



SCHOOL OF BASIC SCIENCES



Curriculum and Syllabus

For

B.Tech I Semester

Circuit Branches (CSE, IT, ECE, EEE, EIE)

Academic Year (2014-2015)

SEMESTER I

SUB.CODE	SUBJECT	L	T	P	C
THEORY					
U1GEB20	Engineering English – I	2	0	0	2
U1GEB21	Engineering Mathematics – I	3	1	0	4
U1GEB22	Engineering Physics – I	2	0	0	2
U1GEB23	Engineering Chemistry – I	2	0	0	2
U1GEB24	Principles Of Electrical and Electronics Engineering	3	0	0	3
U1GEB25	Basics Of Computers and C Programming	3	0	0	3
PRACTICAL					
U1GEB26	Engineering Physics and Chemistry Laboratory-I	0	0	4	2
U1GEB27	Principles Of Electrical & Electronics Engineering Laboratory	0	0	3	2
U1GEB28	Computer Practices Laboratory	0	0	3	2
TOTAL CREDITS					22

L – Lecture; T – Tutorial; P – Practical; C – Credit

Course Code: U1GEB20
Course Name: Engineering English I
Designed For: First year semester I (Common to all Branches)

L	T	P	C
2	0	0	2

1. PREAMBLE:

This course expands students' practical vocabulary, ability to communicate effectively in oral English in a variety of situations with the help of pronunciation, intonation, grammar and sentence structure and also trained them to participate in group discussion, presentation, discussion of current events and problems-offering suggestions/ solutions/ opinions.

2. COURSE EDUCATIONAL OBJECTIVES:

Students undergoing this course are expected:

- To develop their basic communication skills in English
- To achieve specific linguistic and communicative competence
- To acquire relevant skills and function efficiently in a realistic working context
- To inculcate the habit of reading for pleasure

3. COURSE OUTCOMES

On successful completion of this course, students will be able to:

- Respond orally to the written works, grounding their ideas in the text.
- Formulate open-ended questions in order to explore a topic of interest
- Training to adhere in analytical and critical dialogue orally
- Engage in daily, meaningful reading tasks in English class and/or at home.
- Develop interpersonal skills on current problems and events

4. PRE-REQUISITES

Admission to B.Tech.Programme

5. LINK TO OTHER COURSES

Fundamental to B.Tech.courses.

6. COURSE CONTENT

UNIT I TECHNICAL GRAMMAR

9

Parts of Speech, Time, Tense and Aspect, Active and Passive Voice, WH Questions, Question Tag-Concord

UNIT II INFORMATION SKILLS

9

Letter writing, Formal and Informal letters, Transformation of information and Transcoding (Pie chart, bar chart & classification table), Process Description, Note taking, Note Making, Paragraph Writing

UNIT III LANGUAGE OUTLINE

9

Definitions and Extended Definitions, Hints Development, Checklist, Dialogue Writing, Report, its importance and Report Writing

UNIT IV LANGUAGE SKILLS

9

Process of Communication and factors, Verbal and Non-verbal Communication, Listening Skills, Reading Skills, Speaking skills, Writing skills

UNIT V INTUITION SKILLS

9

Creative thinking, Critical thinking, Discussion of current affairs and events and problems, Offering suggestions/ solutions/ sharing opinions

7. LEARNING RESOURCES

7.1. Text Book

1. Andera, J.Rutherford. Basic Communication Skills for Technology, Second edition, Pearson Education,2007
2. Butterfield, Jeff. Soft Skills for Everyone, Cengage learning, Canada,2011

7.2.Reference Books

1. Bailey, Stephen. Academic Writing: A Practical Guide for Students. New York: Rutledge, 2011.
2. Morgan, David and Nicholas Regan. Take-Off: Technical English for Engineering. Garnet Publishing Limited. New York: Longman, 2008.
3. Ganesan. S, Persis Mary T &Subhashini.B. Communication in English, Himalaya Publishing House, Mumbai, 2009.
4. Pickett, Nell Ann, Ann A.Laster and Katherine E.Staples. Technical English: Writing, Reading and Speaking. New York: Longman, 2009.

7.3.Online Resources

1. <http://www.lonestar.edu/useful-websites-for-students.htm>
2. www.english-for-students.com/
3. www.britishcouncil.org
4. www.sfsu.edu/~puboff/onestop.htm
5. www.uefap.com
6. www.eslcafe.com
7. www.listen-to-english.com
8. www.owl.english.purdue.edu

Course Code: U1GEB21
Course Name: ENGINEERING MATHEMATICS-I
Common to all Branches

L	T	P	C
3	1	0	4

1. PREAMBLE: .

This course provides an introduction to the basic concepts and techniques of multivariable calculus and sequence and series, matrices, emphasizing their inter-relations and applications to engineering, and science areas; introduce students to cognitive learning in mathematics; and develops problem solving skills with both theoretical and engineering oriented problems.

2. PRE-REQUISITES:

Admission to B.Tech. Programme

3. LINKS TO OTHER COURSES

Fundamental to B.Tech. courses.

4. COURSE EDUCATIONAL OBJECTIVES

- To develop the basic mathematical knowledge and computational skills of the students in the areas of applied mathematics.
- To develop the skills of the students in the areas of several variable Calculus, Matrices, and sequences and series.
- To serve as a pre-requisite mathematics course for post graduate courses, specialized studies and research.

5. COURSE OUTCOMES

On successful completion of this course students will be able to:

- Calculate eigen-values and eigen-vectors, apply Caley-Hamilton theorem, and diagonalize of symmetric matrices and demonstrate the nature of quadratic forms.
- Discuss the convergence and divergence of sequence and series of real numbers using various tests.
- Demonstrate understanding of the derivatives of functions of several variables, viz., partial and total differentiation, and differentiation of implicit functions and optimize the functions of several variables using Hessian method and Lagrangian method.
- Evaluate double integration and triple integration using Cartesian, polar co-ordinates and the concept of Jacobian of transformation from one coordinate system to another coordinate system.

- Identify the improperness in integrals and evaluate the integrals using appropriate mathematical tools and how to apply beta and gamma integrals keeping improperness in mind.

6. COURSE CONTENT

UNIT I MATRICES

L- 9 + T-3

Characteristic equation – Eigen-values and Eigen-vectors of a real matrix – Statement of Cayley-Hamilton theorem – Applications of Cayley-Hamilton theorem in finding the inverse of a non-singular matrix and the power of a square matrix – Diagonalization of symmetric matrices – Nature of Quadratic forms

UNIT II SEQUENCES AND SERIES

L- 9 + T-3

Sequences – Convergence of series – Series of positive terms – Tests for convergence (n-th term, ratio, comparison, root and integral tests) and divergence - Leibnitz test for alternating series –Series of positive and negative terms - Absolute and conditional convergence– Power series – Taylor and Maclaurin series

UNIT III DIFFERENTIAL CALCULUS OF SEVERAL VARIABLES L- 9 + T-3

Limits and continuity- Partial Derivatives – Total derivative – Differentiation of implicit functions – inverse functions – Jacobian – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers

UNIT IV INTEGRAL CALCULUS OF SEVERAL VARIABLES L- 9 + T-3

Double integrals- Change of order of integration – Double integrals in polar coordinates – Triple integrals – Area as a double integral – Volume as a triple integral

UNIT V IMPROPER INTEGRALS

L- 9 + T-3

Meaning of improper integrals - Beta and Gamma functions – properties –Reduction formula for $\Gamma(n)$ – Relation between gamma and beta functions - Evaluation of integrals using Beta and gamma functions – simple problems

BEYOND THE SYLLABUS

Vector spaces-linear dependence-linearly independent vectors-Dimension of a vector space-Inner product of vector space-orthogonal vectors-Norm of a vector-Gram-Schmidt orthogonalization process

7. LEARNING RESOURCES:

7.1 Required Resources:

Bridge Course notes. (10 Lectures)

Hyghes-Hallett, Gleason, McCallum et al.(15 authors) *Single Variable Calculus* (6th Edn) John Wiley and Sons New York, 2013

TEXT BOOKS

1. Grewal B.S., *Higher Engineering Mathematics*, Khanna Publishers, New Delhi, 41st Edition, 2011.
2. Jain R.K and Iyengar, S.R.K *Advanced Engineering Mathematics*, 3rd edition, Narosa Publishing House, 2009.

7.2 Recommended Resources

1. Adrian Banner. *The Calculus Lifesaver*, Princeton University Press, Princeton, USA, 2007.
2. Alan Jeffrey. *Advanced Engineering Mathematics*, Harcourt/Academic Press, New York, 2002.
3. Hyghes-Hallett, Gleason, McCallum et al. *Single Variable Calculus* (6th Edn) John Wiley and Sons New York, 2013.
4. Hyghes-Hallett, Gleason, McCallum et al. *Multivariable Variable Calculus* (6th Edn) John Wiley and Sons New York, 2013.
5. Dennis G. Zill , Warren S. Wright and Michael R.Cullen. *Advanced Engineering Mathematics* (4th Edn) Jones a& Bartlett Learning, Canada, 2011.
6. James Stewart. *Multivariate Calculus, Concepts and Contexts.* (3rd Edn) Thomson/Brooks/Cole, Canada, 2005.
7. John Bird. *Higher Engineering Mathematics*, (5th Edn) Elsevier , Burlington,USA, 2006.
8. K.A.Stroud and D.J.Booth. *Advanced Engineering Mathematics* (4th Edn) Palgrave/MacMillan, USA. 2003.
9. Soo T. Tan. *Single Variable Calculus*, Brooks/Cole, Cengage Learning, Belmont, USA, 2010.
10. Soo T. Tan. *Multivariable Calculus*, Brooks/Cole, Cengage Learning, Belmont, USA, 2010.
11. Duraipandian P, Udayabaskaran S and Karthikeyan T, *Engineering Mathematics* (I Year) Muhil Publishers, 2010.
12. Kreyszig, E. *Advanced Engineering Mathematics*, (9th Edn.), John Wiley and sons, New York 2005.
13. Peter O' Neil, *Advanced Engineering Mathematics*, Cengage Learning, Boston, USA, 2012.

7.3 Web Resources

This course uses exclusively for providing electronic resource, such as lecturer notes, assignment papers, and sample solutions. Students should make appropriate use of this recourse.

http://en.wikipedia.org/wiki/Eigenvalues_and_eigenvectors

<http://www.math.hmc.edu/calculus/tutorials/eigenstuff/>

https://www.khanacademy.org/math/linear-algebra/alternate_bases/eigen_everything/v/linear-algebra--introduction-to-eigenvalues-and-eigenvectors

<http://ceee.rice.edu/Books/LA/eigen/>
<http://www.mathresource.iitb.ac.in/linear%20algebra/mainchapter10.3.html>
www.nptel.in

Mathematics Websites: The following information on the Mathematics Web sites will be an additional source of information for references and historical development of the Mathematics. Some biographies of outstanding mathematicians are also available. This is the common information for both teachers and students of Mathematics.

1. <http://scienceworld.wolfram.com/biography/topics/Mathematicians.html>
2. <http://teachers.sduhsd.k12.ca.us/abrown/index2.html>
3. <http://www.maths.tcd.ie/pub/HistMath/People/RBallHist.html>
Mathematicians of the 17th and 18th Centuries
4. <http://www.geometry.net/math.html>
A Geometry Site
5. http://www-history.mcs.st-andrews.ac.uk/history/Indexes/Full_Alph.html
Site of Biographies of Mathematicians
6. <http://mathforum.org>
This site includes resources in mathematics for school students, teachers, parents. Also contains some research related material on mathematics teaching and learning. The 'Problems of the Week' contains problems at different levels of mathematics. It includes selected alternative solutions posted by problem solvers which is really nice. The 'Ask Dr. Math' gives useful explanations of math concepts and the discussion groups are about teaching methods.
7. <http://www.cut-the-knot.org>
Contains interesting puzzles, problems, theorems, proofs, etc. Also has links to other good sites (including all those listed below).
8. <http://nrich.maths.org>
The site is run by the University of Cambridge. It contains problems for different age groups (5 to 18) that one can post solutions to. Selected solutions are published at the website. One can also post questions. There is an archive of questions posted earlier with answers (in blue coloured font). There are also articles, features, etc.
9. <http://archives.math.utk.edu/>
A fairly comprehensive archive: contains teaching materials, public domain software, shareware, books, articles, etc.
10. <http://www-groups.dcs.st-and.ac.uk/~history/>
The MacTutor history of mathematics archive. The best known website for historical information about mathematicians and mathematics.
11. <http://www.maa.org/>
This is the website of the Mathematical Association of America. Contains useful resources for college mathematics teachers including book reviews.
12. <http://e-math.ams.org/> Website of the main professional organization in mathematics: American Mathematical Society. The journal 'Notices of the AMS' is online. Plus Interesting essays.

Course Code: U1GEB22

Course Name: ENGINEERING PHYSICS – I

Designed for: Year: I Semester: I

L	T	P	C
2	0	0	2

1. PREAMBLE

This course U1GEB22; Engineering Physics-I, explores various fundamental aspects of Physics.

2. COURSE EDUCATIONAL OBJECTIVES

- To understand the basic laws of physics and their applications in engineering and technology.
- To develop scientific temper and analytical capability.
- To solve various engineering problems.

3. COURSE OUTCOMES

On successful completion of this course students will be able to:

1. Discuss the basic physics concepts and its applications in a day to day life; demonstrate the knowledge in ultrasonic applications and its importance.
2. Identify information to relate and apply the utilizations of the electron beams in modern technologies such as CRT, CRO etc.
3. Explain the basic understandings of the matter, crystal structure and its fundamental properties including crystal systems, Miller indices, and X-Ray production.
4. Demonstrate the conductivity nature of metals and the classification of the solids learned from The Band Theory of Solids.
5. Identify the importance of the widely used current technologies such as mobile phones, solar cells for which semiconductor technology is essential.

4. PRE-REQUISITE:

Admission to B.Tech. Programme

5. LINKS TO OTHER COURSES

Fundamental to B.Tech. courses.

6. COURSE OUTLINE

UNIT-I: Acoustics

8L + 1T

9

Introduction, sound waves - Pitch and Intensity. Reflection of sound waves, Sabine formula, absorption of sound, reverberation Theory. Ultrasonic's –Acoustic Grating – production - magnetostriction oscillator and piezoelectric oscillator, Properties and applications

UNIT -II: Electron Optics**8L + 1T****9**

Introduction, Electron-refraction-Bethe's law, Electron Gun and Electron Lens, Cathode Ray Tube and Cathode Ray Oscilloscope, Cyclotron, Bainbridge Mass Spectrograph, Electron Microscope, Applications.

UNIT -III: Crystal structures and X-Rays**8L + 1T****9**

Introduction, Space lattice, unit cell, lattice parameters, Bravais Lattice - Crystal systems. Characteristics of Unit cell. Miller indices of planes. X-Rays –production, Bragg's Law. Powder crystal method and rotating crystal method.

UNIT -IV: Band Theory of Solids**8L+ 1T****9**

Introduction, Electrical conduction, conductivity, drift velocity, influence of external factors on conductivity. The Band Theory of solids, Energy Bands, Energy Gap. Classification of solids, Energy Band structure of a conductor. Fermi-Dirac distribution function and Fermi Energy. Energy Band structure of an Insulator and semiconductor.

UNIT -V: Semiconductors**8L+ 1T****9**

Introduction, Types- Intrinsic and Extrinsic semiconductors. Intrinsic carriers-electron and hole concentrations. Fermi level in intrinsic carrier density, Conductivity, Doping of impurities-N-type and P-Type. Temperature variation-law of mass action-Charge neutrality condition- Fermi level in extrinsic semiconductor-Hall effect-Applications.

Beyond the syllabus

Acoustics of buildings. Sonography, Cathode Ray Tube, Magnetic bottle, Modes of laser beam, Classification of hologram, Bragg's X-Ray spectrometer, Semiconductors in Electronics.

7. LEARNING RESOURCES**7.1 Text Books**

1. M.N. Avadhanulu and P.G. Kshirsagar ,A Text Book of Engineering Physics, S.CHAND and Co, 2012.
2. Gaur and Gupta, Engineering Physics , DhanpatRai publications, 2009

7.2 References Books

1. S.O.Pillai ,Solid State Physics,New age international publications, 2010.
2. M.Arumugam, Engineering Physics,Anuradha publications, 2009.
3. Charles Kittel ,Introduction to Solid State Physics ,Wiley India publications, 2009.
4. Introduction to Solids –L.Azaroff TMH,33rd Reprint 2009.
5. Materials Science and Engineering – William Calister – Wiley India- Sixth Edition 2009.

7.3 Web Resources

1. <http://deploy.virtual-labs.ac.in/labs/phy14/>
2. <http://ocw.mit.edu/courses/physics>
3. <https://www.khanacademy.org/science/physics>
4. www.skilledup.com
5. www.nsf.gov/news/classroom/physics.jsp
6. <http://www.crscience.org/e>

Course Code: U1GEB23

Name of the Course : ENGINEERING CHEMISTRY-I

L	T	P	C
2	0	0	2

Designed for: Year :1 Sem :1st

1. PREAMBLE

This course U1GEC04; Engineering Chemistry-I, imparts a sound knowledge on the principles of chemistry involving different application oriented topics required for all branches of engineering.

2. COURSE EDUCATIONAL OBJECTIVES

Students undergoing this course are expected to be conversant with:

1. A sound knowledge on the principles of chemistry and its applications in industries as well as research oriented topics useful for project submission of all branches of engineering.
2. Various aspects and principles of water treatment, surface chemistry, fuels and combustion along with preparation and application of important engineering materials and polymers.
3. Development of scientific approach towards solving time bound theoretical and experimental problems and ability to work in a team both as members and leaders.

3. COURSE OUTCOMES

After completing first semester, students from all branches of engineering will:

- Demonstrate knowledge on the design of boilers, conditioning methods and the various treatments of water for public use.
- Demonstrate knowledge concerned with the various industrial applications of adsorption techniques.
- Describe various aspects related to Engineering polymers and their application in industries, chemical compositions and uses.
- Describe Engineering materials and their significance in the present day life.
- Demonstrate knowledge on fuels, their manufacturing and analysis.

4. PRE-REQUISITE:

Admission to B.Tech. Programme

5. LINKS TO OTHER COURSES

Fundamental to B.Tech. Courses.

6. COURSE CONTENT

UNIT- I WATER TREATMENT AND TECHNOLOGY **9**

Introduction- Hardness-Types and estimation by EDTA method-Boiler feed water – requirements- disadvantages of using hard water in boilers- internal conditioning (phosphate, calgon and carbonate conditioning methods)-external conditioning method-demineralization process – desalination-reverse osmosis –Electrodialysis- Domestic water treatment.

UNIT–II SURFACE CHEMISTRY **9**

Introduction-types of adsorption-adsorption of gases on solids, solute from solution-adsorption isotherm- Freundlich and Langmuir adsorption isotherm- BET basics and industrial applications. Role of adsorbent in catalysis- ion exchange reaction- chromatography – role of activated carbon in pollution abatement of air and waste water- Industrial applications of adsorption

UNIT–III POLYMERS **9**

Polymer, Classification based on, origin, structure, chemical structure, Degree of polymerization - Types of polymerization – Thermosetting and Thermoplastic polymers and their applications- Molecular weight of the polymer-Number average, weight average by viscosity method.Glass transition temperature-Conducting polymer and Biopolymers-Polymeric composites.

UNIT–IV MATERIALS CHEMISTRY **9**

Abrasives-Classification and properties, Refractories-Classification and properties, Lubricants-Classification and properties. Organic electronic materials-liquid crystals, non-linear optics and LED, Nano materials-Buckminster fullerenes, CNT'S(Single walled carbon nano tubes and Multi-walled carbon tubes), advantages and applications-Nano composites

UNIT–V FUEL AND COMBUSTION CHEMISTRY **9**

Classification, Characteristics of fuel, Comparison between Solid, liquid and gaseous fuels, Combustion processes-Bomb calorimeter -Calorific value: gross and net calorific values.Solid Fuels: Coal: Classification, Analysis: Proximate and Ultimate analysis of coal and their importance, Metallurgical coke: Properties, Manufacture by Otto Hoffman process. Synthetic Petrol: Fischer-Tropsch process and Bergius Process, Knocking and chemical structure, octane number and cetane number and their significance, Gaseous Fuels: Natural gas, artificial gas (water gas, producer gas, coal gas). Flue gas analysis – Orsat apparatus

• TOPICS BEYOND THE SYLLABUS

1. Fuels used in rockets
2. Hydrogen as emerging alternate fuel
3. Application of polymeric composites in aerospace and automobile industry

7. LEARNING RESOURCES

7.1 TEXT BOOKS

1. P.C.Jain and Monica Jain - “Engineering Chemistry” DhanpatRai Pub, Co., New Delhi

- (2002).
2. S.S.Dara- “A Text book of Engineering Chemistry” S.Chand&Co.Ltd., New Delhi (2006).
 3. A. Ravikrishnan– Engineering Chemistry, Sri Krishna Publication, Chennai.

7.2 REFERENCES

1. B.K.Sharma - “Engineering Chemistry”, Krishna Prakasan Media (P) Ltd., Meerut (2001)
2. B.Sivasankar - “Engineering Chemistry” Tata McGraw-Hill Pub.Co.Ltd. New Delhi (2008).
3. B.R.Puri, L.R. Sharma, S.Pathania - “Principles of physical Chemistry” (2000).

7.3 Web Resources

- 1) <http://en.wikipedia.org/wiki/Electrochemistry>
- 2) [http://en.wikipedia.org/wiki/Water Treatment](http://en.wikipedia.org/wiki/Water_Treatment)
- 3) <http://en.wikipedia.org/wiki/Spectroscopy>

Course Code: U1GEB24

Name of the Course :PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING

Designed for: Year :1 Sem :1st

L	T	P	C
3	0	0	3

1. PREAMBLE

This course , provides an introduction to understand the concepts and working principles of circuit elements and laws underlying DC,AC magnetic circuits & various common electrical machines for the budding engineers, . Moreover it emphasizes On the concept and working of commonly used electronic devices ,digital circuits and communication topologies to work them in the cutting-edge technology in the field of respective specializations & acquire the basic skills of approaching and dealing with real life situations and solving operating problems.

2. COURSE EDUCATIONAL OBJECTIVES

- To make students understand about the basic laws, concepts and allied terminologies pertaining to D.C Circuits & magnetic circuits
- To impart knowledge to students regarding the fundamentals of alternating current Rules and associated terminologies and it's behavior with fundamental elements like resistance inductance and capacitance.
- To make student familiarize about the various basic ac & dc rotating machines and transformers.
- To make students familiarize about the basic knowledge in state solid electronic devices and digital logic gates.
- To make students aware about fundamental principles underlying the working of various communication systems, modulation procedure and spectral bands.

3. COURSE OUTCOMES

On successful completion of this course students will be able to:

- Enumerate the basics of electric circuit elements, related terminologies and fundamental laws governing the operation and analysis of those circuits with DC sources and laws, and also concepts related to magnetic circuits.
- Develop knowledge about the concept of single phase alternating current, its generation and circuit behavior with basic elements like resistance, inductance, & capacitance.
- Cite the operating principles and identify various ac, dc machines and transformers.
- Illustrate common solid state devices & access their characteristic and explain the basic of logic gates.
- Correlate & summarize the fundamentals concepts behind electronic communication systems

4. PRE-REQUISITE

Basic intermediate second year physics.

5. Links to Other courses

- Circuit branches related courses
- Allied courses of non circuit branches based on electrical and electronic concepts.

6. COURSE CONTENT

UNIT I - D.C.CIRCUITS & MAGNETIC CIRCUITS

9

Electrical quantities, Ohm's Law, Series and parallel combinations, Kirchhoff's laws, Node and Mesh Analysis - Star - Delta Transformation - Definition of MMF, Flux and reluctance - Leakage factor - Reluctances in series and parallel (series and parallel magnetic circuits) - Electromagnetic induction - Fleming's rule - Lenz's law - Faraday's laws

UNIT II - A.C.CIRCUITS

9

. Sinusoidal functions - RMS (effective) and Average values - Phasor representation - J operator – sinusoidal excitation applied to purely resistive, inductive and capacitive circuits - RL, RC and RLC circuits- Introduction to three phase circuits.

UNIT III –ELECTRICAL MACHINES

9

Definition of Electrical Machines-Principle and Operation Of Generator and Motor, types of DC and AC Machines ,EMF equation of DC machines, Principle of Transformer, EMF equation of transformer-Principle of Induction Motor, Synchronous Motor

UNIT IV - BASIC ANALOG AND DIGITAL ELECTRONICS

9

PN junction Diode - Rectifiers - Half wave and full wave rectifiers, Bipolar Junction Transistor - Characteristic of FET, MOSFET, Silicon Controlled Rectifiers and Triac - Basic Logic Gates- Universal Logic Gates

UNIT V - BASIC COMMUNICATION SYSTEMS

9

Basic Communication systems- Advantages of digital system- Elements of communication system - Electromagnetic spectrum - Modulation concepts

BEYOND THE SYLLABUS

- Construction and operation of IGBT
- GSM and CDMA Technology
- Basic operation of machines
- Introduction to network theory

TEXT BOOKS

1. Mittle.B.N, AravindMittle, "Basic Electrical Engineering", Tata McGraw Hill", 2nd Edition. Sep 2005.
2. Theraja.B.L, "Fundamentals of Electrical Engineering and Electronics", S.Chand& Co., 1st Multicolor Edition, 2006 (Reprint 2009).
3. Sedha.R.S, A Text book of Applied electronics, 2nd Edition, S.Chand& company, 2005.
4. Bhattacharya.S.K and Renuvig, Principles of electronics, 3rd Edition, S.K.Kataria& Sons, 2002.

REFERENCE BOOKS

1. Smarajit Ghosh, "Fundamentals of Electrical and Electronics Engineering", PHI Learning Private Ltd, 2nd Edition, 2010.
2. Wadhwa.C.L, "Basic Electrical Engineering", New Age International, 4th Edition, 2007. (Reprint June 2010)
3. AbhijitChakrabarti, SudiptaNath&Chandan Kumar Chanda, "Basic Electrical Engineering", Tata McGraw Hill, 1st Edition, 2009.
4. T. Thyagarajan, —Fundamentals of Electrical Engineering, SciTech Publications, 5th Edition, Reprint Jan 2010.

Course Code: U1GEB25

Course Name: BASICS OF COMPUTERS AND C PROGRAMMING

L	T	P	C
3	0	0	3

Designed for: Year: I Semester: I

1. COURSE EDUCATIONAL OBJECTIVES:

Students undergoing this course are expected to:

- L e a r n the fundamentals of computer and information Technology techniques
- L e a r n the basics of C programming

2. COURSE OUTCOMES:

Students undergoing this course are able to

- Use computers at user level, including operative systems, programming environments and differentiate between basic concepts of computer hardware and software.
- Analyze problems, design and implementing algorithmic solutions.
- use data representation for the fundamental data types, read, understand and trace the execution of programs written in C language.
- write the C code using a modular approach and recursive concepts.
- Explain the dynamics of memory by the use of pointers and create/update basic data files.

3. PRE-REQUISITE

Basic mathematics.

4. Links to Other courses

- Circuit branches related courses
- Allied courses of non circuit branches based on electrical and electronic concepts .

3. CONTENTS

UNIT I BASICS OF COMPUTER AND INFORMATION TECHNOLOGY 9

Digital Computer Fundamentals–Block diagram of a computer–Components of a computer system–Applications of Computers–Hardware and Software definitions– Categories of

Software–Booting–Installing and uninstalling Software–Software piracy–Software terminologies–Information Technology Basics–History of Internet–Internet Tools.

UNIT II PROBLEM SOLVING METHODOLOGY 9

Problem solving Techniques–Program–Program development cycle–Algorithm – Flow chart – Pseudo Code – Program control structures – Types and generation of programming languages – Development of algorithms for simple problems.

UNIT III INTRODUCTION TO C 9

Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operations – Decision Making - Branching and Looping.

UNIT-IV FUNCTIONS 9

Arrays- Character arrays and Strings - Defined Functions - Definition of Function–Declaration - Category of Functions - Nesting of Functions, Recursive function, Structures and Unions, Enumeration and Typedef.

UNIT V POINTERS, FILE MANAGEMENT AND OPERATING SYSTEM CONCEPTS 9

Pointers – File Management in C – Input / Output Operations on Files -The Preprocessor, Introduction to UNIX and LINUX programming.

BEYOND THE SYLLABUS

Analysis of algorithms, Demonstration of Test Data on programs.

7. Learning Resources

7.1 TEXT BOOKS

1. Reema Thareja, – Fundamentals of Computing & C Programming|| Oxford University Press, 2012.
2. E.Balagurusamy, –Programming in ANSI C||, Fifth Edition, Tata McGraw- Hill, 2011.
3. Ashok.N.Kamthane,– Computer Programming||, Fifth Edition Pearson Education, 2008.
4. Richard Petersen, –Linux: The Complete Reference||, Sixth Edition, Tata McGraw-Hill,2007
5. ITL Education Solutions Limited, ‘_Introduction to Information Technology’, Pearson Education (India), 2005.

7.2 REFERENCES

1. P.Visu, R.Srinivasan and S.Koteeswaran, –Fundamentals of Computing and Programming||, Fourth Edition, Sri Krishna Publications, 2012.

2. E.Balagurusamy, -Computing Fundamentals and C Programming||, Tata McGraw-Hill,2008.
3. Pradip Dey, Manas Ghoush, -Programming in C||, Oxford University Press, 2007.
4. Byron Gottfried, -Programming with C||, 2 Edition, TMH Publications, 2008.
5. Stephen G.Kochan, -Programming in C||, Third Edition, Pearson Education India, 2005.
6. http://www.tutorialspoint.com/computer_fundamentals/
7. <http://www.indiabix.com/computer-science/computer-fundamentals/>
8. http://www.placementquestion.com/category/computer_fundamentals/http://www.proprof.com/quiz-school/story.php?title=fundamentals-computer-part-1

Course Code: U1GEB26

Course Name: ENGINEERING PHYSICS AND CHEMISTRY LAB – I

Designed for: Year: I Semester: I

L	T	P	C
2	0	0	2

ENGINEERING PHYSICS LAB – I

1. PREAMBLE

The course provides knowledge for conducting experiments to measure properties like moment of inertia, focal length, wave length, velocity and Young's modulus.

2. COURSE EDUCATIONAL OBJECTIVES

- To impart skills in measurements and hand on operation
- To design and plan the experimental procedure and to record and process the results.
- To reach non trivial conclusions of significant of the experiments.

3. COURSE OUTCOMES

After the completion of the experiments in Physics lab, students will be able to

1. Relate and apply the moment of inertia of the disc.
2. Translate sensory input into physical tasks
3. Recognize standards to perform a skill or task correctly
4. Use standards to evaluate their own performance and make corrections.
5. Evaluate information based upon standards and criteria values.

4. PRE-REQUISITE:

Admission to B.Tech. Programme

5. LINKS TO OTHER COURSES

Fundamental to B.Tech. courses.

6. Course Content:

1. Torsional Pendulum

To determine the moment of inertia of the disc and the rigidity modulus of the wire by Torsional oscillations.

2. Newtons' Rings

To find the focal length of a lens by forming Newton's ring.

3. Laser Grating

(i) Determination of wavelength of Laser using Grating and Particle size determination

(ii) Determination of Numerical Aperture and Acceptance angle of an Optical Fibre

4. Ultrasonic Interferometer

Determination of Velocity of ultrasonic waves in a liquid and compressibility of the liquid.

5. Young's Modulus – Non-Uniform Bending

To determine Young's modulus of the material of the beam by Non uniform bending method.

U1GEB26 ENGINEERING CHEMISTRY LAB -1

L	T	P	C
0	0	2	1

1.Preamble : This course provides basic concept for water quality analysis.

2.Course Educational Objectives:

Students undergoing this course are expected to be conversant with basic titration set up and methodologies for determining strength, hardness and alkalinity of various unknown solutions and water samples.

3.Course Outcomes:

After completing first semester, students from all branches of engineering will possess:

1. Gain acquaintance in the determination the amount of hardness and chloride in the various samples of water for general purpose and their use it industries involving boilers.
2. Skills in estimating acidity/alkalinity in given water samples.
3. Expertise in estimating dissolved oxygen in water samples.
4. Analytical skills in determining the molecular weight and degree of polymerization using Ostwald's viscometer.
5. Knowledge in quantitative analysis of the acid/base.

4.Pre-requisite:

Introduction to chemistry lab

5. Link to other courses

Fundamental to B.Tech. Courses.

6.Course Content:

LIST OF EXPERIMENTS

1. Estimation of hardness of Water by EDTA.
2. Determination of DO in water (Winkler's Method).
3. Estimation of Chloride in Water sample (Argentometric).
4. Conductometric precipitation titration using BaCl_2 Vs Na_2SO_4
5. Determination of molecular weight and degree of polymerization using Ostwald viscometer
6. Conductometric titration (mixture of acids and base).

TOPICS BEYOND THE SYLLABUS

- 1..Determination of COD of the sample of water/sewage
- 2..Determination specific and equivalent conductance at infinite dilution of a given electrolyte

Course Code: U1GEB27

**Course Name: PRINCIPLES OF ELECTRICAL AND ELECTRONICS
ENGINEERING LAB**

L	T	P	C
0	0	3	2

Designed for: Year: I Semester: I

Credits:2

1.PREAMBLE:

This course teaches the implementations of few electrical wiring, measurement of few electrical quantities including Cathode ray operations, device characteristics & logic gates thus enabling every emerging engineer to understand basic principle of electrical & electronics irrespective of their branch.

2.COURSE EDUCATIONAL OBJECTIVES:

- To make students familiar about the various wiring methods and specific wiring like godown wiring
- To make students familiar about practical measurements of few important electrical quantities
- To make students understand about basic electronic circuit components and their characteristics study
- To make students understand about the operation of CRO
- To make students understand about the various logic gates.

3. COURSE OUTCOMES :

After successful completion of this course, students will be able to

- Reenact various wiring methods and how to make wiring of a godown.
- Understand what a resistive load is, and will be able to measure few electrical quantities like voltage, current and apply the skill in real life situations.
- Discriminate & recognize basic electronic circuit components and their characteristics study
- Check the operation of CRO
- Distinguish the various logic gates.

4.PRE-REQUISITES:

- Basic Electrical & Electronics concept covered in higher secondary level.

5.LINK TO OTHER COURSES:

Various laboratory courses based upon electrical & electronics concept of circuit branches and laboratory courses based upon electrical machines and digital electronics concept of non circuit branches

6. COURSE CONTENT

LIST OF EXPERIMENTS:

CYCLE I

1. Study of basic electrical and electronic components.
2. Godown Wiring
3. Stair case wiring
4. Fluorescent lamp wiring.
5. Measurement of Electrical quantities (Voltage, current, power) using load

MODEL PRACTICAL EXAMINATION I

CYCLE II

6. Characteristics of PN junction Diode.
7. Characteristics of BJT (any one configuration).
8. Characteristics of zener diode.
9. Study of CRO.
10. Verification of logic gates

MODEL PRACTICAL EXAMINATION II

LABORATORY REQUIREMENT FOR A BATCH OF 30 STUDENTS

HARDWARE:

- 2 nos. of incandescent lamp, 230V, 100W/40W.
- 2 nos. of florescent lamp 4ft(fixture),40 Watt.
- 2 nos of lamp holder, Pendent type
- 4 nos. of SPDT switch 230V, 5 Amp.
- 2 nos. moving iron (MI) (0-10)A ammeter & (0-300)V voltmeter.
- 2 nos. wattmeters 300V 10A, UPF.
- Few connecting silk wires.
- 2 nos. of LED
- 2 nos of RPS , (0-30) V.
- 1 no. resistance 680 Ω .
- 2 nos. DC voltmeter of (0-1),(0-15) V,volts no.
- 2 nos.DC ammeter of (0-100) μ A,(0-50) μ A
- 6 nos. bread boards,
- 2 P-N junction diode,IN 4001
- 2 nos . of BJT(BC 107)
- 2 nos. zener(IN 3828) diode
- 2 CRO's 30 MHz
- Few Connecting wires 1/18''
- 4 nos resistances of 1 K Ω .10K Ω .
- 2 nos of IC7408,7432,7404, 7402,7486,7410,
- 2 nos. function generator, 3 MHz.
- 2 nos. capacitors each ,1000 μ F.1 μ F.
- 1 no.1-Ph. 5 kW resistive load
- 1 no auto transformer .1-ph, (0-270)V
- 1 step down transformer 230V/(0-9)V
- 1 no.Choke, 40 W,230 Volt
- 1 no.Starter

SOFTWARE

Nil

Course Code: U1GEB28

Course Name: COMPUTER PRACTICE LABORATORY

L	T	P	C
0	0	4	2

Designed for: Year: I Semester: I

1. PREAMBLE

This course teaches the working methodology for Ms office and C-Programming structures.

2. COURSE EDUCATIONAL OBJECTIVES:

Students undergoing this course are expected to:

- To Practice the concepts of MS Word and MS excel
- To learn the C control structure and functions.
- To study the C Pointers and file system.

3. COURSE OUTCOMES:

Students undergoing this course are able to:

- Design a document using MS_WORD.
- Demonstrate and compute the data using Spread Sheet.
- Implement the basic elements of a C program including arithmetic and logical operators, functions, control structures, and arrays
- Execute a walk-through of a program containing pointers, Structures, Unions and File Concepts.
- Design a program related to challenging questions.

4. PRE-REQUISITES:

- Basic Computer and C Programming knowledge.

5. LINK TO OTHER COURSES

- All Programming Languages lab
- Data Structure Lab
- System Software Lab

6. COURSE CONTENT

Cycle - I

1) Word Processing

- a. Document creation, Text manipulation with Scientific notations.
- b. Table creation, Table formatting and Conversion.
- c. Mail merge and Letter preparation.
- d. Drawing - flow Chart

2) Spread Sheet

- a. Chart - Line, XY, Bar and Pie.
 - b. Formula - formula editor.
 - c. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
 - d. Sorting and Import / Export features
3. Find whether a given number is odd or even.
 4. Find whether a given number is prime or not.
 5. Design an arithmetic calculator using Switch-Case.
 6. Find largest and smallest elements in an array.

Cycle - II

7. Demonstrate Looping and Control structures.
8. Demonstrate the String functions.
9. Find a Factorial of a number of ranges between 1 to 41 using Recursive function.
10. Demonstrate the Structures and Unions for employee salary.
11. Perform pointer arithmetic Operations.
12. Program to develop student's information using file concept.



SCHOOL OF BASIC SCIENCES



Curriculum and Syllabus

For

B.Tech I Semester

Non Circuit Branches (AERO, AUTO, CIVIL, MECH)

Academic Year (2014-2015)

**I YEAR CURRICULUM AND SYLLABUS
NON CIRCUIT BRANCHES (MECH, AERO, AUTO, CIVIL)**

**SEMESTER I
(Non Circuit Branches)**

SUB.CODE	SUBJECT	L	T	P	C
THEORY					
U1GEB20	ENGINEERING ENGLISH – I	2	0	0	2
U1GEB21	ENGINEERING MATHEMATICS - I	3	1	0	4
U1GEB22	ENGINEERING PHYSICS – I	2	0	0	2
U1GEB23	ENGINEERING CHEMISTRY – I	2	0	0	2
U1GEB24	PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING	3	0	0	3
U1GEB34	ENGINEERING GRAPHICS	3	1	0	4
PRACTICAL					
U1GEB26	ENGINEERING PHYSICS AND CHEMISTRY LABORATORY-I	0	0	4	2
U1GEB27	PRINCIPLES OF ELECTRICAL & ELECTRONICS ENGINEERING LABORATORY	0	0	3	2
U1GEB37	ENGINEERING PRACTICES LABORATORY	0	0	3	2
TOTAL CREDITS					23

L – Lecture; T – Tutorial; P – Practical; C – Credit

Course Code: U1GEB20
Course Name: Engineering English I
Designed For: First year semester I (Common to all Branches)

L	T	P	C
2	0	0	2

8. PREAMBLE:

This course expands students' practical vocabulary, ability to communicate effectively in oral English in a variety of situations with the help of pronunciation, intonation, grammar and sentence structure and also trained them to participate in group discussion, presentation, discussion of current events and problems-offering suggestions/ solutions/ opinions.

9. COURSE EDUCATIONAL OBJECTIVES:

Students undergoing this course are expected:

- To develop their basic communication skills in English
- To achieve specific linguistic and communicative competence
- To acquire relevant skills and function efficiently in a realistic working context
- To inculcate the habit of reading for pleasure

10. COURSE OUTCOMES

On successful completion of this course, students will be able to:

- Respond orally to the written works, grounding their ideas in the text.
- Formulate open-ended questions in order to explore a topic of interest
- Training to adhere in analytical and critical dialogue orally
- Engage in daily, meaningful reading tasks in English class and/or at home.
- Develop interpersonal skills on current problems and events

11. PRE-REQUISITES

Admission to B.Tech.Programme

12. LINK TO OTHER COURSES

Fundamental to B.Tech.courses.

13. COURSE CONTENT

UNIT I TECHNICAL GRAMMAR

9

Parts of Speech, Time, Tense and Aspect, Active and Passive Voice, WH Questions, Question Tag-Concord

UNIT II INFORMATION SKILLS

9

Letter writing, Formal and Informal letters, Transformation of information and Transcoding (Pie chart, bar chart & classification table), Process Description, Note taking, Note Making, Paragraph Writing

UNIT III LANGUAGE OUTLINE

9

Definitions and Extended Definitions, Hints Development, Checklist, Dialogue Writing, Report, its importance and Report Writing

UNIT IV LANGUAGE SKILLS

9

Process of Communication and factors, Verbal and Non-verbal Communication, Listening Skills, Reading Skills, Speaking skills, Writing skills

UNIT V INTUITION SKILLS

9

Creative thinking, Critical thinking, Discussion of current affairs and events and problems, Offering suggestions/ solutions/ sharing opinions

14. LEARNING RESOURCES

7.1. Text Book

3. Andera, J.Rutherford. Basic Communication Skills for Technology, Second edition, Pearson Education,2007

4. Butterfield, Jeff. Soft Skills for Everyone, Cengage learning, Canada,2011

7.4.Reference Books

5. Bailey, Stephen. Academic Writing: A Practical Guide for Students. New York: Rutledge, 2011.

6. Morgan, David and Nicholas Regan. Take-Off: Technical English for Engineering. Garnet Publishing Limited. New York: Longman, 2008.

7. Ganesan. S, Persis Mary T &Subhashini.B. Communication in English, Himalaya Publishing House, Mumbai, 2009.

8. Pickett, Nell Ann, Ann A.Laster and Katherine E.Staples. Technical English: Writing, Reading and Speaking. New York: Longman, 2009.

7.5.Online Resources

9. <http://www.lonestar.edu/useful-websites-for-students.htm>

10. www.english-for-students.com/

11. www.britishcouncil.org

12. www.sfsu.edu/~puboff/onestop.htm

13. www.uefap.com

14. www.eslcafe.com
15. www.listen-to-english.com
16. www.owl.english.purdue.edu

Course Code: U1GEB21

Course Name: ENGINEERING MATHEMATICS-I
Common to all Branches

L	T	P	C
3	1	0	4

8. PREAMBLE: .

This course provides an introduction to the basic concepts and techniques of multivariable calculus and sequence and series, matrices, emphasizing their inter-relations and applications to engineering, and science areas; introduce students to cognitive learning in mathematics; and develops problem solving skills with both theoretical and engineering oriented problems.

9. PRE-REQUISITES:

Admission to B.Tech. Programme

10. LINKS TO OTHER COURSES

Fundamental to B.Tech. courses.

11. COURSE EDUCATIONAL OBJECTIVES

- To develop the basic mathematical knowledge and computational skills of the students in the areas of applied mathematics.
- To develop the skills of the students in the areas of several variable Calculus, Matrices, and sequences and series.
- To serve as a pre-requisite mathematics course for post graduate courses, specialized studies and research.

12. COURSE OUTCOMES

On successful completion of this course students will be able to:

- Calculate eigen-values and eigen-vectors, apply Caley-Hamilton theorem, and diagonalize of symmetric matrices and demonstrate the nature of quadratic forms.
- Discuss the convergence and divergence of sequence and series of real numbers using various tests.
- Demonstrate understanding of the derivatives of functions of several variables, viz., partial and total differentiation, and differentiation of implicit functions and optimize the functions of several variables using Hessian method and Lagrangian method.
- Evaluate double integration and triple integration using Cartesian, polar co-ordinates and the concept of Jacobian of transformation from one coordinate system to another coordinate system.
- Identify the improperness in integrals and evaluate the integrals using appropriate mathematical tools and how to apply beta and gamma integrals keeping improperness in mind.

13. COURSE CONTENT

UNIT I MATRICES

L- 9 + T-3

Characteristic equation – Eigen-values and Eigen-vectors of a real matrix – Statement of Cayley-Hamilton theorem – Applications of Cayley-Hamilton theorem in finding the inverse of a non-singular matrix and the power of a square matrix – Diagonalization of symmetric matrices – Nature of Quadratic forms

UNIT II SEQUENCES AND SERIES

L- 9 + T-3

Sequences – Convergence of series – Series of positive terms – Tests for convergence (n-th term, ratio, comparison, root and integral tests) and divergence - Leibnitz test for alternating series –Series of positive and negative terms - Absolute and conditional convergence– Power series – Taylor and Maclaurin series

UNIT III DIFFERENTIAL CALCULUS OF SEVERAL VARIABLES L- 9 + T-3

Limits and continuity- Partial Derivatives – Total derivative – Differentiation of implicit functions – inverse functions – Jacobian – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers

UNIT IV INTEGRAL CALCULUS OF SEVERAL VARIABLES L- 9 + T-3

Double integrals- Change of order of integration – Double integrals in polar coordinates – Triple integrals – Area as a double integral – Volume as a triple integral

UNIT V IMPROPER INTEGRALS

L- 9 + T-3

Meaning of improper integrals - Beta and Gamma functions – properties –Reduction formula for $\Gamma(n)$ – Relation between gamma and beta functions - Evaluation of integrals using Beta and gamma functions – simple problems

BEYOND THE SYLLABUS

Vector spaces-linear dependence-linearly independent vectors-Dimension of a vector space-Inner product of vector space-orthogonal vectors-Norm of a vector-Gram-Schmidt orthogonalization process

14. LEARNING RESOURCES:

7.1 Required Resources:

Bridge Course notes. (10 Lectures)

Hyghes-Hallett, Gleason, McCallum et al.(15 authors) *Single Variable Calculus* (6th Edn) John Wiley and Sons New York, 2013

TEXT BOOKS

3. Grewal B.S., *Higher Engineering Mathematics*, Khanna Publishers, New Delhi, 41st Edition, 2011.
4. Jain R.K and Iyengar, S.R.K *Advanced Engineering Mathematics*, 3rd edition, Narosa Publishing House, 2009.

7.2 Recommended Resources

14. Adrian Banner. *The Calculus Lifesaver*, Princeton University Press, Princeton, USA, 2007.
15. Alan Jeffrey. *Advanced Engineering Mathematics*, Harcourt/Academic Press, New York, 2002.
16. Hyghes-Hallett, Gleason, McCallum et al. *Single Variable Calculus* (6th Edn) John Wiley and Sons New York, 2013.
17. Hyghes-Hallett, Gleason, McCallum et al. *Multivariable Variable Calculus* (6th Edn) John Wiley and Sons New York, 2013.
18. Dennis G. Zill , Warren S. Wright and Michael R.Cullen. *Advanced Engineering Mathematics* (4th Edn) Jones a& Bartlett Learning, Canada, 2011.
19. James Stewart. *Multivariate Calculus, Concepts and Contexts.* (3rd Edn) Thomson/Brooks/Cole, Canada, 2005.
20. John Bird. *Higher Engineering Mathematics*, (5th Edn) Elsevier , Burlington,USA, 2006.
21. K.A.Stroud and D.J.Booth. *Advanced Engineering Mathematics* (4th Edn) Palgrave/MacMillan, USA. 2003.
22. Soo T. Tan. *Single Variable Calculus*, Brooks/Cole, Cengage Learning, Belmont, USA, 2010.
23. Soo T. Tan. *Multivariable Calculus*, Brooks/Cole, Cengage Learning, Belmont, USA, 2010.
24. Duraipandian P, Udayabaskaran S and Karthikeyan T, *Engineering Mathematics* (I Year) Muhil Publishers, 2010.
25. Kreyszig, E. *Advanced Engineering Mathematics*, (9th Edn.), John Wiley and sons, New York 2005.
26. Peter O' Neil, *Advanced Engineering Mathematics*, Cengage Learning, Boston, USA, 2012.

7.3 Web Resources

This course uses exclusively for providing electronic resource, such as lecturer notes, assignment papers, and sample solutions. Students should make appropriate use of this recourse.

http://en.wikipedia.org/wiki/Eigenvalues_and_eigenvectors

<http://www.math.hmc.edu/calculus/tutorials/eigenstuff/>

https://www.khanacademy.org/math/linear-algebra/alternate_bases/eigen_everything/v/linear-algebra--introduction-to-eigenvalues-and-eigenvectors

<http://ceee.rice.edu/Books/LA/eigen/>

<http://www.mathresource.iitb.ac.in/linear%20algebra/mainchapter10.3.html>

www.nptel.in

Mathematics Websites: The following information on the Mathematics Web sites will be an additional source of information for references and historical development of the Mathematics. Some biographies of outstanding mathematicians are also available. This is the common information for both teachers and students of Mathematics.

13. <http://scienceworld.wolfram.com/biography/topics/Mathematicians.html>
14. <http://teachers.sduhsd.k12.ca.us/abrown/index2.html>
15. <http://www.maths.tcd.ie/pub/HistMath/People/RBallHist.html>
Mathematicians of the 17th and 18th Centuries
16. <http://www.geometry.net/math.html>
A Geometry Site
17. http://www-history.mcs.st-andrews.ac.uk/history/Indexes/Full_Alph.html
Site of Biographies of Mathematicians
18. <http://mathforum.org>
This site includes resources in mathematics for school students, teachers, parents. Also contains some research related material on mathematics teaching and learning. The 'Problems of the Week' contains problems at different levels of mathematics. It includes selected alternative solutions posted by problem solvers which is really nice. The 'Ask Dr. Math' gives useful explanations of math concepts and the discussion groups are about teaching methods.
19. <http://www.cut-the-knot.org>
Contains interesting puzzles, problems, theorems, proofs, etc. Also has links to other good sites (including all those listed below).
20. <http://nrich.maths.org>
The site is run by the University of Cambridge. It contains problems for different age groups (5 to 18) that one can post solutions to. Selected solutions are published at the website. One can also post questions. There is an archive of questions posted earlier with answers (in blue coloured font). There are also articles, features, etc.
21. <http://archives.math.utk.edu/>
A fairly comprehensive archive: contains teaching materials, public domain software, shareware, books, articles, etc.
22. <http://www-groups.dcs.st-and.ac.uk/~history/>
The MacTutor history of mathematics archive. The best known website for historical information about mathematicians and mathematics.
23. <http://www.maa.org/>
This is the website of the Mathematical Association of America. Contains useful resources for college mathematics teachers including book reviews.
24. <http://e-math.ams.org/> Website of the main professional organization in mathematics: American Mathematical Society. The journal 'Notices of the AMS' is online. Plus Interesting essays.

Course Code: U1GEB22

Course Name: ENGINEERING PHYSICS – I

Designed for: Year: I Semester: I

L	T	P	C
2	0	0	2

1. PREAMBLE

This course U1GEB22; Engineering Physics-I, explores various fundamental aspects of Physics.

8. COURSE EDUCATIONAL OBJECTIVES

- To understand the basic laws of physics and their applications in engineering and technology.
- To develop scientific temper and analytical capability.
- To solve various engineering problems.

9. COURSE OUTCOMES

On successful completion of this course students will be able to:

6. Discuss the basic physics concepts and its applications in a day to day life; demonstrate the knowledge in ultrasonic applications and its importance.
7. Identify information to relate and apply the utilizations of the electron beams in modern technologies such as CRT, CRO etc.
8. Explain the basic understandings of the matter, crystal structure and its fundamental properties including crystal systems, Miller indices, and X-Ray production.
9. Demonstrate the conductivity nature of metals and the classification of the solids learned from The Band Theory of Solids.
10. Identify the importance of the widely used current technologies such as mobile phones, solar cells for which semiconductor technology is essential.

10. PRE-REQUISITE:

Admission to B.Tech. Programme

11. LINKS TO OTHER COURSES

Fundamental to B.Tech. courses.

12. COURSE OUTLINE

UNIT-I: Acoustics

8L + 1T

9

Introduction, sound waves - Pitch and Intensity. Reflection of sound waves, Sabine formula, absorption of sound, reverberation Theory. Ultrasonic's –Acoustic Grating – production - magnetostriction oscillator and piezoelectric oscillator, Properties and applications

UNIT -II: Electron Optics

8L + 1T

9

Introduction, Electron-refraction-Bethe's law, Electron Gun and Electron Lens, Cathode Ray Tube and Cathode Ray Oscilloscope, Cyclotron, Bainbridge Mass Spectrograph, Electron Microscope, Applications.

UNIT -III: Crystal structures and X-Rays**8L + 1T****9**

Introduction, Space lattice, unit cell, lattice parameters, Bravais Lattice - Crystal systems. Characteristics of Unit cell. Miller indices of planes. X-Rays –production, Bragg’s Law. Powder crystal method and rotating crystal method.

UNIT -IV: Band Theory of Solids**8L+ 1T****9**

Introduction, Electrical conduction, conductivity, drift velocity, influence of external factors on conductivity. The Band Theory of solids, Energy Bands, Energy Gap. Classification of solids, Energy Band structure of a conductor. Fermi-Dirac distribution function and Fermi Energy. Energy Band structure of an Insulator and semiconductor.

UNIT -V: Semiconductors**8L+ 1T****9**

Introduction, Types- Intrinsic and Extrinsic semiconductors. Intrinsic carriers-electron and hole concentrations. Fermi level in intrinsic carrier density, Conductivity, Doping of impurities-N-type and P-Type. Temperature variation-law of mass action-Charge neutrality condition- Fermi level in extrinsic semiconductor-Hall effect-Applications.

Beyond the syllabus

Acoustics of buildings. Sonography, Cathode Ray Tube, Magnetic bottle, Modes of laser beam, Classification of hologram, Bragg’s X-Ray spectrometer, Semiconductors in Electronics.

13. LEARNING RESOURCES**7.1 Text Books**

3. M.N. Avadhanulu and P.G. Kshirsagar ,A Text Book of Engineering Physics, S.CHAND and Co, 2012.
4. Gaur and Gupta, Engineering Physics , DhanpatRai publications, 2009

7.2 References Books

6. S.O.Pillai ,Solid State Physics, New age international publications, 2010.
7. M.Arumugam, Engineering Physics, Anuradha publications, 2009.
8. Charles Kittel ,Introduction to Solid State Physics ,Wiley India publications, 2009.
9. Introduction to Solids –L.Azaroff TMH, 33rd Reprint 2009.
10. Materials Science and Engineering – William Calister – Wiley India- Sixth Edition 2009.

7.3 Web Resources

7. <http://deploy.virtual-labs.ac.in/labs/phy14/>
8. <http://ocw.mit.edu/courses/physics>
9. <https://www.khanacademy.org/science/physics>
10. www.skilledup.com
11. www.nsf.gov/news/classroom/physics.jsp
12. <http://www.crscience.org/e>

Course Code: U1GEB23

Name of the Course : ENGINEERING CHEMISTRY-I

L	T	P	C
2	0	0	2

Designed for: Year :1 Sem :1st

1. PREAMBLE

This course U1GEC04; Engineering Chemistry-I, imparts a sound knowledge on the principles of chemistry involving different application oriented topics required for all branches of engineering.

8. COURSE EDUCATIONAL OBJECTIVES

Students undergoing this course are expected to be conversant with:

4. A sound knowledge on the principles of chemistry and its applications in industries as well as research oriented topics useful for project submission of all branches of engineering.
5. Various aspects and principles of water treatment, surface chemistry, fuels and combustion along with preparation and application of important engineering materials and polymers.
6. Development of scientific approach towards solving time bound theoretical and experimental problems and ability to work in a team both as members and leaders.

9. COURSE OUTCOMES

After completing first semester, students from all branches of engineering will:

- Demonstrate knowledge on the design of boilers, conditioning methods and the various treatments of water for public use.
- Demonstrate knowledge concerned with the various industrial applications of adsorption techniques.
- Describe various aspects related to Engineering polymers and their application in industries, chemical compositions and uses.
- Describe Engineering materials and their significance in the present day life.
- Demonstrate knowledge on fuels, their manufacturing and analysis.

10. PRE-REQUISITE:

Admission to B.Tech. Programme

11. LINKS TO OTHER COURSES

Fundamental to B.Tech. Courses.

12. COURSE CONTENT

UNIT- I WATER TREATMENT AND TECHNOLOGY

9

Introduction- Hardness-Types and estimation by EDTA method-Boiler feed water – requirements- disadvantages of using hard water in boilers- internal conditioning (phosphate, calgon and carbonate conditioning methods)-external conditioning method-demineralization process – desalination-reverse osmosis –Electrodialysis- Domestic water treatment.

UNIT–II SURFACE CHEMISTRY

9

Introduction-types of adsorption-adsorption of gases on solids, solute from solution-adsorption isotherm- Freundlich and Langmuir adsorption isotherm- BET basics and industrial applications. Role of adsorbent in catalysis- ion exchange reaction- chromatography – role of activated carbon in pollution abatement of air and waste water- Industrial applications of adsorption

UNIT–III POLYMERS

9

Polymer, Classification based on, origin, structure, chemical structure, Degree of polymerization - Types of polymerization – Thermosetting and Thermoplastic polymers and their applications- Molecular weight of the polymer-Number average, weight average by viscosity method.Glass transition temperature-Conducting polymer and Biopolymers-Polymeric composites.

UNIT–IV MATERIALS CHEMISTRY

9

Abrasives-Classification and properties, Refractories-Classification and properties, Lubricants-Classification and properties. Organic electronic materials-liquid crystals, non-linear optics and LED, Nano materials-Buckminster fullerenes, CNT'S(Single walled carbon nano tubes and Multi-walled carbon tubes), advantages and applications-Nano composites

UNIT–V FUEL AND COMBUSTION CHEMISTRY

9

Classification, Characteristics of fuel, Comparison between Solid, liquid and gaseous fuels, Combustion processes-Bomb calorimeter -Calorific value: gross and net calorific values.Solid Fuels: Coal: Classification, Analysis: Proximate and Ultimate analysis of coal and their importance, Metallurgical coke: Properties, Manufacture by Otto Hoffman process. Synthetic Petrol: Fischer-Tropsch process and Bergius Process, Knocking and chemical structure, octane number and cetane number and their significance, Gaseous Fuels: Natural gas, artificial gas (water gas, producer gas, coal gas). Flue gas analysis – Orsat apparatus

• TOPICS BEYOND THE SYLLABUS

4. Fuels used in rockets
5. Hydrogen as emerging alternate fuel
6. Application of polymeric composites in aerospace and automobile industry

13. LEARNING RESOURCES

7.1 TEXT BOOKS

4. P.C.Jain and Monica Jain - “Engineering Chemistry” DhanpatRai Pub, Co., New Delhi (2002).
5. S.S.Dara- “A Text book of Engineering Chemistry” S.Chand&Co.Ltd., New Delhi (2006).
6. A. Ravikrishnan– Engineering Chemistry, Sri Krishna Publication, Chennai.

7.2 REFERENCES

4. B.K.Sharma - "Engineering Chemistry", Krishna Prakasan Media (P) Ltd., Meerut (2001)
5. B.Sivasankar - "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd. New Delhi (2008).
6. B.R.Puri, L.R. Sharma, S.Pathania - "Principles of physical Chemistry" (2000).

7.3 Web Resources

- 1) <http://en.wikipedia.org/wiki/Electrochemistry>
- 2) [http://en.wikipedia.org/wiki/Water Treatment](http://en.wikipedia.org/wiki/Water_Treatment)
- 3) <http://en.wikipedia.org/wiki/Spectroscopy>

Course Code: U1GEB24

Name of the Course :PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING

Designed for: Year :1 Sem :1st

L	T	P	C
3	0	0	3

2. PREAMBLE

This course , provides an introduction to understand the concepts and working principles of circuit elements and laws underlying DC,AC magnetic circuits & various common electrical machines for the budding engineers, . Moreover it emphasizes On the concept and working of commonly used electronic devices ,digital circuits and communication topologies to work them in the cutting-edge technology in the field of respective specializations & acquire the basic skills of approaching and dealing with real life situations and solving operating problems.

2. COURSE EDUCATIONAL OBJECTIVES

- To make students understand about the basic laws, concepts and allied terminologies pertaining to D.C Circuits & magnetic circuits
- To impart knowledge to students regarding the fundamentals of alternating current Rules and associated terminologies and it's behavior with fundamental elements like resistance inductance and capacitance.
- To make student familiarize about the various basic ac & dc rotating machines and transformers.
- To make students familiarize about the basic knowledge in state solid electronic devices and digital logic gates.
- To make students aware about fundamental principles underlying the working of various communication systems, modulation procedure and spectral bands.

3.COURSE OUTCOMES

On successful completion of this course students will be able to:

- Enumerate the basics of electric circuit elements , related terminologies and fundamental laws governing the operation and analysis of those

circuits with DC sources and laws , and also concepts related to magnetic circuits.

- Develop knowledge about the concept of single phase alternating current ,it's generation and circuit behavior with basic elements like resistance, inductance, & capacitance.
- Cite the operating principles and identify various ac , dc machines and transformers.
- Illustrate common solid state devices & and access their characteristic and explain the basic of logic gates.
- Correlate & summarize the fundamentals concepts behind electronic communication systems

4. PRE-REQUISITE

Basic intermediate second year physics .

5. Links to Other courses

- Circuit branches related courses
- Allied courses of non circuit branches based on electrical and electronic concepts .

6. COURSE CONTENT

UNIT I - D.C.CIRCUITS &MAGNETIC CIRCUITS

9

Electrical quantities, Ohm's Law, Series and parallel combinations, Kirchhoff's laws, Node and Mesh Analysis - Star - Delta Transformation-Definition of MMF, Flux and reluctance - Leakage factor - Reluctances in series and parallel (series and parallel magnetic circuits) - Electromagnetic induction - Fleming's rule - Lenz's law - Faraday's laws

UNIT II - A.C.CIRCUITS

9

. Sinusoidal functions - RMS (effective) and Average values- Phasor representation - J operator – sinusoidal excitation applied to purely resistive, inductive and capacitive circuits - RL, RC and RLC circuits- Introduction to three phase circuits.

UNIT III –ELECTRICAL MACHINES

9

Definition of Electrical Machines-Principle and Operation Of Generator and Motor, types of DC and AC Machines ,EMF equation of DC machines, Principle of Transformer, EMF equation of transformer-Principle of Induction Motor, Synchronous Motor

UNIT IV - BASIC ANALOG AND DIGITAL ELECTRONICS

9

PN junction Diode - Rectifiers - Half wave and full wave rectifiers, Bipolar Junction Transistor - Characteristic of FET, MOSFET, Silicon Controlled Rectifiers and Triac - Basic Logic Gates- Universal Logic Gates

UNIT V - BASIC COMMUNICATION SYSTEMS

9

Basic Communication systems- Advantages of digital system- Elements of communication system - Electromagnetic spectrum - Modulation concepts

BEYOND THE SYLLABUS

- Construction and operation of IGBT
- GSM and CDMA Technology
- Basic operation of machines
- Introduction to network theory

TEXT BOOKS

1. Mittle.B.N, AravindMittle, "Basic Electrical Engineering", Tata McGraw Hill", 2nd Edition. Sep 2005.
2. Theraja.B.L, "Fundamentals of Electrical Engineering and Electronics", S.Chand& Co., 1st Multicolor Edition, 2006 (Reprint 2009).
3. Sedha.R.S, A Text book of Applied electronics, 2nd Edition, S.Chand& company, 2005.
4. Bhattacharya.S.K and Renuvig, Principles of electronics, 3rd Edition, S.K.Kataria& Sons, 2002.

REFERENCE BOOKS

1. Smarajit Ghosh, "Fundamentals of Electrical and Electronics Engineering", PHI Learning Private Ltd, 2nd Edition, 2010.
2. Wadhwa.C.L, "Basic Electrical Engineering", New Age International, 4th Edition, 2007. (Reprint June 2010)
3. AbhijitChakrabarti, SudiptaNath&Chandan Kumar Chanda, "Basic Electrical Engineering", Tata McGraw Hill, 1st Edition, 2009.
4. T. Thyagarajan, —Fundamentals of Electrical Engineering, SciTech Publications, 5th Edition, Reprint Jan 2010.

Course code : U1GEB34
Course name : ENGINEERING GRAPHICS
Designed for : I year (common to all the branches)

L	T	P	C
3	1	0	4

1. PREAMBLE

This course provides an introduction to the basic concepts of drawings and different views of an object. One of the best ways to communicate one's ideas is through some form of picture or drawing. So that it is called as Universal language of Engineers. The purpose of this is to give the basics of engineering sketching and drawing. Students can able to learn the isometric and perspectives of an object in detail.

2. COURSE EDUCATIONAL OBJECTIVES

- To familiarize the students in basic concept and necessity of conic sections, projections and developments of objects.
- To develop the imagination and drafting skills of students and let them understand the internal features of the object.

3. COURSE OUTCOMES

Students undergoing this course are able to

1. Construct ellipse, parabola, hyperbola and draw free hand sketching of orthographic views.
2. Construct orthographic projections of points, straight lines and planes.
3. Construct projections of simple solids.
4. Develop true sections and lateral surfaces of simple solids.
5. Construct isometric and perspective projections of simple solids.

4. PRE-REQUISITE

Basic Mathematics.

5. LINKS TO OTHER COURSES

Engineering Design, Machine Design and CAD

6. COURSE CONTENT

UNIT I: CONIC SECTIONS AND FREE HAND SKETCHING

9+3

Construction of ellipse (concentric circle and eccentricity methods), construction of parabola (rectangle and eccentricity methods), construction of hyperbola (eccentricity method)

Free-hand sketching of orthographic views of pictorial views of solids – free-hand sketching of pictorial views of solids given the orthographic views.

UNIT II: PROJECTION OF POINTS, STRAIGHT LINES & PLANES **9+3**

Orthographic projections of points, orthographic projections of straight lines located in the first quadrant only – determination of true lengths and true inclinations – orthographic projections of polygonal surface and circular lamina inclined to both reference planes.

UNIT III: PROJECTIONS OF SOLIDS **9+3**

Projections of simple solids (prisms, pyramids, cylinder and cone) when the axis is inclined to one reference plane by change of position and change of reference line methods.

UNIT IV: SECTIONS OF SOLIDS & DEVELOPMENT OF SURFACES **9+3**

Sections of solids (prisms, pyramids, cylinder and cone) in simple vertical position by using cutting plane inclined to one reference plane and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinder and cone – development of lateral surfaces of solids with cylindrical cutouts perpendicular to the axis.

UNIT V: ISOMETRIC & PERSPECTIVE PROJECTION **9+3**

Principles of isometric projection - isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones – isometric view of combination of two simple solids. Perspective projection of prisms, pyramids and cylinder by visual ray method and vanishing points method.

TOTAL: 45+15(Tutorial) = 60 periods

BEYOND THE SYLLABUS

- Scales and Dimensioning Principles
- Intersection of solids
- Computer Aided Drafting
- Development of solid surfaces with square cut –out
- Orthographic projections of polygonal surface and circular lamina inclined to both reference planes
- Development of lateral surfaces of solids with square and cylindrical cut outs perpendicular to the axis.

7. LEARNING RESOURCES:

This course uses various resources, such as lecturer notes, materials from electronic media, assignment papers, and sample solutions. Students should make appropriate use of these resources.

7.1 Required Resources:

TEXT BOOKS

1. K.V. Natarajan, A text Book of Engineering Graphics, Dhanalakshmi Publisher, Chennai – 42, 2009
2. Venugopal K. –Engineering Graphics, New Age International (P) Limited, 2002.

7.2 Recommended Resources:

1. Warren J. Luzadder and Jon. M. Duff, - Fundamentals of Engineering Drawing, Prentice Hall of India Pvt., Ltd., Eleventh Edition, 2001.
2. B. Bhattacharyya, S.C. Bera, Engineering Graphics ., I.K. International Pvt Ltd., 2009
3. M.S. Kumar ., Engineering Graphics.,Dd Publications, 2008
4. Jeyapoovan.T., Vikas Publishing House Engineering Graphics with using Auto CAD,2007
5. BIS code: SP 46:2003 Engineering Drawing practice for Schools & Colleges

7.3 Web Resources:

1. <http://www.teachertube.com>, Engineering Graphics.
 2. <http://www.ustudy.in>, Engineering Graphics
 3. <http://nptel.iitm.ac.in/>
 4. http://www.engr.colostate.edu/~dga/video_demos/index.html
 5. <http://www.allbookez.com/mechatronics-lecture-notes/>
 6. <http://oneclass.com#!/notes>
 7. https://engineering.purdue.edu/ME588/lecture_notes.html
- <http://www.slideshare.net/DrSKazi/lecture-07-mechatronic-design-concepts>

Course Code: U1GEB26

Course Name: ENGINEERING PHYSICS AND CHEMISTRY LAB – I

Designed for: Year: I Semester: I

L	T	P	C
2	0	0	2

ENGINEERING PHYSICS LAB – I

7. PREAMBLE

The course provides knowledge for conducting experiments to measure properties like moment of inertia, focal length, wave length, velocity and Young's modulus.

8. COURSE EDUCATIONAL OBJECTIVES

- To impart skills in measurements and hand on operation
- To design and plan the experimental procedure and to record and process the results.
- To reach non trivial conclusions of significant of the experiments.

9. COURSE OUTCOMES

After the completion of the experiments in Physics lab, students will be able to

6. Relate and apply the moment of inertia of the disc.
7. Translate sensory input into physical tasks
8. Recognize standards to perform a skill or task correctly
9. Use standards to evaluate their own performance and make corrections.
10. Evaluate information based upon standards and criteria values.

10. PRE-REQUISITE:

Admission to B.Tech. Programme

11. LINKS TO OTHER COURSES

Fundamental to B.Tech. courses.

12. Course Content:

6. Torsional Pendulum

To determine the moment of inertia of the disc and the rigidity modulus of the wire by Torsional oscillations.

7. Newtons' Rings

To find the focal length of a lens by forming Newton's ring.

8. Laser Grating

- (i) Determination of wavelength of Laser using Grating and Particle size determination
- (ii) Determination of Numerical Aperture and Acceptance angle of an Optical Fibre

9. Ultrasonic Interferometer

Determination of Velocity of ultrasonic waves in a liquid and compressibility of the liquid.

10. Young's Modulus – Non-Uniform Bending

To determine Young's modulus of the material of the beam by Non uniform bending method.

U1GEB26 ENGINEERING CHEMISTRY LAB -1

L	T	P	C
0	0	2	1

1.Preamble :This course provides basic concept for water quality analysis.

2.Course Educational Objectives:

Students undergoing this course are expected to be conversant with basic titration set up and methodologies for determining strength, hardness and alkalinity of various unknown solutions and water samples.

3.Course Outcomes:

After completing first semester, students from all branches of engineering will possess:

6. Gain acquaintance in the determination the amount of hardness and chloride in the various samples of water for general purpose and their use it industries involving boilers.
7. Skills in estimating acidity/alkalinity in given water samples.
8. Expertise in estimating dissolved oxygen in water samples.
9. Analytical skills in determining the molecular weight and degree of polymerization using Ostwald's viscometer.
10. Knowledge in quantitative analysis of the acid/base.

4.Pre-requisite:

Introduction to chemistry lab

5. Link to other courses

Fundamental to B.Tech. Courses.

6.Course Content:

LIST OF EXPERIMENTS

7. Estimation of hardness of Water by EDTA.
8. Determination of DO in water (Winkler's Method).
9. Estimation of Chloride in Water sample (Argentometric).
10. Conductometric precipitation titration using BaCl_2 Vs Na_2SO_4

11. Determination of molecular weight and degree of polymerization using Ostwald viscometer
12. Conductometric titration (mixture of acids and base).

TOPICS BEYOND THE SYLLABUS

- 1..Determination of COD of the sample of water/sewage
- 2..Determination specific and equivalent conductance at infinite dilution of a given electrolyte

Course Code: U1GEB27

**Course Name: PRINCIPLES OF ELECTRICAL AND ELECTRONICS
ENGINEERING LAB**

L	T	P	C
0	0	3	2

**Designed for: Year: I Semester: I
Credits:2**

1.PREAMBLE:

This course teaches the implementations of few electrical wiring, measurement of few electrical quantities including Cathode ray operations, device characteristics & logic gates thus enabling every emerging engineer to understand basic principle of electrical & electronics irrespective of their branch.

2.COURSE EDUCATIONAL OBJECTIVES:

- To make students familiar about the various wiring methods and specific wiring like godown wiring
- To make students familiar about practical measurements of few important electrical quantities
- To make students understand about basic electronic circuit components and their characteristics study
- To make students understand about the operation of CRO
- To make students understand about the various logic gates.

3. COURSE OUTCOMES :

After successful completion of this course, students will be able to

- Reenact various wiring methods and how to make wiring of a godown.
- Understand what a resistive load is, and will be able to measure few electrical quantities like voltage, current and apply the skill in real life situations.
- Discriminate & recognize basic electronic circuit components and their characteristics study
- Check the operation of CRO
- Distinguish the various logic gates.

4.PRE-REQUISITES:

- Basic Electrical & Electronics concept covered in higher secondary level.

5.LINK TO OTHER COURSES:

Various laboratory courses based upon electrical & electronics concept of circuit branches and laboratory courses based upon electrical machines and digital electronics concept of non circuit branches

6. COURSE CONTENT

LIST OF EXPERIMENTS:

CYCLE I

11. Study of basic electrical and electronic components.
12. Godown Wiring
13. Stair case wiring
14. Fluorescent lamp wiring.
15. Measurement of Electrical quantities (Voltage, current, power) using load

MODEL PRACTICAL EXAMINATION I

CYCLE II

16. Characteristics of PN junction Diode.
17. Characteristics of BJT (any one configuration).
18. Characteristics of zener diode.
19. Study of CRO.
20. Verification of logic gates

MODEL PRACTICAL EXAMINATION II

LABORATORY REQUIREMENT FOR A BATCH OF 30 STUDENTS

HARDWARE:

- 2 nos. of incandescent lamp, 230V, 100W/40W.
- 2 nos. of florescent lamp 4ft(fixture),40 Watt.
- 2 nos of lamp holder, Pendent type
- 4 nos. of SPDT switch 230V, 5 Amp.
- 2 nos. moving iron (MI) (0-10)A ammeter & (0-300)V voltmeter.
- 2 nos. wattcmeters 300V 10A, UPF.
- Few connecting silk wires.
- 2 nos. of LED
- 2 nos of RPS , (0-30) V.
- 1 no. resistance 680 Ω .
- 2 nos. DC voltmeter of (0-1),(0-15) V,volts no.
- 2 nos.DC ammeter of (0-100) μ A,(0-50) μ A
- 6 nos. bread boards,
- 2 P-N junction diode,IN 4001
- 2 nos . of BJT(BC 107)
- 2 nos. zener(IN 3828) diode
- 2 CRO's 30 MHz
- Few Connecting wires 1/18''
- 4 nos resistances of 1 K Ω .10K Ω .
- 2 nos of IC7408,7432,7404, 7402,7486,7410,
- 2 nos. function generator, 3 MHz.
- 2 nos. capacitors each ,1000 μ F.1 μ F.
- 1 no.1-Ph. 5 kW resistive load
- 1 no auto transformer .1-ph, (0-270)V
- 1 step down transformer 230V/(0-9)V
- 1 no.Choke, 40 W,230 Volt
- 1 no.Starter

SOFTWARE

Nil

Course code : U1GEB37

Course Name : ENGINEERING PRACTICE LABORATORY

Designed for : Year I Semester I

L	T	P	C
0	0	3	2

1. COURSE EDUCATIONAL OBJECTIVE:

To educate the students in

- Plumbing tools – house hold plumbing fittings and Carpentry process – Carpentry tools, types of joints.
- Types of welding & tools.
- Types of machining and operations, machine tools, cutting tools (Lathe, Drilling).
- Sheet metal – definition, working tools, operations - forming & bending.

2. COURSE OUTCOMES:

Students undergoing this course are able to

1. Produce simple joints using arc and gas welding processes.
2. Display skills to perform basic machining and sheet metal operations.
3. Display skills to work in a team environment.
4. Prepare simple plumbing line sketches and models for house hold pipe fittings.
5. Exhibit simple carpentry skills using power tools.

3. COURSE CONTENTS

I CIVIL ENGINEERING PRACTICE

Plumbing Works:

- a) Preparation of plumbing line sketches for
 - i. Water supply line
 - ii. Sewage works.
- b) Basic pipe connections using valves, taps, couplings, unions, reducers, elbows and in house hold fitting.

Carpentry using Power Tools:

- (a) Study of the joints in roofs, doors, windows and furniture.
- (b) Hands-on-exercise: Power sawing, Power Planning and making various joints.

II MECHANICAL ENGINEERING PRACTICE

Welding:

- (a) Arc welding practice – butt joints and lap joints.
- (b) Gas welding practice – butt joints and lap joints.

Basic Machining:

- (a) Simple Turning and Taper turning in lathe.
- (b) Drilling Practice.

Sheet Metal Work:

- (a) Forming & Bending:
- (b) Model making – Trays, funnels, etc.

BEYOND THE SYLLABUS (STUDY)

Six axis robot, Vertical honing machine, Centerless grinding machine,