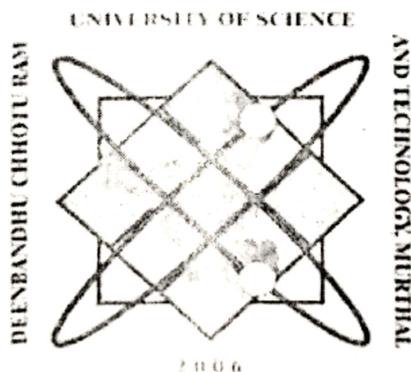


CURRICULUM
for
Universal Human Values-II (UHV-II)
(Scheme & Syllabi for First and Second semesters)

for
UNDERGRADUATE DEGREE
COURSE

IN
Bachelor of Technology
(B.Tech.)
(Common for All Branches)

[w.e.f. 2024-25]



DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE AND TECHNOLOGY
(Established Under Haryana Legislature Act No. 29 of 2006)
Murthal-131039, Sonapat (Haryana)
www.dcrust.ac.in

SYLLABUS

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY
MURTHAL (SONEPAT) HARYANA-131039

DEPARTMENT OF MATHEMATICS

B.Tech. (Computer Science & Engg)

Semester- I

(Effective from Session 2024-25)

B.T

Course Code : To be allotted	Internal Marks : 25
Category: Basic Science Course	
Title of the Course: Mathematics I	External Marks: 75
L-T-P: 3-1-0	Maximum Marks: 100
Credits: 4	Duration of Exam: 3 Hours

About the Course:

Mathematics plays a pivotal role in Engineering for making the foundation of students so that they can apply their knowledge to solve real world problems. The concept of matrices, algebra and calculus in the above paper will equip engineering students to make calculations and measurement effectively. Further the concepts of linear algebra are used in search engines, testing software codes in software engineering and machine learning etc.

Course Objective (CO):

1. To familiarize the students with techniques in basic calculus and linear algebra.
2. To equip the students with standard concepts and tools at an intermediate to advanced level .
3. To know the advanced level of mathematics and applications that they would find useful in their disciplines.

Unit-I (12 Lectures)

Matrices addition and scalar multiplication, matrix multiplication; Linear systems of equations, linear Independence, rank of a matrix, determinants, Cramer's Rule, inverse of a matrix, Gauss elimination and Gauss-Jordan elimination.

Unit-II (12 Lectures)

Eigen values, Eigen vectors, Cayley Hamiltan Theorem symmetric, skew-symmetric, and orthogonal Matrices, Eigen space. Diagonalization; Inner product spaces, Gram-Schmidt orthogonalization.

Unit-III (12 Lectures)

Taylor's and Maclaurin theorems with remainders; Maxima and minma of function of single independent variable.

Curvature & Asymptotes (Cartesian and polar form), Evolutes and involutes; Evaluation of definite and improper integrals; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions.

Unit-IV (12 Lectures)

Vector space, linear dependence and independence of vectors, basis, dimension; Linear transformations (maps), range and kernel of a linear map, rank and nullity, Inverse of a linear transformation, rank-nullity theorem, composition of linear Maps, Matrix associated with a linear map.

Text Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint 2008.

3. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

Reference Books:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
3. Veerarajan T., Engineering Mathematics for firstyear, Tata McGraw-Hill, New Delhi, 2008.
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
5. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East-West press, Reprint 2005.

Course outcomes:

1. The students will be able to solve linear systems of equations using matrices.
2. The students will learn to apply differential and integral calculus to notions of curvature and to improper integrals.
3. They will have a basic understanding of Beta and Gamma functions.
4. They will understand essential tools of linear algebra including linear transformations, eigen values, diagonalization and orthogonalization to solve engineering problems.

Note:

1. The paper setter will set two questions (with/without parts) from each unit & a ninth compulsory question comprising of 5 sub-parts, covering the entire syllabus. The examinee will attempt 5 questions in all, along with the compulsory question (with all its sub-parts), selecting one question from each unit.
2. The use of programmable devices such as programmable calculators, etc. is not allowed during the exam.

CO-PO/PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1																
CO2																
CO3																
CO4																
Average																

Lesson Plan for Theory Lecture

(Below format be used by the concerned teacher for framing and implementing the lecture plan)

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY
MURTHAL (SONEPAT) HARYANA-131039
DEPARTMENT OF -----
B.Tech. -----
Semester- I
(Effective from Session 2024-25)

Course Code	Title of the Course	Course Structure
		L-T-P
Course Outcome:		
1.		
2.		
3.		
4.		
Unit Number	Topic to be covered	Lecture No.
I		
II		
III		
VI		
Evaluation Scheme for Continuous Assessment		
Details of Course Co-ordinator		
Course Co-ordinator	Mobile No.	E-mail ID

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY
MURTHAL (SONEPAT) HARYANA-131039
DEPARTMENT OF PHYSICS
B. Tech 1st Semester Course
(Effective from Session 2024-25)



Course Code :	Internal Marks : Theory: 25; Lab: 15
Title of the Course: Quantum Mechanics for Engineers	External Marks: Theory: 50; Lab: 10
L-T-P: 3-0-2/3-1-2	Maximum Marks: 100
Credits: 4	Duration of Exam: 03 Hours

Brief Write-Up About the Course

Quantum mechanics is a fundamental theory that describes the behaviour of nature at the scale of atoms and even smaller. This theory was developed with unique fundamental ideas totally different from the classical physics. It answered various fundamental questions, which cannot be explained on the basis of classical physics. In modern world, quantum mechanics is an essential part of science and technology, which led to the development of major technological fields like lasers, light-emitting diodes, electronic devices, medical imaging, electron microscopes, and many more.

Therefore, keeping in view the importance of Quantum Mechanics, the syllabus have been designed in such a way that young engineers will come to know the preliminary fundamental ideas behind the development of quantum mechanics, mathematical and theoretical concept of dual nature of electromagnetic waves and moving particle, origin of Schrodinger wave equation and its application to micro scale problems and also the quantum theory of formation of energy bands in solids.

Course Objective (CO):

1. Let to know the shortcomings of classical physics and fundamental ideas of Quantum Mechanics
2. Let to know the dual nature of matter and basic terminologies of Quantum Mechanics
3. Let to know the significance of Schrodinger wave equation and its applications in Quantum world
4. Let to know theoretically the formation of energy bands in solids

UNIT-I (Lecture- 10)

Discrepancies of classical physics, Origin of quantum mechanics, black body radiation, Planck's hypothesis, experimental justification of Planck's idea, Planck's justification of black body radiation, deduction of Wien's and Rayleigh-Jeans distribution laws from Planck's idea. Particle nature of electromagnetic waves: Photoelectric effect and its justification using Planck's idea, Franck Hertz experiment. Compton effect, pair-production.

UNIT-II (Lecture- 12)

De Broglie hypothesis and its experimental justification using two slit experiment with electron. Davisson-Germer experiment, Concept of wave packet, group and phase velocity and relationship between them, Bohr's explanation of stability and emission of line spectra, Heisenberg uncertainty principal, non existence of electron in atomic nucleus and radius of Bohr's first orbit.

UNIT-III (Lecture- 11)

Born interpretation of wave function and its significance, Time-independent Schrodinger equation, Time-dependent Schrodinger equation, Normalization of wave function, properties of well behaved wave functions probability current density, Expectation values and its numerical problems. Solution of time-independent Schrodinger equation for one dimensional particle in a box, Square-well potential with finite barriers.

UNIT-VI (Lecture- 12)

Classical and quantum Free electron theory of metals, Fermi level, Fermi distribution function, density of states, wave function in periodic potential and Bloch's theorem for particles in a periodic potential, Kronig-Penney model and origin of energy bands, E-K diagram, Brillouin Zones, effective mass and velocity of electron. Distinction between metals, semiconductors and insulators

**Text Books:**

1. S.P Taneja, Modern Physics for Engineers (R Chand & Company, New Delhi)
2. Sanjeev Garg and T P Singh, Engineering Physics(revised edition)(Professional Publication)
3. Satya Prakash, Advanced Quantum Mechanics(Kedar Nath Ram Nath Publication Meerut)
4. Nikhil Ranjan Roy, Introduction to Quantum Mechanics (Vikas Publishing House Pvt. Ltd.)

Reference books:

1. Eisberg and Resnick, Introduction to Quantum Physics
2. D.J. Griffiths, Introduction to Quantum mechanics
3. Richard Robinett, Quantum Mechanics
4. Daniel Mc Quarrie, Quantum Chemistry
5. Arthur Beiser, Prospective of Modern Physics
6. Charles Kittel, Introduction to Solid state Physics

Course Outcome (CO): After completion of this course students would be able to understand

1. The shortcomings of classical physics and origin of quantum mechanics
2. The dual nature of electromagnetic waves and quantum particles and basic terminology in quantum mechanics
3. The Schrodinger wave equations and its applications in Quantum world
4. Formation of Energy Band in solids

Note:

1. The paper setter will set two questions (with/without parts) from each units, the first question will be compulsory and comprising of 5 to 10 sub-parts, covering the entire syllabus. The examinee will attempt 5 questions in all, along with the compulsory question, selecting one question from each unit. All questions will carry equal marks.
2. The use of programmable devices such as programmable calculators, etc. is not allowed during the exam.

Laboratory/Virtual Laboratory/Fieldwork-

Note : Students have to perform at least six experiments in total from group A, B and C, by selecting at least 3 from group B. More experiments may be added time to time as per requirement.

Group A (Basic experiments)

1. To measure the least count of Vernier caliper and to determine the thickness of any object using Vernier caliper.
2. To measure the least count of Screw Gauge and also measure the diameter of the wire using Screw Gauge.
3. To measure the least count of the Spherometer and to calculate the radius of curvature of a convex surface using Spherometer.
4. To test and do measurements on various electronic devices using Multimeter.

Group B

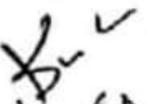
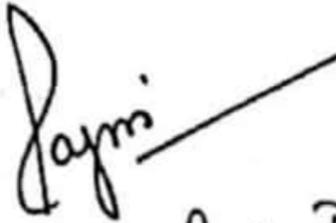
1. To find the value of Planck's constant using photocell/LED.
2. To find the Ionization potential of Mercury.
3. To study Hall effect.
4. To find band gap of semiconductor using Four Probe method
5. To determine frequency of A.C. mains using Sonometer.
6. To find the capacitance of condenser using flashing and quenching apparatus.
7. To find the wavelength of monochromatic light using Newtons ring experiment.
8. To Study the diffraction pattern using He-Ne laser.

Group C (virtual experiments)

1. Photoelectric effect experiment.
Link [http://mpv-au.vlabs.ac.in/modern-physics/Photo Electric Effect/](http://mpv-au.vlabs.ac.in/modern-physics/Photo%20Electric%20Effect/)
2. LC circuit and LCR circuit experiment
(Link <http://vlab.amrita.edu/?sub=1&brch=75&sim=326&cnt=1>)
3. Resonance phenomena in LCR circuits experiment
(Link <http://vlab.amrita.edu/?sub=1&brch=75&sim=325&cnt=1>)
4. To find the wavelength of monochromatic light using Newton's Ring experiment.
(Link: <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=335&cnt=1>)
5. To study moment of Inertia of a flywheel.
(Link :<https://vlab.amrita.edu/index.php?sub=1&brch=74&sim=571&cnt=1>)
6. To find the torque and angular acceleration of a flywheel.
(Link: <https://vlab.amrita.edu/index.php?sub=1&brch=74&sim=1517&cnt=1>)
7. Diffraction Grating experiment
(Link [http://ov-au.vlabs.ac.in/optics/Diffraction Grating/](http://ov-au.vlabs.ac.in/optics/Diffraction%20Grating/))
8. Minimum deviation from a prism.
(Link [http://ov-au.vlabs.ac.in/optics/Spectrometer i d Curve/](http://ov-au.vlabs.ac.in/optics/Spectrometer%20i%20d%20Curve/))
9. Determination of Cauchy's constants through spectrometer
(Link [http://ov-au.vlabs.ac.in/optics/Cauchys Constant/](http://ov-au.vlabs.ac.in/optics/Cauchys%20Constant/))
10. Resolving power of a prism
(Link [http://ov-au.vlabs.ac.in/optics/Resolving the Power/](http://ov-au.vlabs.ac.in/optics/Resolving%20the%20Power/))

Self-Study based on Indian Knowledge System

CO-PO/PSO mapping																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1																
CO2																
CO3																
CO4																
Average																

 (Dr. Pardeep Singh)
  (Dr. Ravinder)
  (Dr. Suinder Duhra)
  (Prof. Rajni Shukla)

SYLLABUS
DEENBANDHUCHHOTURAMUNIVERSITYOFSCIENCE&TECHNOLOGY
MURTHAL (SONEPAT) HARYANA-131039
DEPARTMENTOFCOMPUTER SCIENCE AND ENGINEERING
First Year(I/II SemesterCourse)
(EffectivefromSession2024-25)

CourseCode: CSE-101D	Internal Marks: 25 (T)+15 (L)
Title oftheCourse:PROGRAMMING FOR PROBLEM SOLVING	External Marks: 50 (T)+10(L)
L-T-P: 3-0-2	Maximum Marks: 60(T)+40(L)
Credits: 4	Durationof Exam: 3 Hours

Brief Write-UpAbout theCourse(100-150 words)
 Programming for Problem Solving course introduces students to foundational concepts in computer systems and programming using the C language. It focuses on problem-solving through the application of programming techniques, algorithms, and structured coding practices. Students will learn to represent algorithms using flowcharts and pseudocode before progressing to C programming with topics like data types, variables, conditional branching, loops, arrays and common errors. It also introduces functions, parameter passing, recursion, structures, and pointers. Advanced topics include dynamic memory allocation, file handling, and preprocessor directives.

- CourseObjective(CO):**
1. To understand the components of a computer system.
 2. To understand means of problem representation.
 3. To develop programming skills using different types of data, decision structures, loops, recursion, functions, pointers, data files and dynamic memory allocation etc.
 4. To learn the process of compiling and debugging programs in C.

UNIT-I (Lecture- 9)

Computer system components, Block diagram of a computer, Computer memory and its classification, Types of Software - System software and Application software, Introduction to Operating system, Compiler, Interpreter; Algorithm and its representation: Flowchart and Pseudocode with examples.
 Basic programming in C using data types, variables, constants, operators and conditional branching.

UNIT-II (Lecture-10)

Operators and Expressions, precedence of Arithmetic operators, Conditional Branching and Loops, Iteration and loops. Arrays: Arrays (1-D, 2- D), Character arrays and Strings.
User defined functions, Return values and their types, Parameter passing in functions, Call by value, Passing arrays to functions, scope, visibility and lifetime of variables.

UNIT-III(Lecture-11)

Recursion, Example programs - Finding Factorial, Fibonacci series, Ackerman function etc.
 Structure: Defining structures, Array of Structures, Arrays within structures, Structures within structures, Unions, Structure vs. Union.
 Pointers: Defining pointers and its operations, Array of pointers, Use of Pointers in self-referential structures, idea of call by reference.

UNIT-IV(Lecture-10)

Enumerations, Preprocessor directives, macro definition, conditional compilation, storage classes. Dynamic memory allocation, File Handling: Opening and closing of files, File Input/output functions, Text file and Binary files.

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1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill.
3. Behrouz A. Forouzan, Richard F. Gilberg, Thomson, Computer Science- A Structured Programming Approach Using C, Cengage Learning.
4. Yashwant P. Kanetkar, Let Us C, BPB Publications.

Referencebooks:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition, Pearson Education.

CourseOutcome(CO):

The student will learn:

1. To develop basic understanding of computers, the concept of algorithm and analyze a problem in the form of graphical notation.
2. Basic concepts of programming to solve problem using C.
3. To design creative solutions to real life problems faced by the industry.
4. A broad perspective about the uses of computers in engineering industry.

Note:

1. The paper setter will set two questions (with/ without parts) from each units, the first question will be compulsory and comprising of 5 to 10 sub-parts, covering the entire syllabus. The examinee will attempt 5 questions in all, along with the compulsory question, selecting one question from each unit. All question will carry equal marks.

Laboratory/VirtualLaboratory/Fieldwork-(PROGRAMMING FOR PROBLEM SOLVING) Choice of Experiments from the following (Execute minimum 20 programs from the list using C programming language):

1. Write a program to add, subtract, multiply and divide two numbers.
2. Write a program to find area and perimeter of a circle and a triangle.
3. Write a program to find the largest of three numbers. (if-then-else).
4. Write a program to find roots of quadratic equation using switch statements.
5. Write a program to find the largest number out of ten numbers (for-statement).
6. Write a program using arrays to find the largest and second largest no. out of given 50 nos.
7. Write a program to multiply two matrices.
8. Write a program to find the factorial of a given number using recursion.
9. Write a program to find the Fibonacci series using recursion.
10. Write a program to convert a given decimal number into binary number.
11. Write a program to find sum of digits of a number.
12. Write a program to reverse a given number.
13. Write a program to generate Pascal's triangle.
14. Write a program to generate pyramid of numbers.
15. Write a program to check that the input string is a palindrome or not.
16. Write a program to concatenate two strings.
17. Create a structure called "Student" with members - name, age, and total marks. Write a program to input data for two students, display their information, and find the average of total marks.
18. Define a structure named "Date" with members - day, month, and year. Write a program to input two dates and find the difference in days between them.
19. Write a program to illustrate the use of enumerators.

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20. Write a program to demonstrate the use of Unions.
21. Write a program which creates a file and writes into it supplied input.
22. Write a program to create and store multiple lines in a text file.
23. Write a program to read an existing file and store the lines in an array.
24. Write a program to count the number of lines, words and characters in a file.
25. Write a program to edit a file by deleting a line and appending multiple lines to the end of a text file.

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English for Technical Writing (Theory)
BTech Ist year(Common for all branches) & BBA
w.e.f session 2024-25

Course Code	:	HSMC-01
Course Title	:	English for Technical Writing
Number of Credits	:	4 (L: 3, T: 0, P: 2)
Course Category	:	Humanities & Social Science Courses

Course Objectives:

1. To provide learning environment to practise listening, speaking, reading and writing skills
2. To assist students carry on the tasks and activities through guided instructions and materials
3. To effectively integrate English language learning with employability skills and training
4. To apply techniques of writing skills in technical writing, through real life examples

Course Outcomes:

1. Enabling students become effective and successful communicators in social, academic and professional lives
2. Equipping them with basic skills to excel in Technical Writing
3. Enabling them speak correct and acceptable English so that they have communicative intelligibility within and outside their country
4. Write effective reader-friendly technical documents in good English

Course Content:

Unit I: Vocabulary Building

Synonyms, antonyms and standard abbreviations
One Word Substitution (List attached)
Commonly used idioms in English and Phrasal Verbs (List attached)
Foreign words/expressions commonly used in English (List Attached)

Unit- II: Basic Writing Skills

Sentence Structures
Use of clauses in sentences
Punctuation
Creating coherence and learning parallelism
Organizing principles of paragraphs in documents

Unit III : Identifying Common Errors in Writing

Subject-verb agreement
Noun-pronoun agreement
Misplaced modifiers
Articles
Prepositions
Tenses and Connectives
Relative Clauses
Doing away with Redundancies

Unit-IV: Reading Practices and Technical Writing

- "Uncle Podger Hangs the Picture" by Jerome K. Jerome
<https://www.rssenglishworld.com/2023/03/uncle-podger-hangs-picture-by-jerome-k.html>
- "The Lottery Ticket" by Anton Checkov
<https://www.classicshorts.com/stories/lottery.html>
- "The Son" by Hermann Hesse
<https://www.ereadingworksheets.com/short-stories/the-son/the-son.pdf>
- "The Secret of Work" by Swami Vivekananda
https://www.ramakrishnavivekananda.info/vivekananda/volume_1/karma-yoga/secret_of_work.htm
- Summarizing and Précis Writing
- Techniques for writing emails, notices, circulars and business letters
- Writing of Business Reports
- Writing of Statement of Purpose (SOP)

Sample List of Assignments:

- Write an email to a faculty requesting to work under them as research interns, ensuring clarity, proper etiquette, precision and concise and effective communication.
- Write a precise and accurate technical description of an engineering component, system or process, focusing on clarity and attention to detail.
- Prepare a report that identifies and analyzes an engineering problem, proposes potential solutions, and recommends the best course of action
- Write critical summaries of the literary texts mentioned from (a) to (d) in the Unit-IV

Recommended Readings:

- Kul Bhushan Kumar, *Effective Communication Skills*, Khanna Book Publishing, 2022.
- Michael Swan, *Practical English Usage*. OUP, 1995.
- Nitin Bhatnagar and Mamta Bhatnagar, *Communicative English for Engineers and Professionals*, Pearson Education, 2013.
- M. Ashraf Rizvi, *Effective Technical Communication*. Mc Graw Hill Education, 2014.
- William Zinsser, *On Writing Well*. Harper Resource Book. 2001
- L.A Hill, *A Guide to Correct English*. London, OUP, 1965
- Sanjay Kumar and Pushp Lata, *Communication Skills*. Oxford University Press. 2011.
- Exercises in Spoken English*. Parts. I-III. CIEFL, Hyderabad. Oxford University Press.
- Saumya Sharma. *Common Errors in Everyday English*, OUP, 2017.
- Common Errors in English and How to Avoid Them*, Harper Collins Publishers, 2013
- Shalini Verma, *Technical Communication for Engineers*. Vikas Publishing House, 2015
- The Pitman Book of Synonyms & Antonyms*, Fifth Edition, a.h. wheeler & co.,(p)limited, 1971.

Alternative NPTEL/SWAYAM Course:

Sr. no	NPTEL Course Name	Instructor	Host Institute
1.	Speaking Effectively	Prof. Anjali Gera Roy	IITKGP
2.	English Language For Competitive Exam	Prof. Aysha Iqbal	IIT MADRAS
3.	Technical English For Engineers	Prof. Aysha Iqbal	IIT MADRAS

Scheme of End Semester Examination (Major Test):

1. The duration of examination will be three hours.
2. Nine questions of 15 marks each will be set, out of which the examinees will have to attempt five questions.
3. First question of 15 marks will be compulsory. It will cover all the four units of the syllabus. The question will have sub- parts with marks assigned against each.
4. Question No 02 to 09 will be set from the four units of the syllabus --- two from each unit of 15 marks each. The nature of the questions in each unit will depend upon the nature of content therein. Examinees will have to attempt four more questions, selecting one from each unit. The questions may have parts.



Study Material (List) for Unit-I(Theory paper)

One Word Substitution

1. People who work together - Colleagues
2. A person belonging to one's own country - Compatriot
3. One who is completely self-satisfied - Complacent
4. One who sells sweets and pastries - Confectioner
5. Belonging to an individual from birth - Congenital
6. One who believes in keeping things and customs as they are - Conservative
7. A number of stars grouped together - Constellation
8. One who lives at the same time - Contemporary
9. A person who lives in a foreign country - Alien
10. One who takes part in sports and other activities for enjoyment only - Amateur
11. A statement that is open to more than one interpretation - Ambiguous
12. Which cannot be compared- Unique
13. A partner in crime - Accomplice
14. Written declaration made on an oath - Affidavit
15. A list of things to be discussed at a meeting - Agenda
16. One who doubts the existence of God - Agnostic/Atheist
17. One who is a habitual drunkard - Alcoholic
18. A medicine which produces insensitivity - Anaesthetic
19. A book written by an unknown author - Anonymous
20. The study of man - Anthropology
21. A medicine used to counteract poison - Antidote
22. One who studies things of the past - Antiquarian
23. A substance which kills germs - Antiseptic
24. An artificial pond or a tank used for keeping live fish, water plants, etc. - Aquarium
25. One who criticizes-Critic
26. One who knows history- Historian
27. One who is out to destroy the government - Anarchist
28. Absence of government - Anarchy
29. The science of the structure of human body - Anatomy
30. An instrument used for measuring force of the wind - Anemometer
31. A building that can touch sky-Skyscraper
32. Which is not been heard before- Unprecedented
33. One who live in Orphanage- Orphan
34. A study of ancient things - Archaeology
35. One who designs buildings - Architect
36. A place where government and public records are kept - Archive
37. A government by the nobility - Aristocracy
38. A study of stars and planets and their influence on human affairs - Astrology
39. One who is unable to pay off one's debt - Bankrupt
40. A building used for lodging soldiers - Barrack
41. Hastily erected barrier across a street - Barricade
42. One who is engaged to be married - Betrothed
43. A great lover of books - Bibliophile
44. One who can speak two languages - Bilingual
45. An instrument used by both the eyes to see a distant object in an increased shape - Binocul
46. A record of one's life written by somebody else - Biography



47. A study of plants - Botany
48. A bunch of flowers - Bouquet
49. A collection of flags - Bunting
50. A government by the officials - Bureaucracy
51. A list which contains dates and days - Calendar
52. Thing which is very necessary- Mandatory
53. One who cannot die- Immortal
54. The place where books are kept for reading- Library
55. The art of beautiful writing - Calligraphy
56. One who flies a space vehicle - Astronaut
57. One who is unmarried - Celibate
58. One who is more than hundred years old - Centenarian
59. Situation in which everything happens in a confused way - Chaotic
60. One who mends shoes - Cobbler
61. The study of stars - Astronomy
62. Animals that live in water - Aquatic
63. Space or room which is immediately below the roof of a house - Attic
64. Something that can be heard - Audible
65. A record of one's life written by oneself - Autobiography
66. A government by one - Autocracy
67. The right of self-government - Autonomy
68. A place for keeping birds - Aviary
69. An unmarried man - Bachelor
70. One who eats human flesh - Cannibal
71. The dead body of an animal - Carcass
72. One who lives on flesh - Carnivorous
73. A place with gambling tables - Casino
74. Soldiers on horses - Cavalry
75. The world in miniature - Microcosm
76. One who imitates voice and gestures of another person - Mimic
77. A place where money is coined - Mint
78. One who hates mankind - Misanthrope
79. A person who loves money and hates spending it - Miser
80. A hater of women - Misogynist
81. A rule by the mob - Mobocracy
82. One for whom the world is home - Cosmopolitan
83. One who easily believes what others say - Credulous
84. A number of sailors working on a ship - Crew
85. A war of religion - Crusade
86. One who questions everything in a negative manner - Cynic
87. A person who has been appointed or selected to attend or speak at a conference - Delegate
88. A government by the people - Democracy
89. A language of a region with its own way - Dialect
90. Shy, timid unwilling to face a situation - Diffident
91. A book which contains telephone addresses - Directory
92. A game in which no one wins - Draw
93. Extremely dry weather without rainfall - Drought
94. A person who is slow in learning - Dunce
95. One who has strange habits - Eccentric
96. Something that can be eaten - Edible

97. something that cannot be repaired: Irreparable
98. A statement open to more than one interpretations - Equivocal
99. The act of spying - Espionage
100. A study of the origin of words - Etymology
101. The science of insects: Entomology
102. The doctor who treats children: pediatrician
103. To shift people from a place of danger to a safer place - Evacuate
104. A speech made without preparation - Extempore
105. Short stories with an element of moral - Fable
106. One who is not easily pleased - Fastidious
107. One who is curious- Inquisitive
108. One who is born in a good family- Noble
109. who is omnipresent- Omnipresent
110. One who knows everything- Omniscient
111. One who is all powerful- Omnipotent
112. A disease which ends in death - Fatal
113. One who believes in fate - Fatalist
114. Animals of a certain region - Fauna
115. One who champions the rights of women - Feminist
116. One who is engaged to marry - Fiancé/Fiancée
117. A person with showy character - Flamboyant
118. A number of battle ships - Fleet
119. A number of sheep - Flock
120. Plants and vegetation of a certain region - Flora
121. Murder of a brother - Fratricide
122. Large band of stars encircling the heavens - Galaxy
123. The study of rocks and soil - Geology
124. One who thinks and talks too much about himself/herself - Egoist
125. A poem written to mourn the death of someone - Elegy
126. The most capable part of group, class of society or a country - Elite
127. The art of effective speaking - Elocution
128. A book containing information on all branches of knowledge - Encyclopaedia
129. One who is given to the pleasures of flesh - Epicurean
130. A speech made by the dramatist at the end of the play - Epilogue
131. Words inscribed on a tomb about the person buried therein - Epitaph
132. One who eats too much - Glutton
133. Storehouse of grains - Granary
134. One who is easily deceived - Gullible
135. Language that has been very much used - Hackneyed
136. A cluster of houses in a village - Hamlet
137. One who travel at night- Noctivagant
138. Whose boundary cannot be found, boundless- Boundless
139. A place for shelter of ships - Harbour
140. A place for the collection of dried plants - Herbarium
141. Descending from father to son - Hereditary
142. One who acts against religion - Heretic
143. Murder of a human being - Homicide
144. Something that cannot be described - Indescribable
145. Something that cannot be eaten - Inedible
146. Something that cannot be avoided - Inevitable

147. One who does not make mistakes - Infallible
 148. Murder of an infant - Infanticide
 149. The soldiers on foot - Infantry
 150. Liable to catch fire - Inflammable
 151. Something which cannot be imitated - Inimitable
 152. Something which cannot be satisfied - Insatiable
 153. To examine one's thoughts and feelings - Introspect
 154. Having no force, null and void - Invalid
 155. Something which cannot be conquered - Invincible
 156. A decision that cannot be taken back - Irrevocable
 157. A plan for the route to be followed - Itinerary
 158. A professional rider in horse races - Jockey
 159. One who has an irresistible tendency to steal - Kleptomaniac
 160. A place where food is kept - Larder
 161. A book of account showing debit and credit - Ledger
 162. Something which is lawful - Legal
 163. Something which can be read - Legible
 164. Number of books housed in one building - Library
 165. A document allowing persons to travel abroad - Passport
 166. Murder of a father - Patricide
 167. One who loves one's own country - Patriot
 168. One who shows too much concern for small details of learning or teaching - Pedant
 169. One who walks on foot - Pedestrian
 170. A doctor who specializes in the treatment of children - Pediatrician
 171. One who looks at the dark side of things - Pessimist
 172. One who loves mankind - Philanthropist
 173. One who collects postage stamps - Philatelist
 174. The study of languages - Philology
 175. A study of human body - Physiology
 176. One who doesn't want to work- Doodle
 177. One who is cruel- Ruthless, Merciless
 178. Pertaining/related to moon - Lunatic
 179. The house of an Eskimo - Igloo
 180. Something which is unlawful - Illegal
 181. Something which cannot be read - Illegible
 182. One who cannot read or write - Illiterate
 183. One who settles in another country - Immigrant
 184. Free from infection - Immune
 185. Not planned ahead of time - Impromptu
 186. Something which cannot be heard - Inaudible
 187. Not of good omen - Inauspicious
 188. Something that cannot be corrected - Incurable
 189. A place where mad men are kept - Lunatic asylum
 190. Name shared by all the members of a family - Surname
 191. A person's last utterance - Swan Song
 192. One who always keeps to himself - Taciturn
 193. One who does not drink wine - Teetotaler
 194. An instrument used to send messages to long distances - Telegraph
 195. An instrument which transmits spoken words to long distances - Telephone
 196. One who believes in God - Theist

197. Something through which light can partly pass - Translucent
 198. Something through which light can pass - Transparent
 199. One who changes sides - Turncoat
 200. A decision on which all agree - Unanimous
 201. A place where everything is perfect - Utopia
 202. A person who lives a wandering life - Vagabond
 203. A speech made for the first time - Maiden
 204. Animals that suckle their young ones - Mammals
 205. A book or a paper written by hand - Manuscript
 206. Killing on a large scale - Massacre
 207. Murder of a mother - Matricide
 208. Negotiating between the opposite parties to settle their dispute - Mediate
 209. Personal reminiscences in a narration form - Memoir
 210. A government by a king or a queen - Monarchy
 211. A treatise on a subject - Monograph
 212. A speech delivered by one person - Monologue
 213. A government by the few - Oligarchy
 214. Flesh- and vegetable-eating animals - Omnivorous
 215. Something through which light cannot pass - Opaque
 216. One who is able to make an eloquent speech - Orator
 217. Curved path of a planet, satellite - Orbit
 218. An authoritative decree or law of the government - Ordinance
 219. A place where clothes are kept - Wardrobe
 220. A woman whose husband is dead - Widow
 221. A man whose wife is dead - Widower
 222. An unexpected piece of good fortune - Windfall
 223. Highest point in the sky directly above the observer - Zenith
 224. Deeply religious - Pious
 225. A writer who steals ideas from another writer - Plagiarist
 226. A government by the rich - Plutocracy
 227. The science of government - Political science
 228. Mental derangement confined to one idea - Monomania
 229. Exclusive possession or control of any one thing - Monopoly
 230. A place where dead bodies are kept before they are cremated or buried - Mortuary
 231. A place where ancient works are kept - Museum
 232. Favouring one's friends and relatives - Nepotism
 233. Taking neither side in the dispute, remaining impartial - Neutral
 234. A hollow space in a wall for a statue - Niche
 235. One who is new to a profession - Novice
 236. A word no longer in use - Obsolete
 237. One who is 80-years old - Octogenarian
 238. Something which can be carried or moved easily - Portable
 239. Occurring after death - Posthumous
 240. Examination of a dead body - Post-mortem
 241. A child of unusual or remarkable talent - Prodigy
 242. A speech made by the dramatist in the beginning of the play - Prologue
 243. A person who preaches religion and is considered to be a messenger of God - Prophet
 244. To write under a different name - Pseudonym
 245. A doctor who specializes in mental illness - Psychiatrist
 246. The study of human mind - Psychology

247. One who retires from society to live a solitary life - Recluse
 248. Too much official formality - Red-tapism
 249. Bitter or ironic remark, specially one ironically worded - Sarcasm
 250. Person who is made to bear blame due to others - Scapegoat
 251. Someone who knows a lot about the subject - Scholar
 252. One who carves in stones - Sculptor
 253. A state in which all the religions have equal freedom - Secular
 254. A case in which sword is kept - Sheath
 255. A speech made to one self - Soliloquy
 256. One who walks in one's sleep - Somnambulist
 257. One who talks in one's sleep - Somniloquist
 258. An older woman who is unmarried and is not likely to get married - Spinster
 259. A sudden rush of a large number of frightened people or animals - Stampede
 260. Social position or rank - Status
 261. One who loads and unloads ships - Stevedore
 262. One who is indifferent to pain and pleasure - Stoic
 263. Murder of self - Suicide
 264. To spend life without purpose and initiative - Vegetate
 265. One who is gifted with several talents - Versatile
 266. One who offers one's services - Volunteer
 267. One who is given to the sensual pleasures of body - Voluptuary
 268. An institution meant for reforming young offenders - Reformatory
 269. Murder of the king - Regicide
 270. A place for improving one's health - Resort
 271. One who speaks less - Reticent
 272. A person who lives in a countryside far from the humdrum of society - Rustic
 273. One who gets pleasure in others' trouble or pain - Sadist
 274. A room where idols of God are kept - Sanctorum
 275. A very private room - Sanctum
 276. A study of animals - Zoology
 277. Words different in meaning but similar in sound - Homophones
 278. Serving without pay - Honorary
 279. One who is sympathetic to mankind - Humanitarian
 280. Payment for a specific work done - Remuneration
 281. One who pretends to be what he/she is not - Hypocrite
 282. A study of birds - Ornithology
 283. The study of mountains - Orology
 284. A place where orphans are housed - Orphanage
 285. One who looks at the bright side of things in life - Optimist
 286. A cure for all diseases - Panacea
 287. Belief of God in nature - Pantheism
 288. One that lives on others - Parasite

Phrasal Verbs (with examples)

1. Account for--To explain the reason for (Increased pollution may *account for* climate change)
2. Adhere to—Obey (You must *adhere to* the terms of the contract.)
3. Allude to--Mention in an indirect way (She kept *alluding to* our agreement, but she didn't want to reveal it.)

4. Bring on--To cause something bad to happen, especially illness
(His heart condition was *brought on* by his diet.)
5. Bring up-- To start discussing a subject
(She *brought* the matter *up* very late so they didn't have time to discuss it properly.)
6. Come about-- To happen, especially by chance
(Increased unemployment has *come about* through automated production.)
7. Cut back-- To reduce
(They are *cutting back* expenses.)
8. Do without-- To succeed in living or working without
(We can *do without* help from you.)
9. Embark on-- To start a new project or activity, usually one that will be difficult or take time
(After graduating from university, she *embarked on* a career in banking.)
10. Follow through-- To continue doing something until it has been completed (You will need to *follow through* with some reading if you want to master the subject.)
11. Frown upon--To not approve of something (Failure to attend classes is *frowned upon*.)
12. Get across-- To make people understand something
(The teacher managed to *get across* how important it was to attend lectures.)
13. Get around-- To be heard by a lot of people
(News of his promotion *got around* very fast.)
14. Get at-- To try to suggest something without saying it directly
(What are you *getting at*? Was my presentation too long?)
15. Get back-- To start doing something again after not doing it for a period of time
(Let's *get back* to discussing how this happened.)
16. Look forward to-- To feel happy about something that is going to happen
(I'm *looking forward to* meeting you later.)
17. Look into-- To try to discover facts about something
(After several customers complained about late deliveries, they decided to *look into* the matter.)
18. Make of--To understand someone or something in a certain way
(What do you *make of* the teacher's decision to shorten this course?)
19. Map out-- To plan in detail how something will happen
(Her career was *mapped out* for her when she decided to take that job.)
20. Meet up--To come together with someone
(Let's *meet up* and discuss how we are going to go about this project.)
21. Narrow down--To reduce the number of possibilities
(The detectives *narrowed down* the list of suspects to just two.)
22. Put forward-- To suggest an idea, opinion so that it can be discussed
(The proposals were *put forward* last week, but the committee didn't have time to discuss them.)
23. Put off-- To delay doing something especially when you don't want to do it
(Are you *putting off* writing that essay because you can't concentrate right now?)

24. Resort to--To do something unpleasant in order to solve a problem
(We must resort to *legal action* if they don't offer compensation.)
25. Rule out-- To stop considering something as a possibility
(The CEO said that yearly bonuses can be *ruled out* in light of the financial crisis.)
26. Run by-- To tell someone your ideas so they can give you their opinion (I have a few ideas for tomorrow's meeting. Can I *run* them by you?)
27. Talk out of-- To persuade someone not to do something
(Her parents *talked* her out of living in a rented flat.)
28. Think over-- To consider a problem carefully
(You should *think* it over before handing in your resignation.)
29. Turn out--To develop in a particular way
(The presentation *turned out* well, considering how little you prepared for it.)
30. Verge on-- To almost be in a particular state
(His speech was so good, it was *verging on* genius.)

Some More Phrasal Verbs (with meaning only)

1. Abide by- Respect or obey the law, a decision, a rule
2. Account for- Explain, give a reason
3. Add up- Make sense, seem reasonable
4. Agree with- Have the same opinion as somebody else.
5. Allow for- Take advantage of something (an opportunity)
6. Answer back- Reply rudely
7. Apply for- Make a formal request for something (job, permit, loan, etc.)
8. Avail (oneself) of- Take into consideration, include in a calculation
9. Back away- Move backwards, in fear or dislike
10. Back down-Withdraw, concede, defeat
11. Blow up-Explode; be destroyed by an explosion
12. Back up-Give support or encouragement; make a copy of (file, program, etc.)
13. Black out-Faint, lose consciousness
14. Block off-Separate using a barrier
15. Boil down to-Be summarized as
16. Break down- Go out of order, cease to function; lose control of one's emotions
17. Break out- Start suddenly
18. Break into- Enter by force
19. Bump into- Meet by accident or unexpectedly
20. Burn out- Stop (something) working; become exhausted from overworking
21. Butt in (on something)- Interrupt impolitely
22. Call back- Return a phone call
23. Call off- Cancel
24. Call on/upon something- Formally invite or request
25. Calm down- Become more relaxed, less angry or upset
26. Carry on- Continue
27. Carry out- Do something as specified (a plan, an order, a threat); perform or conduct(test, experiment)
28. Cut down on- Reduce in number or size

29. Cut out- Remove using scissors; stop doing something
30. Deal with- Handle, take care of (problem, situation)
31. Die down- Calm down, become less strong
32. Dress up- Wear elegant clothes; disguise oneself
33. Do without- Manage without
34. Drag on- Last longer than expected
35. Draw up- Write (contract, agreement, document)
36. Drop in- Visit, usually on the way somewhere
37. Drop out- Leave school without finishing
38. Drop off- Deliver someone or something; fall asleep
39. Ease off- Reduce, become less severe or slow down (pain, traffic, work)
40. Even out- Eliminate differences of opinion; become level or regular
41. Fall through- Fail; doesn't happen
42. Figure out- Understand, find the answer
43. Fill out- Complete (a form/an application)
44. Find out- Discover or obtain information
45. Focus on- Understand; find a solution
46. Figure out- Concentrate on something
47. Get at- Imply
48. Check in- Register at a hotel or airport
49. Check out- Pay one's bill and leave (a hotel); investigate
50. Clam up- Refuse to speak
51. Close down- Stop operating (company, restaurant, cinema)
52. Come across- Find by chance; appear
53. Come forward- Present oneself
54. Conk out- Stop working; stop or fall asleep from exhaustion
55. Come up against- Be faced with or opposed by
56. Count on- rely or depend on (for help)
57. Cross out- Remove by drawing a line through
58. Get on (well) with (somebody)- Have a good relationship with
59. Get out of- Avoid doing something
60. Get over- Recover from (illness, disappointment)
61. Give up- Stop doing something
62. Get rid of- Eliminate
63. Get together- Meet each other
64. Get up- Rise, leave bed
65. Go through- Experience
66. Grow up- Spend one's childhood; develop; become an adult
67. Hand in- Distribute
68. Hand out- Submit (report, homework)
69. Hang out- Spend time in a particular place, or with a group of friends
70. Hang up- End a phone conversation
71. Hit at- Aim a blow at
72. Hit back- Retaliate; reply to an attack
73. Hit on/upon- Find unexpectedly or by inspiration
74. Hold on- Wait; grip tightly
75. Hurry up- Be quick, act speedily
76. Iron out- Resolve by discussion, eliminate differences

77. Join in- Participate
78. Get away- Escape
79. Get back at- To get revenge on somebody
80. Get in- Enter
81. Get into (+noun)- Manage to cope or to survive
82. Get off- Leave (bus, train, plane); remove
83. Get on- Board (bus, train, plane)
84. Get on with (something)- Continue to do; make progress
85. Get out- Leave
86. Join up- Engage in, become a member of, meet and unite with
87. Jot down- Take quick notes
88. Keep on- Continue doing something
89. Keep up with- Stay at the same level as someone or something
90. Kick off- Begin, start
91. Leave out- Omit, not mention
92. Let down- Disappoint
93. Look after- Take care of
94. Look ahead- Think of the future
95. Look down on- Consider as inferior
96. Look on- Be a spectator at an event
97. Look for- Try to find something
98. Look forward to- Await or anticipate with pleasure
99. Look up to- Admire
100. Make fun of- Laugh at/ make jokes about
101. Make up- Invent (excuse, story)
102. Mix up- Mistake one thing or person for another
103. Move in- Arrive in a new home or office
104. Move out- Leave your home/office for another one.
105. Nod off- Fall asleep
106. Note down- Write something
107. Opt out- Leave a system or decide not to participate
108. Own up- Admit or confess something
109. Pass away- Die
110. Rule out- Eliminate
111. Run away- Escape from a place or suddenly leave
112. Run into- Meet by accident or unexpectedly (also- bump into)
113. Run out of- Have no more of something.
114. Set off- Start a journey
115. Set up- Start a business
116. Shop around- Compare prices
117. Show off- Brag or want to be admired
118. Show up- Appear/arrive
119. Stick up for- Defend
120. Take after- Resemble, in appearance or character
121. Take care of- Look after
122. Take off- Leave the ground
123. Take on- Hire or engage staff
124. Tell off- Reprimand/criticize severely

125. Think over- Consider.
126. Pass out- Faint
127. Pay back- Reimburse
128. Put off- Postpone, arrange at a later date
129. Put on- Turn on, switch on
130. Put out- Extinguish
131. Put up- Accommodate, give somebody a bed
132. Pick up- Collect somebody
133. Point out- Indicate/direct attention to something
134. Rely on- Count on, depend on, trust
135. Try on- Wear something to see if it suits or fits
136. Turn down- Refuse
137. Use up- Finish a product (so that there's none left)
138. Vouch for- Express confidence in, or guarantee something
139. Watch out- Be careful
140. Wear out- Become unusable, Become very tired
141. Work out- Do physical exercise, Find a solution or calculate something
142. Wipe off- Clean (board, table)

Commonly Used Idioms

1. As easy as pie - very easy (same as "a piece of cake")
2. Be sick and tired of -- to detest, to abhor (also "can't stand")
3. Bend over backwards-- try very hard (maybe too much!)
4. Bite off more than one can chew- "take responsibility for more than one can manage"
5. Broke- to have no money
6. A bed of roses- A comfortable position
7. A bed of thorns- An uncomfortable position.
8. A bird in the hand is worth two in the bush- Having something that is certain is much better than taking a risk for more.
9. A bird's eye view- A brief general view
10. A blessing in disguise- Something good that isn't recognized at first
11. A bolt from the blue- Any calamity that overtakes somebody suddenly.
12. A chicken-hearted fellow- A timid person.
13. Achilles heel- A point of vulnerability
14. A red letter day- An important day
15. A slap on the wrist- A very mild punishment
16. A snake in grass- A deceitful person
17. A taste of your own medicine- When you are ill-treated the same way you ill-treat others.
18. At loggerheads- Engaged in a head-on dispute.
19. Actions speak louder than words- It's better to do something in reality than just talk about it.
20. Add fuel to the fire- To do something to make a bad situation even worse than it is.
21. Against the clock- To do something fast to finish it before a particular time.
22. All bark and no bite- Someone is threatening or aggressive but not willing to engage in a fight.
23. All Greek to me- Meaningless and incomprehensible like someone who cannot read, speak, or understand any of the Greek languages.

24. All in the same boat- When everyone is facing the same challenges.
25. An axe to grind- To have a dispute with someone.
26. An apple of someone's eye- Someone who is cherished above all others.
27. As high as a kite- Anything that is high up in the sky.
28. At the drop of a hat- Willing to do something immediately.
29. Back-seat driver- People who criticize from the sidelines, much like someone giving unwanted advice from the back seat of a vehicle to the driver.
30. Back to square one- Having to start all over again.
31. Beat a dead horse- To force an issue that has already ended.
32. Beating about the bush- Avoiding the main topic, not speaking directly about the issue.
33. Between a rock and a hard place- Stuck between two very bad options.
34. Burn the midnight oil- To stay awake late at night to work or to study.
35. By hook or by crook- By whatever means possible, fair or unfair.
36. A doubting Thomas- A skeptic who needs physical or personal evidence to believe something.
37. A drop in the bucket- A very small part of something.
38. A fair weather friend- One who betrays in difficulty.
39. A fish out of water- A person in uncomfortable surroundings.
40. A fool and his money are easily parted- It is easy for a foolish person to lose his/her money.
41. A hen-pecked husband- A person servile to his wife.
42. A leopard can't change his spots- You cannot change what you are.
43. A penny saved is a penny earned- Saving money little by little.
44. A picture paints a thousand words- A visual presentation is far more descriptive than words.
45. A piece of cake- A task that can be accomplished very easily.
46. Chew someone out- To scold someone verbally.
47. Cock and bull story- An unbelievable tale.
48. Crocodile tears- Pretending to be sad, in an attempt to manipulate the situation.
49. Cross your fingers- To hope that something happens the way you want it to.
50. Cry over spilt milk- When you complain about a loss from the past.
51. Cry wolf- Intentionally raise a false alarm.
52. Curiosity killed the cat- Being inquisitive can lead you into a dangerous situation.
53. Dark horse- One who was previously unknown and is now prominent.
54. Devil's advocate- Someone who takes a position for the sake of argument without believing in that particular side of the argument.
55. Don't count your chickens before they hatch- Don't rely on something until you are sure of it.
56. Don't put all your eggs in one basket- Do not put all your resources in one possibility.
57. Drastic times call for drastic measures- When you are extremely desperate you need to take extremely desperate actions.
58. Draw the line- To set a limit, as of accepted behaviour.
59. Drink like a fish- To drink very heavily.
60. Bite off more than you can chew- To take on a task that is way to big.
61. Bite your tongue- To avoid talking.
62. Black sheep- A person who is considered a disgrace to a family.
63. Blood is thicker than water- The family bond is closer than anything else.
64. Blow one's own horn- To praise your own abilities and achievements.
65. Blue moon- A rare event or occurrence.
66. Break the ice- To remove the tension, hesitation at the first meeting or at the opening of a party, etc.
67. Drive someone up the wall- To irritate and/or annoy very much.
68. Dropping like flies- A large number of people either falling ill or dying.
69. Every cloud has a silver lining- Be optimistic, even difficult times will lead to better days.
70. Everything but the kitchen sinks- Almost everything and anything has been included.

71. Eye for eye- Revenge.
72. Feather in one's hat- An accomplishment a person can be proud of.
73. Field day- An enjoyable day or circumstance.
74. Finding your feet- To become more comfortable in whatever you are doing.
75. Fixed in your ways- Not willing to change from your normal way of doing something.
76. Flash in the pan- Something that looks promising in the beginning but fails to deliver anything in the end.
77. Flesh and blood- Material of which people are made of, or it can refer to someone's family.
78. Fools' gold- A worthless rock that resembles real gold.
79. From pillar to post- From one place or thing to another.
80. From rags to riches- To go from being very poor to being very wealthy.
81. Fuddy-duddy- An old-fashioned and foolish type of person.
82. Chip on his shoulder- Angry today about something that occurred in the past.
83. Chip off the old block- People who closely resemble their parents in some way or the other.
84. Change one's mind - decide to do something different from what had been decided earlier
85. Cut it out! - stop doing something bad
86. Drop someone a line- send a letter or email to someone
87. Figure something out means- come to understand a problem
88. Fill in for someone-- do their work while they are away
89. Clean slate- To make a new start by clearing records
90. Get over it- To move beyond something that is bothering you
91. Get up on the wrong side of the bed- Someone who has a horrible day
92. Give him the slip- To get away from, to escape.
93. Go down like a lead balloon- To be received badly by an audience.
94. Go out on a limb- Put yourself in a tough position to support someone/something.
95. Go the extra mile- Making extra efforts for the task at hand.
96. Great minds think alike- Intelligent people think like each other.
97. Green room- The waiting room, especially for those who are about to go on stage, a TV or radio.
98. Gut feeling- A personal intuition that something may not be right.
99. Hit the books- To study, especially for a test or exam
100. Hit the nail on the head- Do something exactly right or say something exactly right
101. Hold your horses- Be patient
102. Icing on the cake- Something extra that is added to an already good situation
103. Idle hands are the devil's tools- You are more likely to get into trouble if you have nothing to do
104. Smell a rat- To detect someone in the group who is betraying others
105. Coming events cast their shadows before- Significant events are often preceded by signs that they are about to happen
106. Smell something fishy- Detecting something isn't right
107. Southpaw- Someone who is left handed
108. Spitting image- The exact likeness or kind
109. Start from scratch- To do it all over again from the beginning
110. Strike while the iron is hot- Act quickly when the opportunity is still available
111. The ball is in your court- It is your decision this time
112. The best of both worlds- There are two choices and you have them both
113. The bigger they are the harder they fall- While the bigger and stronger opponent might be a lot more difficult to beat
114. If it's not one thing, it's another- When one thing goes wrong, then another, and another.
115. In the heat of the moment- Overwhelmed by what is happening in the moment.
116. Haste makes waste- Quickly doing things results in a poor ending
117. Hat trick- Three scores made continuously without break in a sport, such as

- three wickets in cricket or three soccer goals.
118. Have a finger in every pie- To be involved in a lot of different activities and have influence over them
119. He lost his head- Angry and overcome by emotions
120. Head over heels- Very excited and/or joyful, especially when in love
121. Hell in a hand basket- Deteriorating and headed for complete disaster
122. Hit below the belt- An unfair or cruel remark
123. It takes two to tango- A two-person conflict where both people are at fault.
124. It's a small world- You frequently see the same people in different places.
125. It's anyone's call- A competition where the outcome is difficult to judge or predict.
126. Jack of all trades master of none- Someone good at many things but excellent at nothing.
127. Keep an eye on somebody- You should watch a person carefully.
128. In ages - for a very long time
129. Give someone a hand - to help
130. Hit the hay - go to bed (also hit the sack)
131. In the black - the business is making money, it is profitable
132. In the red - the business is losing money, it is unprofitable
133. Keep body and soul together- To earn a sufficient amount of money to keep yourself alive.
134. Keep your chin up- To remain joyful in a tough situation
135. Kitty-corner- Diagonally across, sometimes called Catty-Corner as well
136. Knee jerk reaction- A quick and automatic response
137. Knock on wood- Knuckle tapping on wood to avoid some bad luck
138. Know the ropes- To understand the details
139. Last but not the least- An introduction phrase to let the audience know that the last person mentioned is no less important than those introduced before him/her.
140. Off the hook- No longer have to deal with a tough situation
141. Off the record- Something said in confidence that the one speaking doesn't want attributed to him/her
142. Practice makes perfect- By constantly practicing, you will become better.
143. Pull the plug- To stop something, to bring something to an end
144. Pulling your leg- Tricking someone as a joke
145. Put a sock in it- To tell noisy person or a group to be quiet
146. Queer the pitch- Destroy or ruin a plan
147. Raining cats and dogs- A very loud and noisy rain storm
148. Read between the lines- To pay attention to what is implied in writing or speech
149. Ring fencing- To protect a particular sum of money by putting restrictions on its use
150. Rise and shine- Time to get out of bed and get ready for work/school
151. Rome was not built in one day- If you want something to be completed properly, then it is going to take time.
152. On pins and needles- Anxious or nervous, especially in anticipation of something
153. On the fence- Undecided
154. On the same page- When multiple people all agree on the same thing
155. Let the cat out of the bag- To share a secret that wasn't supposed to be shared
156. Level-playing field- A fair competition where no side has an advantage
157. Like a chicken with its head cut off- To act in a frenzied manner
158. Liquor someone up- To get someone drunk
159. Loose cannon- Someone who is unpredictable and can cause damage if not kept in check
160. Maiden speech- The first speech made by a person
161. Lend me your ear- To politely ask for someone's full attention

162. Let bygones be bygones- To forget about a disagreement or argument
163. Let sleeping dogs lie- To avoid restarting a conflict
164. Nest egg- Savings set aside for future use
165. Never bite the hand that feeds you- Don't hurt anyone who helps you.
166. New kid on the block- Someone new to the group or area
167. No dice- Not to accept a proposition
168. No room to swing a cat- An unusually small or confined space
169. Not playing with a full deck- Someone who lacks intelligence
170. Off on the wrong foot- Getting a bad start on a relationship or task.
171. Make no bones about- To state a fact so there are no doubts or objections
172. Mumbo jumbo- Nonsense or meaningless speech
173. Out of the blue- Something that suddenly and unexpectedly occurs.
174. Out on a limb- When people put themselves in a risky situation.
175. Out on the town- To enjoy yourself by going out
176. Rule of thumb- A rough estimate
177. Run out of steam- To be completely out of energy
178. Saved by the bell- Saved at the last possible moment
179. Scapegoat- Someone else who takes the blame
180. Show your true colours- To reveal your true intentions, personality or behaviour
181. Sick as a dog- To be very sick (with the flu or a cold)
182. Sitting shotgun- Riding in the front passenger seat of a car
183. Sixth sense- Intuition; a special ability to know something without using any of the five senses
184. The last straw- When one small burden after another creates an unbearable situation, the last straw is the last small burden that one can take.
185. The whole nine yards- Everything
186. Third times a charm- After no success the first two times, the third try is a lucky one.
187. Tie the knot- To get married
188. Turn a blind eye- Refuse to acknowledge something you know is real or legitimate
189. Under the weather- Feeling ill or sick
190. Up a blind alley- Going down a course of action that leads to a bad outcome
191. Use your loaf- Use your head / Think smart
192. Over the top- Highly excessive
193. Pass the buck- Avoid responsibility by giving it to someone else
194. Pedal to the metal- To go full speed, especially while driving a vehicle
195. Peeping Tom- Someone who observes people in the nude or sexually active people, mainly for his own gratification.
196. Pick up your ears- To listen very carefully
197. Pig out- To eat a lot and eat it quickly
198. Pipe down- To shut up or be quiet
199. Pour oil on troubled waters- To calm a disturbance
200. Variety is the spice of life- The more experiences you try the more exciting life can be
201. Wag the dog- A diversion away from something of greater importance
202. Water under the bridge- Anything from the past that isn't significant or important anymore
203. Wear your heart on your sleeve- To openly and freely express your emotions
204. When pigs fly- Something that will never ever happen
205. Wild and woolly- Uncultured and without laws
206. Wine and dine- When somebody is treated to an expensive meal
207. Without a doubt- For certain

208. X marks the spot- A phrase that is said when someone finds something he/she has been looking for
209. You are what you eat- To stay healthy you must eat healthy food
210. You can't judge a book by its cover- Decisions shouldn't be made primarily on appearance.
211. Your guess is as good as mine- I have no idea.
212. Young Turk- An insurgent person trying to take control of a situation
213. Zero tolerance- The policy of applying laws very strictly so that people are punished even for mild offences
214. To be in one's good books- To be favoured
215. To build castles in the air- Imaginary projects
216. To nip in the bud- To put a stop to a thing in the beginning
217. To call a spade a spade- To be plain and outspoken
218. To carry the day- To be victorious
219. To eat humble pie- To have to apologize
220. To pay lip service- To pretend to be faithful
221. To steal someone's thunder- To take the credit for something someone else did
222. To the backbone- Thoroughly
223. Tongue and cheek- Humour, not to be taken seriously

Foreign Words/Expressions Commonly Used in English

Foreign Words	Language & Meaning
Ab initio	Latin. From the beginning
Ad hoc	Latin. For the specific purpose, case or situation at hand
Ad libitum	Latin. At the discretion of the performer
Affaire d'amour	French. A love affair
Aide de camp	French. A military officer acting as secretary and confidential assistant to the superior of general or flag rank
Alma mater	Latin. The school, college or a university that one has attended
Anno Domini	Latin. In a specified year of the Christian era
Ante meridiem	Latin. Before Noon
Au revoir	French. Used to express farewell
Billet-doux	French. A love letter
Bona fide	Latin. Made or carried out in good faith; sincere
Boulevard	French. A broad city street. Often tree-lined and landscaped
Bourgeoisie	French. The middle class

Coup d'etat	French. The sudden overthrow of a government, usually by a small group of persons in or previously in positions of authority
Cuisine	French. A characteristic manner or style of preparing food
De facto	Latin. In reality or fact
De jure	Latin. According to law
Exempli gratia	Latin. For example
En masse	French. In one group or body; altogether
En route	French. On or along the way
Erratum	Latin. An error in printing or writing especially such an error noted in a list of corrections and bound into a book
Et cetera	Latin. And other unspecified things of the same class; and so forth
Ex officio	Latin. By virtue of office or position
Extempore	Latin. Spoken, carried out or composed with little or no preparation or forethought
Fait accompli	French. An accomplished, presumably irreversible deed or fact
Gourmet	French. A connoisseur of fine food and drink
Gratis	Latin. Without charge
Habeas corpus	Latin. One of a variety of writs that may be issued to bring a party before a court or judge, having as its function the release of the party from unlawful restraint.
Ibidem	Latin. In the same place. Used in footnotes and bibliographies to refer to the book, chapter, article, or page cited just before.
Id est	Latin. That is to say.
Impasse	French. 1) A road or passage having no exit; 2) A situation that is so difficult that no progress can be made; a deadlock or a stalemate.
In absentia	Latin. While or although not present; in absence.
In memoriam	Latin. In memory of; as a memorial to
In toto	Latin. Totally; altogether
Laissez-faire	French. 1) Noninterference in the affairs of others; 2) An economic doctrine that opposes governmental regulation of or interference in commerce beyond the minimum necessary for a free-enterprise system to operate according to its own economic laws.
Magnum opus	Latin. A great work especially a literary or artistic masterpiece.

Nom de plume	French. Pen-name; assumed name used by a writer instead of original name.
Persona grata	Latin. Fully acceptable or welcome especially to a foreign government
Post meridiem	Latin. Afternoon; used chiefly in the abbreviated form to specify the hour
Post-mortem	Latin. Of or relating to a medical examination of a dead body.
Prima facie	Latin. At first sight; before closer inspection
Pro bono	Latin. Done without compensation for the public good.
Pro rata	Latin. In proportion, according to a factor that can be calculated exactly.
Pro tempore	Latin. For the time being; temporarily
Quasi	Latin. Having likeness to something; resembling
Répondez s'il vous plaît	French. Please reply
Résumé	French. A brief account of one's professional or work experience and qualification
Sangfroid	French. Coolness and composure, especially in trying circumstances
Status quo	Latin. The existing condition or state of affairs
Sine die	Latin. Without a day specified for a future meeting; indefinitely
Sine qua non	Latin. An essential element or condition
Tete-a-tete	French. Without the intrusion of a third person; in intimate privacy
Verbatim	Latin. Using exactly the same words; corresponding word for word
Versus	Latin. Against
Via	Latin. By way of
Vide	Latin. Used to direct a reader's attention
Vice versa	Latin. With the order or meaning reversed; conversely
Vis-a-vis	French 1) Face to face; with opposite to, 2) compared with, 3) in relation to
Viva voce	Latin. By word of mouth
Vox populi	Latin. Popular opinion or sentiment

Course Objectives:

1. To develop the desired English language skills, especially speaking and listening of the students
2. To make students excel in their professional lives through proficiency in communication
3. To enhance their linguistic and communicative competence

Course Outcomes:

The students will be able to:

1. Acquire basic proficiency in spoken English and polish their speaking skills in English for social as well as professional settings
2. Enhance their listening skills with listening comprehension exercises
3. Present themselves confidently and meaningfully in professional and social circles
4. Develop their Speaking skills with clarity and confidence which in turn enhances their employability skills

Course Contents:

Practical 1	Listening: Dos and Don'ts
Practical 2	Listening for general content, Listening to fill up information, Intensive listening, Listening for specific information
Practical 3	Recognition of phonemes in International Phonetic Alphabet(Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds)
Practical 4	Self- introduction and Introduction of another person
Practical 5	Conversation and dialogues in common everyday situations
Practical 6	Mechanics of Good Dialogues/ Effective Communication at Work Place (Standard phrases and sentences in various situations)
Practical 7	Telephonic Communication
Practical 8	Speeches for Special occasions --Welcome Speeches and Introduction Speeches
Practical 9	Speeches for Special occasions-- Felicitation Speeches and Farewell Speeches
Practical 10	Tag Questions
Practical 11	Etiquettes in Business and Social spheres & Importance of Body Language
Practical 12	Group Discussion: Theory and Practice
Practical 13	Interview Skills: Preparing for Interviews, Mock Interviews
Practical 14	Formal Business Presentations
Practical 15	Making small presentations on the texts prescribed in Unit IV of the Theory Paper: "Uncle Podger Hangs the Picture" by Jerome K. Jerome & "The Lottery Ticket" by Anton Checkov
Practical 16	Making small presentations on the texts prescribed in Unit IV of the Theory Paper: "The Son" by Hermann Hesse & "The Secret of Work" by Swami Vivekananda

The students are supposed to make a file for all the practical topics conducted in the class during the entire semester in Lab/practical class sessions. They should be encouraged to make and keep ready small PPTs of minimum 6 and maximum 10 slides on practical 15 and 16 for the day of end semester practical exam.

Recommended Readings:

1. Nitin Bhatnagar and Mamta Bhatnagar. *Communicative English for Engineers and Professionals*. Pearson Education, 2013.
2. Michael Swan, *Practical English usage*. OUP, 1995.
3. J. K. Gangal, *Practical Course in Spoken English*. New Delhi: PHI Learning, 2015.
4. Konar, Nira. *Communication Skills for Professionals*. New Delhi: PHI Learning Pvt. Ltd., 2009.
5. R.K. Bansal, and J.B. Harison. *Spoken English*. Orient Black Swan, 1983.
6. Sharma, Sangeeta and Binod Mishra. *Communication Skills for Engineers and Scientists*. Delhi: PHI Learning Pvt. Ltd., 2015.
7. J. Sethi and P. V. Dhamija, *A Course in Phonetics and Spoken English*. Prentice Hall India Pvt. Ltd., 1999.
8. T. Balasubramanian, *A Textbook of English Phonetics for Indian Students*. Laxmi Publication (3rd edition), 2017.

Course Title: Medical Physiology for Engineers		Internal marks:25
Title of the course		External marks 75
L	T	P
4	-	-
Credits 03		Maximum marks 100
		Duration of exam 3 hrs
<p>Medical Physiology for Engineers is a basic course on medical physiology that will make the students aware about the basic cell organization, human organ systems and application of engineering in the betterment of the medicine for diagnosis and disease treatments. It aids in developing interdisciplinary skills essential for advancing technology. Human physiology is crucial for engineers as it enables the application of engineering principles to biological systems, fostering interdisciplinary problem-solving skills in various specializations.</p>		
<p>COURSE OBJECTIVES:</p> <ul style="list-style-type: none"> ➤ To familiarize the students with the basic physiological concepts and their engineering applications. ➤ To enable the students with an understanding of bio design principles to create novel devices and structures. ➤ To provide the students an appreciation of how biological systems can be re-designed as substitute products for natural systems. ➤ To motivate the students, develop the interdisciplinary vision of biological engineering. 		
UNIT-I(Lectures 10)		
BASIC CELL BIOLOGY AND BIOMOLECULES		
Basic Cell structure and functions. Types of Tissues and their classification, Organ Systems and Classification. Homeostasis.		
Biomolecules: Carbohydrates (PHA and PLA as bioplastics), Nucleic acids (DNA and RNA Vaccines, Forensics – DNA fingerprinting), Proteins (Protein in cell signaling), lipids (biodiesel), Enzymes (glucose-oxidase in biosensors).		
UNIT-II(Lectures-10)		
HUMAN ORGAN SYSTEMS AND BIODESIGNS-I		
Basic structure and functions of Human Brain, Brain as a CPU system (classification of Nervous system, Nerve Impulse and its propagation: Resting membrane potential, Action Potential, Generation and Propagation) Biological signals (EEG/EMG) their role in health care analysis (Engineering solutions for Parkinson's disease).		
Heart as a pump system (architecture, electrical signaling – ECG monitoring and heart related issues, reasons for blockages of blood vessels, design of stents, pacemakers, and defibrillators).		
UNIT-III(Lectures-10)		
HUMAN ORGAN SYSTEMS AND BIO-DESIGNS-II		
Lungs as purification system (architecture, gas exchange mechanisms, spirometry, abnormal lung physiology - COPD, Ventilators, Heart-lung machine).		
Kidney as a filtration system (architecture, mechanism of filtration, CKD, dialysis systems). Muscular and Skeletal Systems as scaffolds (architecture, mechanisms, bioengineering solutions for muscular dystrophy and osteoporosis).		
UNIT-IV(Lectures-10)		
TRENDS IN BIOENGINEERING		
Bioprinting techniques and materials, 3D printing of ear, bone and skin. 3D printed foods. Electrical tongue and electrical nose in food science.		
Medical Imaging: Basic Principles and working of various medical imaging modality: X-ray, CT Scan, MRI, PET Scan, Ultrasonography, color Doppler, Echocardiography, nuclear medical imaging.		

Text Books

1. Anatomy and Physiology, Ross and Wilson, 14th Edition, Elsevier International Edition.
2. Handbook of Biomedical Instrumentation, R.S. Khandpur, 3rd Edition.
3. Human Physiology, Stuart Fox, Krista Rompolski, McGraw-Hill Book. 16th Edition, 2022.
4. Biology for Engineers, Thyagarajan S., Selvamurugan N., Rajesh M.P., Nazeer R.A., Thilagaraj W., Barathi S., and Jaganthan M.K., Tata McGraw-Hill, New Delhi, 2012.
5. 3D Bioprinting: Fundamentals, Principles and Applications by Ibrahim Ozbolat, Academic Press, 2016
6. Biology for Engineers, Sohini Singh and Tanu Allen, Vayu Education of India, New Delhi, 2014.

Reference Books.

1. Biology for Engineers, Arthur T. Johnson, CRC Press, Taylor and Francis, 2011
2. Biomedical Instrumentation, Leslie Cromwell, Prentice Hall 2011.
3. Biomimetics: Nature-Based Innovation, Yoseph Bar-Cohen, 1st edition, 2012, CRC Press.
4. Electronic Noses and Tongues in Food Science, Maria Rodriguez Mende, Academic Press, 2016

COURSE OUTCOMES

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

- Elucidate the basic biological concepts via relevant industrial applications and case studies.
- Evaluate the principles of design and development, for exploring novel bioengineering projects.
- Corroborate the concepts of biomimetics for specific requirements.
- Think critically towards exploring innovative bio-based solutions for socially relevant problems.

NOTE:

The paper setter will set two questions (with/without parts) from each unit, the first question will be compulsory and comprising of 5 to 10 sub-parts, covering the entire syllabus.

The examinee will attempt 5 questions in all, along with the compulsory question, selecting one question from each unit. All questions will carry equal marks.

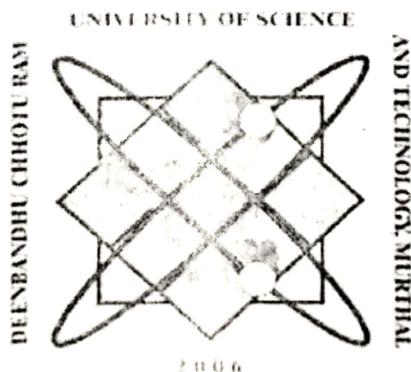


CURRICULUM
for
Universal Human Values-II (UHV-II)
(Scheme & Syllabi for First and Second semesters)

for
UNDERGRADUATE DEGREE
COURSE

IN
Bachelor of Technology
(B.Tech.)
(Common for All Branches)

[w.e.f. 2024-25]



DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE AND TECHNOLOGY
(Established Under Haryana Legislature Act No. 29 of 2006)
Murthal-131039, Sonapat (Haryana)
www.dcrust.ac.in

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY MURTHAL
(SONEPAT) HARYANA-131039
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
B. Tech 1st year Course
 (Effective from Session 2024-25)

Course Code: ESECE101D	Internal Marks: Theory: 25, Lab: 15
Title of the Course: Basics of Analog and Digital Electronics	External Marks: Theory: 50, Lab: 10
L-T-P: 3-0-2	Maximum Marks: 100
Credits: 4	Duration of Exam: 3Hrs

About the Course:

This is the beginning course of electronics and communication studies. After studying this course the students get acquainted with the basic components and circuits used in electronics and communication. The students will get an opportunity to study diodes, transistors, Logic gates, flip flops, and multiplexers. These components/circuits are the building blocks of very complicated equipment and machinery. The hands-on experience in the laboratory will add to the practical skills of the students. This course will be quite useful in their future study courses.

Course Objectives (CO):

1. To learn about semiconductors, diodes, and their applications.
2. To illustrate characteristics of BJT and FET.
3. To solve Boolean functions, their simplification, and digital circuit logic gates.
4. To analyze & design combinational and sequential circuits

UNIT-I (Lecture- 12)

Introduction of Semiconductor:

Theory of semiconductor, Types of impurities. Intrinsic and extrinsic semiconductor, P-N junction diode, LED, LCD, phototransistor, Solar Cell.

Diodes and Applications:

Junction diode characteristics: Ideal vs Practical diode, V-I characteristics of a Diode, P-N junction diode as rectifier, Half wave rectifier, Full wave rectifier with and without filter, breakdown mechanism, Zener diode: operation and applications.

UNIT-II (Lecture- 10)

Transistor:

BJT: Construction, operation, CB, CE, CC. BJT configuration with input and output characteristics.

Unipolar Junction Transistor:

JFET: Construction, operation and characteristics of JFET, Introduction to MOSFET: NMOS, PMOS, CMOS.

UNIT-III (Lecture-10)

Binary Logic:

Boolean Algebra, Boolean Theorems, Boolean expressions (SOP & PCS form) and its simplification using Boolean algebra and k-map (upto 4 variables)

Product of sum
 sum of products

SYLLABUS (FORMAT)

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY
MURTHAL (SONEPAT) HARYANA-131039
DEPARTMENT OF MANAGEMENT STUDIES
in All Engineering Branch B. Tech First Year (First Semester Course)
(Effective from Session 2024-25)

Course Code : HMMGT101D	Internal Marks :40
Title of the Course: Economics for Engineering	External Marks:60
L-T-P: 3-1-0	Maximum Marks:100
Credits: 4	Duration of Exam:3 Hours

Course Objective (CO):

Enable students to understand the economics principles applicable to engineering. To learn the techniques of economic decision making and familiarize the students with basic fundamentals of Indian financial economy.

UNIT-I (Lecture- 15)

Concept of Economics- various definitions, nature of Economic problem, Micro and macro economics- their features and scope, production possibility curve, Relationship between Science, Engineering Technology and Economics. Utility: Concept and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility – its importance and practical applications.

UNIT-II (Lecture- 15)

Demand: Concept, Individual and Market demand schedule, Law of demand, shape of demand curve. Elasticity of demand: Concept, measurement of elasticity of demand, factors affecting elasticity of demand, practical application of elasticity of demand. Various concepts of cost-Fixed cost, variable cost, average cost, marginal cost, money cost, real cost, opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

UNIT-III (Lecture- 10)

Meaning of production and factors of production; Law of variable proportions, Law of Return to Scale, Internal and External economics and diseconomies of scale. Meaning of Market, Type of Market– perfect Competition, Monopoly, Oligopoly, Monopolistic competition (Main features of these markets).

UNIT-IV (Lecture-10)

Supply and Law of Supply, Role of Demand & Supply in Price Determination and effect of changes in demand and supply on price. Nature and characteristics of Indian economy, privatization – meaning, merits and demerits. Globalisation of Indian economy – meaning, merits and demerits.

Text Books and Reference books:

N. Gregory Mankiw. Principles of Microeconomics,

Krugman, Paul, and Robin Wells. Microeconomics. New York, NY

WG Sulliman, EM Wicks and CP Koelling, Engineering Economy, Pearson

Chan S Park, Fundamentals of Engineering Economics, Always Learning

Anindya Sen, Microeconomics, OUP India

SYLLABUS

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY
MURTHAL (SONEPAT) HARYANA-131039
DEPARTMENT OF MATHEMATICS
B.Tech. (Computer Science & Engg.)
Semester- II
(Effective from Session 2024-25)

Course Code : BSMAT104D	Internal Marks :15+ 25 =40
Category: Basic Science Course	
Title of the Course: Mathematics - II	External Marks: 60
L-T-P: 3-1-0	Maximum Marks: 100
Credits: 4	Duration of Exam: 3 Hours
About the Course: This course provides the mathematical tools to analyse the data and make decisions accordingly. The various concepts of statistics included in the syllabus are instrumental in making decisions in stock markets, financial organisations etc. By knowing these concepts, the students of IT and CSE will be able to develop computer programs required for making decisions, forecast on the basis of data available.	
Course Objective (CO): 1. To familiarize measure of central tendency. 2. To equip with various distributions. 3. To familiarize the analysis of statistical data using various distributions.	
UNIT-I (12 Lectures) Measures of Central tendency: Moments, skewness and Kurtosis- Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameter for these three distributions, Correlation and regression — Rank correlation.	
UNIT-II (12 Lectures) Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations. Test for single mean, difference of means and correlation coefficients, test for ratio of variances - Chi-square test for goodness of fit and independence of attributes.	
UNIT-III (12 Lectures) Probability spaces, conditional probability, independence; Discrete random variables, Independent random variables, the multinomial distribution, Poisson approximation to the binomial distribution infinite sequences of Bernoulli trials, sums of independent random variables; Expectation of Discrete Random Variables, Moments, Variance of a sum, Correlation coefficient, Chebyshev's Inequality.	
UNIT-IV (12 Lectures) Continuous random variables and their properties, distribution functions and densities, normal, exponential and gamma densities. Bivariate distributions and their properties, distribution of sums and quotients, conditional densities, Bayes' rule.	

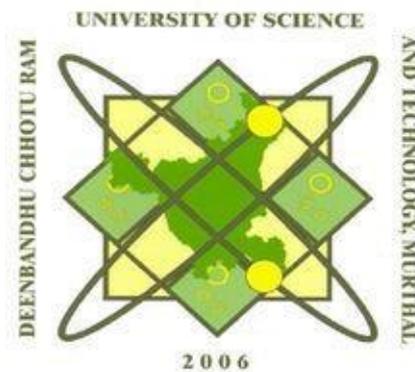
Lesson Plan for Theory Lecture
 (Below format be used by the concerned teacher for framing and implementing the lecture plan)

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY
MURTHAL (SONEPAT) HARYANA-131039
DEPARTMENT OF -----
B.Tech. _____
Semester- II
(Effective from Session 2024-25)

Course Code	Title of the Course	Course Structure	
		L-T-P	
Course Outcome:			
1.			
2.			
3.			
4.			
Unit Number	Topic to be covered	Lecture No.	
I			
II			
III			
VI			
Evaluation Scheme for Continuous Assessment			
Details of Course Co-ordinator			
Course Co-ordinator	Mobile No.	E-mail ID	

CURRICULUM
for
Universal Human Values-II (UHV-II)
(Scheme & Syllabi for First and Second semesters)
for
UNDERGRADUATE DEGREE
COURSE
IN
Bachelor of Technology
(B.Tech.)
(Common for All Branches)

[w.e.f. 2024-25]



DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE AND TECHNOLOGY
(Established Under Haryana Legislature Act No. 29 of 2006)
Murthal-131039, Sonipat (Haryana)
www.dcrust.ac.in

MC-103-D Universal Human Values-II (UHV-II)						
B.Tech. 1 st Year (Semester-I/II)						
L	T	P	Credits	Minor	:	15 Marks
3	0	0	0	TCA	:	25 Marks
				TES	:	60 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours
Unit I						
<p>Introduction to Value Education: Understanding Value Education, Self-exploration as the Process for Value Education, Sharing about Oneself, Continuous Happiness and Prosperity – the Basic Human Aspirations, Right Understanding, Relationship and Physical Facility, Exploring Human Consciousness, Happiness and Prosperity – Current Scenario, Method to Fulfill the Basic Human Aspirations, Exploring Natural Acceptance</p>						
Unit II						
<p>Harmony in the Human Being: Understanding Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body, Body as an Instrument of the Self, Understanding Harmony in the Self, Exploring Sources of Imagination in the Self, Harmony of the Self with the Body, Programme to ensure self-regulation and Health,.</p> <p>Harmony in the Family and Society: Harmony in the Family, Values in Human-to-Human Relationship, 'Trust' – the Foundational Value in Relationship, 'Respect' – as the Right Evaluation, Understanding Harmony in the Society, Vision for the Universal Human Order, Exploring system to fulfil Human Goals</p>						
Unit III						
<p>Harmony in the Nature/Existence: Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature, Exploring the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence, Exploring Co-existence in Existence</p>						
Unit IV						
<p>Implications of the Holistic Understanding: Professional Ethics, Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence, Models in Education, Holistic Technologies, Production Systems and Management Models, Strategies for Transition towards Value-based Life and Profession, Strategies for Transition towards Value-based Life and Profession, Exploring Steps of Transition towards Universal Human Order</p>						
TEXT BOOKS						
<p>1A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, GP Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1</p> <p>2. The Teacher's Manual Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, RR Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2</p>						

REFERENCEBOOKS

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantik, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth-by Mohandas Karamchand Gandhi
5. Small is Beautiful -E. F Schumacher.
6. Slow is Beautiful-Cecile Andrews
7. Economy of Permanence -JC Kumarappa
8. Bharat Mein Angreji Raj-Pandit Sunderlal
9. Rediscovering India-by Dharampal
10. Hind Swaraj or Indian Home Rule –by Mohandas K. Gandhi
11. India Wins Freedom-Maulana Abdul Kalam Azad
12. Vivekananda-Romain Rolland (English)
13. Gandhi-Romain Rolland (English)

COURSE OUT COMES: By the end of the course, students are expected:

1. To become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
2. They would have better critical ability.
3. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
4. It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

Note:

1. Examiner will set 9 questions, including one compulsory question of objective type/ short answers covering the entire syllabus. There shall be another 8 questions, two from each unit, of equal marks and students will be required to attempt one from each unit.
 2. This is a compulsory credit course. The assessment is to provide a fair state of development of the student, so participation in classroom discussions, self-assessment, peer assessment etc. will be used in evaluation.
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Engineering Chemistry

Course Code:BSCHM101D	Internal marks:Theory:25, Lab:15
	External Marks: Theory: 50, Lab:10
L-T-P:3-0-2	Maximum Marks:100
Credits-4	Duration of Exam:3hrs
About The Course: The concepts developed in this course will aid in quantification of several concepts in chemistry that have been introduced at the 10+2 levels in schools. Technology is being increasingly based on the electronic, atomic and molecular level modifications. Quantum theory is more than 100 years old and to understand phenomena at nano-metre levels, one has to base the description of all chemical processes at molecular levels.	

Course Objective:

- To acquaint the students with the basic phenomenon/concepts of chemistry, the student faces during course of their study in the industry and Engineering field.
- Explain scientifically the various chemistry related problems in the industry/engineering field.
- To introduce the new developments and break throughs efficiently in engineering and technology.
- The latest (R&D oriented) topics will make the engineering student upgraded with the new technologies.

UNIT-I

Atomic and molecular structure : Schrodinger equation. Particle in a box solutions and their applications for conjugated molecules and nanoparticles. Forms of the hydrogen atom wave functions and the plots of these functions to explore their spatial variations (derivation excluded). Molecular orbitals of diatomic molecules and plots of the multicenter orbitals. Molecular orbital energy level diagrams of diatomic. Pi-molecular orbitals of butadiene and benzene and Crystal field theory and the energy level diagrams for transition metal ions, Band structure of solids and the role of doping on band structures.

Periodic properties: Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes, ionization energies, electron affinity and electronegativity, polarizability, oxidation states. (12)

UNIT-II

Stereochemistry: Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis. Isomerism in transitional metal Compounds.

Organic reactions and synthesis of a drug molecule: Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization and ring openings (mechanism excluded). Synthesis of a commonly used drug molecule (Asprin/Paracetamol) (12)

UNIT-III

Intermolecular forces and potential energy surfaces: Ionic, dipolar and van Der Waals interactions. Equations of state of real gases and critical phenomena. Potential energy surfaces (with example).

Use of free energy in chemical equilibria: Thermodynamic functions: energy, entropy and free energy. Estimations of entropy and free energies. Free energy and EMF. Cell potentials, the Nernst equation and applications. Acid base, oxidation reduction and solubility equilibria. Water chemistry. Corrosion. Use of free energy considerations in metallurgy through Ellingham diagrams. (12)

UNIT-IV

Spectroscopic techniques and applications: Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules. Applications. Nuclear magnetic resonance and magnetic resonance imaging, surface characterisation techniques. Diffraction and scattering. (12)

- To analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.
- To rationalize bulk properties and processes using thermodynamic considerations.
- To distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques
- To rationalize periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.
- To list major chemical reactions that are used in the synthesis of molecules.

Text/Reference Books:

1. AICTE's Prescribed Textbook: Chemistry–I with Lab Manual, Manisha Agrawal, Khanna Book Publishing, 2023.
2. Engineering Chemistry, by Manisha Agrawal.
3. University chemistry, by B. H.Mahan
4. Chemistry: Principles and Applications, by M.J.Sienko and R.A.Plane
5. Fundamentals of Molecular Spectroscopy, by C.N.Banwell
6. Engineering Chemistry(NPTEL Web-book), by B.L.Tembe, Kamaluddin and M.S. Krishnan
7. Physical Chemistry, by P.W. Atkins
8. Organic Chemistry: Structure and Function by K.P.C.Volhardt and N.E.Schore,5thEdition <http://bcs.whfreeman.com/vollhardtschore5e/default.asp>

Notes:

1. The paper setter will set two question (with /without parts) from each of the four units, a ninth compulsory question comprising of 6to 10 sub parts, covering the entire syllabus. The examinee will attempt 5 question in all, along with the compulsory question (with all it subparts), selecting one question from each unit.
2. The use of programmable devices such as programmable calculators, etc is not allowed during the exam.
- 3.. A specific note shall be inserted in relevant question paper where ever the use of graph papers, semi-log papers, steam tables, etc. shall be allowed during the examination.

Laboratory/Virtual Laboratory/Field Work

Course Objective:

1. Estimate rate constants of reactions from concentration of reactants/products as a function of time.
2. Measure molecular/system properties such as surface tension, viscosity, conductance
3. of solutions, redox potentials, chloride content of water, etc
4. Synthesize a small drug molecule and analyse a salt sample

LIST OF EXPERIMENTS:

1. Determination of surface tension of given solvent by stalgmometer.
2. Removal of Ca^{2+} and Mg^{2+} hardness from given water sample using ion exchange column.
3. Calculate the R_f value of given sample using thin layer chromatography.
4. Calculate the strength of strong acid by titrating it with strong base using conductometer.
5. Calculate the EMF value of given cell.
6. Prepare the sample of urea formaldehyde and phenol formaldehyde.
7. Determination of chloride content in given water sample.
8. To study the kinetics of ethyl ester with NaOH.
9. Preparation of aspirin.
10. Calculate the saponification value of given oil sample.
11. Chemical analysis of two anion and two cation in given sample of salt.
12. Determination of the partition coefficient of a substance between two immiscible liquids.
13. Determine the alkalinity of given water sample.
14. Study the adsorption phenomena using acetic acid and charcoal.
15. Lattice structures and packing of spheres.
16. Determine the viscosity of given liquid using Ostwald viscometer.

Note: At least 10-12 experiments are to be performed by the students.

1. Each laboratory class/section shall not be more than about 20 students.
2. To allow fair opportunity of practical hands on experience to each student, each experiment may either done by each student individually or in group of not more than 3-4 students. Larger groups are strictly discouraged/disallowed.
3. Pre-experimental & post experimental quiz/questions may be offered for each lab experiment to reinforce & aid comprehension of the experiment.

Suggested Books:

1. **A Text book on Experiments and Calculation –Engineering Chemistry by S. S. Dara, S. Chand & Company Ltd.**
2. **Essential of Experimental Engineering chemistry, Shashi Chawla, Dhanpat Rai Publishing Co.**
3. **Theory & Practice Applied Chemistry – O.P. Virmani, A.K. Narula (New Age).**

LABORATORY

Choice of 10-12 experiments from the following:

1. Determination of surface tension and viscosity.
2. Thin layer chromatography.
3. Ion exchange column for removal of hardness of water.
4. Determination of chloride content of water.
5. Colligative properties using freezing point depression.
6. Determination of the rate constant of a reaction.
7. Determination of cell constant and conductance of solutions.
8. Potentiometry-determination of redox potentials and emfs.
9. Synthesis of a polymer/drug.
10. Saponification/acid value of an oil.
11. Chemical analysis of a salt.
12. Lattice structures and packing of spheres.
13. Models of potential energy surfaces.
14. Chemical oscillations-Iodine clock reaction.
15. Determination of the partition coefficient of a substance between two immiscible liquids.
16. Adsorption of acetic acid by charcoal.
17. Use of the capillary viscometers to demonstrate the isoelectric point as the pH of minimum viscosity for gelatin sols and/or coagulation of the white part of egg.

Course Outcomes:

Laboratory Outcomes:

The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering. The students will learn:

- To estimate rate constants of reactions from concentration of reactants/products as a function of time.
- To measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.
- To synthesize a small drug molecule and analyze a salt sample.

DEENBANDHUCHHOTURAMUNIVERSITYOFSCIENCE&TECHNOLOGY
MURTHAL (SONEPAT) HARYANA-131039
DEPARTMENTOFCOMPUTER SCIENCE AND ENGINEERING
II Semester Course
(EffectivefromSession2024-25)

Course Code: PCCSE102D	InternalMarks:40
Title of the Course: DISCRETE STRUCTURES	ExternalMarks:60
L-T-P: 3-1-0	Maximum Marks: 100
Credits: 4	Duration of Exam: 3 Hrs.
<p>Brief Write-Up About the Course(100-150 words) Discrete Structures is a fundamental course in Computer Science and Engineering that provides the mathematical foundation for various computing concepts. It introduces students to essential topics such as sets, relations, functions, logic, counting principles, graph theory, and algebraic structures, which are crucial for problem-solving, algorithm design, data structuring and database management. The course emphasizes logical reasoning, proof techniques, and combinatorial analysis, enabling students to develop analytical thinking skills necessary for areas like database systems, cryptography, artificial intelligence, network security, and software engineering and many more.</p>	
<p>Course Objective (CO):</p> <ol style="list-style-type: none"> Understand the fundamental concepts of sets, relations, functions, and logic, which form the basis of computing and mathematical reasoning. Learn combinatorial techniques such as permutations, combinations, recurrence relations, and generating functions, which are essential for algorithm analysis. Explore graph theory and trees, which play a vital role in network analysis, computer architecture, and database indexing. Study algebraic structures like groups, rings, fields, and Boolean algebra to understand their applications in cryptography, data security, and logic design. 	
<p>UNIT 1(Lecture-10): Mathematical Foundations and Logic</p>	
<p>Sets, Relations, and Functions: Operations on Sets (Union, Intersection, Difference, Complement), Finite and infinite Sets, Countable and uncountable Sets, Cartesian Products and Power Sets, Binary Relations, Types of Relations, Equivalence Relations, Partial Ordering Relation, Functions: Injective, Surjective, Bijective, Inverse, and Composition of Functions</p> <p>Propositional and Predicate Logic: Propositional Logic: Syntax, Semantics, Truth Tables, Logical Equivalence, Normal Forms (CNF, DNF), Predicate Logic: Quantifiers, Free and Bound Variables,</p>	
<p>UNIT-II (Lecture-10): Combinatorics and Recurrence Relations</p>	
<p>Counting Techniques:Permutations and Combinations, Pigeonhole Principle</p> <p>Generating Functions and Recurrence Relations:Recurrence Relations: Linear and Non-Linear, Solving Recurrence Relations using Iteration and Substitution, Generating Functions for Counting</p>	
<p>UNIT-III(Lecture-10): Graph Theory and Trees</p>	
<p>Graphs and Their Properties: Graphs and their properties, Degree, Types of Graphs (Directed, Undirected, Weighted, Bipartite), Graph Isomorphism and Connectivity, Eulerian and Hamiltonian Paths, Planar Graphs, Graph Coloring, Colouring maps, Colouring Vertices, Colouring Edges, List Colouring, Perfect Graph,</p>	

Trees: Binary Trees, Spanning Trees, Minimum Spanning Trees (Prim's and Kruskal's Algorithms)

UNIT-IV(Lecture-10): Algebraic Structures and Boolean Algebra

Algebraic Structures: Algebraic Structures with one Binary Operation, Semi Groups, Monoids, Groups, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic Structures with two Binary Operation, Rings, Integral Domain and Fields.

Applications in Computer Science : Introduction to the applications of Discrete Structures in Database Management Systems, Computer Networks, Compiler Design, Digital Circuit Design, AI, Cryptography.

Text Books:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw – Hill
2. C L Liu and D P Mohapatra, Elements of Discrete Mathematics A Computer Oriented Approach, 3rd Edition by, Tata McGraw – Hill.
3. Susanna S. Epp, Discrete Mathematics with Applications, 4th edition, Wadsworth Publishing Co. Inc.

Referencebooks:

1. J.P. Tremblay and R. Manohar, Discrete Mathematical Structure and It's Application to Computer Science", TMG Edition, TataMcgraw-Hill
2. Eric Gossett, Discrete Mathematics with Proof, Wiley
3. Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford University Press.
4. Schaum's Outlines Series, Seymour Lipschutz, Marc Lipson, Discrete Mathematics, Tata McGraw - Hill

Outcome(CO): Upon successful completion, students will be able to:

1. Apply logical reasoning and proof techniques to solve computational problems.
2. Utilize combinatorial methods to analyze algorithms and optimize problem-solving.
3. Develop solutions using graph theory and tree structures.
4. Understand algebraic structures and their applications.

Note:

1. The paper setter will set two questions (with/without parts) from each unit, the first question will be compulsory and comprising of 5 to 10 sub-parts, covering the entire syllabus. The examinee will attempt 5 questions in all, along with the compulsory question, selecting one question from each unit. All questions will carry equal marks.

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY
MURTHAL (SONEPAT) HARYANA-131039
DEPARTMENT OF ELECTRICAL ENGINEERING
B. Tech. in (I/II –Semester)
(Effective from Session 2024-25)

ESEE/01/D

Course Code : EE-101D	External Marks: 50 —
Title of the Course: Fundamentals of Electrical Engineering (Common for B.Tech 1 st Year)	Internal Marks : 25 — 10
L-T-P: 3-0-2	Practical Lab :25 — 10/15
Credits: 4	Maximum Marks: 100 (Including Practical)
	Duration of Exam: 03 Hrs

Brief Write-Up About the Course (100-150 words)

The Fundamentals of Electrical Engineering course offers a robust foundation in electrical principles, structured across four comprehensive units. Unit-I focuses on D.C. circuits, where students study Ohm's Law and Kirchhoff's Laws, facilitating the analysis of series, parallel, and series-parallel circuits. Key network theorems, including Thevenin's and Norton's Theorems, are also introduced. In Unit-II, the course transitions to A.C. circuits, encompassing the study of sinusoidal signals and phasor concepts. Students engage in the analysis of resistive, inductive, capacitive, and their combinations, alongside three-phase circuits and power measurement techniques. Unit-III covers transformers, highlighting their operational principles, construction, and efficiency, while also examining the functionality and types of D.C. machines. Finally, Unit-IV explores A.C. machines, focusing on induction motors and synchronous generators, and concludes with an overview of various power generation technologies, including thermal, gas, nuclear, and renewable energy sources, providing insights into their layouts and operational principles.

Course Objective (CO):

1. Introduce fundamental electrical principles and circuit theorems for analyzing D.C. and A.C. circuits.
2. Familiarize students with energy resources and their role in various power generation systems.
3. Provide fundamental knowledge of electrical machines and their practical applications.
4. Develop analytical skills for solving and interpreting D.C. and A.C. circuits and power systems

UNIT-I (Lecture- 10)

D.C. Circuits: Ohm's Law and Kirchhoff's Laws; Analysis of Series, Parallel and Series-Parallel circuits excited by independent voltage sources, Mesh current method, Nodal method of analysis, Superposition Theorem, Thevenin's Theorem, Norton and Maximum Power Transfer Theorem; Star-Delta Transformation.

UNIT-II (Lecture-10)

AC Circuits: Sinusoidal signal, Instantaneous & Peak Values, Average & RMS Values, Form factor and Peak factor of Sinusoidal Voltage and Current, Concept of Phasors: Rectangular & Polar, Trigonometric & Exponential forms; Analysis of RLC series and RLC Parallel Circuits; Real power, Reactive Power, Apparent Power and Power Factor.

Three Phase A.C. Circuits: Introduction to 3-Phase circuit, Relationship between Line and Phase values of 3-phase balanced Star and Delta Connections, Measurement of three-phase power by two wattmeter method in Three Phase balanced Circuits,

UNIT-III (Lecture-8)

Transformer: Principle of Operation and Construction of Single Phase and three phase Transformers (Core and Shell Types), EMF Equation. Losses, Efficiency & Voltage Regulation (Introductory theoretical concept Only);

D.C Machines: Working Principle and Constructional features of DC Machine as a Generator and a Motor; EMF Equation, Types of D.C. Motors and their applications.

Handwritten signatures and marks

UNIT-IV (Lecture-10)

AC Machines: Concept of working principle and operation of 1-phase and three phase Induction Motors, and their types (i.e 1-phase capacitor start, resistance start, 3-phase Squirrel Cage and Slip Ring Motors) ; Principle and working operation of Synchronous Generators and its Types and Constructional features.

Power Plants: Introduction to Thermal-Steam, Diesel, Gas, Nuclear Power Plants, Wind, Solar, Fuel Cell, Tidal, Geo-thermal, Hydroelectric Power Plants (Block diagram and working only).

Text Books:

1. E. Hughes, "Electrical and Electronics Technology", Pearson Education.
2. Del Toro, "Electrical Engineering Fundamentals", Pearson Education.
3. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill.
4. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill.

Reference books:

1. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press.
2. B.L Theraja, A Text Book of Electrical Technology, S. Chand & Co.
3. S.K. Sahdev, "Basic Electrical Engineering" Pearson Education

Course Outcome (CO):

1. Analyze D.C. and A.C. circuits using fundamental electrical principles and circuit theorems.
2. Understand the significance of various energy resources in power generation.
3. Identify practical applications of different electrical machinery.
4. To understand basic electric circuit and power apparatus.

Note:

1. The paper setter will set two questions (with/without parts) from each units, the first question will be compulsory and comprising of 5 to 10 sub-parts, covering the entire syllabus. The examinee will attempt 5 questions in all, along with the compulsory question, selecting one question from each unit. All questions will carry equal marks.

Title of the Course: Fundamentals of Electrical Engineering Lab

Internal Marks: 15

External Marks: 10

Laboratory/Virtual Laboratory/Fieldwork

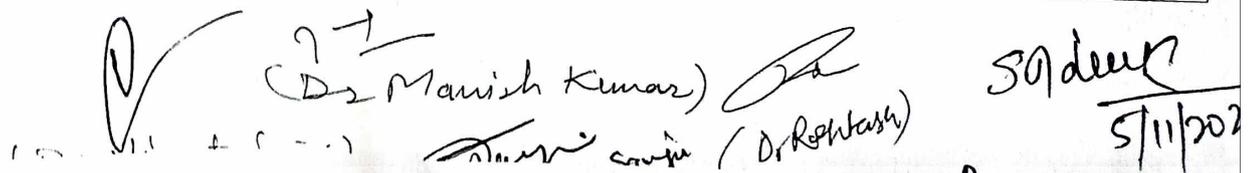
Note:

- a. At least 10 experiments are to be performed by students in the semester.
- b. At least 8 experiments should be performed from the below list; the remaining two experiments may either be performed from the below list or designed and set by the Dept. as per the scope of the syllabus.

List of Experiments

1. To study various types of Electrical meters used in an Electrical Laboratory.
2. To verify KCL, KVL.
3. To verify Superposition theorem.
4. To verify Thevenin's Theorem.
5. To verify Maximum Power Transfer Theorem in DC circuit.
6. To Analyze Series RLC Circuit, and draw its phasor diagram.
7. To make a simple circuit of house wiring containing one florescent tube light, one fan and one socket.
8. To measure Power and Power Factor in Three Phase Circuit using two Wattmeter method.
9. To perform Polarity and Turn Ratio Tests on Single Phase Transformer.
10. To study of Earthing in an Electrical System.
11. Make a circuit to understand the working of 1-Phase supply, Battery and UPS connection with load.

Self-Study based on Indian Knowledge System

 (Dr. Manish Kumar) (Dr. Roshni) 5/11/2022

CO-PO/PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	70%				50%		60%					60%				
CO2					50%		60%					60%				
CO3					50%		60%					60%				
CO4					50%		60%					60%				
Average	17.5%				50%		60%					60%				

[Signature]

(Dr. Manish Kumar)

[Signature]

(Dr. Vincent Saini)

S. Paley
5/11/2024

(Dr. Susender Dahiya)
Chairman DGBOR

[Signature]

(Dr. Rehtash)

[Signature]
(Dr. Sanju Saini)