equip students with necessary training in listening, so that they can comprehend the speech of people from different linguistic backgrounds

Speaking Skills:

3. To improve their pronunciation and neutralize accent
4. To enable students express themselves fluently and appropriately
5. To practice speaking in social and professional contexts

Learning Outcomes: Students will be able to:

1. Listen actively and identify important information in spoken texts (SDG 4)
2. Interpret the speech and infer the intention of the speaker (SDG 4)
3. Improve their accent for intelligibility (SDG 4, 8, 10)
4. Speak fluently with clarity and confidence (SDG 4, 8, 10)
5. Use the language in real life situations (SDG 4, 8)

Exercise-I

CALL Lab:

Instruction: Speech Sounds- Listening Skill-Importance - Purpose- Types-Barriers- Active Listening

Practice: Listening to Distinguish Speech Sounds (Minimal Pairs)-Testing Exercises

ICS Lab:

❖ **Diagnostic Test-Activity titled 'Express Your View'**

Instruction: Spoken and Written language - Formal and Informal English - Greetings

- Introducing Oneself and Others

Practice: Any Ice-Breaking Activity

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Exercise-II

CALL Lab:

Instruction: Listening vs. Hearing-Barriers to Listening

Practice: Listening for General Information - Multiple Choice Questions - Listening

ICS Lab:

Instruction: Features of Good Conversation-Strategies for Effective Communication

Practice: Role Play Activity-Situational Dialogues -Expressions used in Various Situations -Making Requests and Seeking Permissions-Taking Leave- Telephone Etiquette

Exercise-III

CALL Lab:

Instruction: Errors in Pronunciation- Tips for Neutralizing Mother Tongue Influence(MTI)

Practice: Differences between British and American Pronunciation -Listening Comprehension Exercises

ICS Lab:

Instruction: Describing Objects, Situations, Places, People and Events

Practice: Picture Description Activity- Looking at a Picture and Describing Objects, Situations, Places, People and Events

Exercise-IV CALL Lab:

Instruction: Techniques for Effective Listening

Practice: Listening for Specific Details-Listening-Gap Fill Exercises-Listening Comprehension Exercises

ICS Lab:

Instruction: How to Tell a Good Story -Story Star-Sequencing-Creativity

Practice: Activity on Telling and Retelling Stories-Collage

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Exercise-V

CALL Lab:

Instruction: Identifying the literal and implied meaning

Practice: Listening for Evaluation – Write the Summary–Listening Comprehension Exercises

ICS Lab:

Instruction: Understanding Non-Verbal Communication

Practice: Silent Speech-Dumb Charades Activity

❖ **Post-Assessment Test on 'Express Your View'**

Suggested Software:

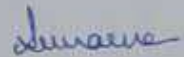
- Cambridge Advanced Learners 'English Dictionary with CD.
- Grammar Made Easy by Darling Kindersley.
- Punctuation Made Easy by Darling Kindersley.
- Oxford Advanced Learner's Compass, 10th Edition.
- English in Mind (Series1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- English Vocabulary in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS).

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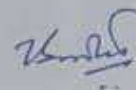
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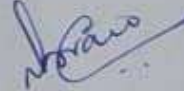
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REFERENCE BOOKS:

1. Shobha, KN & Rayen, J. Lourdes. (2019). *Communicative English – A workbook*. Cambridge University Press
2. Board of Editors. (2016). *ELCS Lab Manual: A Workbook for CALL and ICS Lab Activities*.
Orient Black Swan Pvt. Ltd.
3. Mishra, Veerendra et al. (2020). *English Language Skills: A Practical Approach*. Cambridge University Press
4. (2022). *English Language Communication Skills- Lab Manual cum Workbook*.
Cengage Learning India Pvt. Ltd.
5. Ur, Penny and Wright, Andrew. 2022. *Five Minute Activities – A Resource Book for Language Teachers*. Cambridge University Press.

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