SYLLABUS FOR
BE I-SEMESTER

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

ENGLISH LANGUAGE AND COMMUNICATION-I
(Common to all branches of Engineering)
SYLLABUS FOR BE I SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19HS110EH
2 : 0 : 0	02	40	1 hour 30 Min	60	3 hours	

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to:	**At the end of the course the learners will be able to:-**
1. Understand the role and importance of communications skills 2. Realise the various features and functions of human language and communication, verbal and non-verbal. 3. Comprehend the use of words in different contexts. 4. Develop the habit of listening effectively to various speakers and lectures 5. Develop reading strategies in order to understand various types of texts.	1. Greet and converse with friends, teachers, and strangers appropriately 2. Listen and respond to lectures, talks and take notes 3. Use language functionally and participate in classroom interactions and in simulated situations replicating the real world. 4. Read, comprehend, and answer different types of texts and make notes. 5. Construct grammatically correct sentences accurately for speaking and writing.

UNIT-I

1.0 Effective communication

1.1 Role and **Importance** of language and Communication; **Functions** of communication; **Process** of Communication; **Types** of communication - formal and informal; verbal and non verbal; **Styles** of Communication; **Channels** of communication; **Barriers** to effective communication.

UNIT-II

2.0 Listening and Speaking skills

2.1 Importance of **listening** in effective communication; **Active listening**

2.2 Speaking skills:-Speaking strategies, Functions of oral communication-introducing a person and speaking about his/her achievements, **situational dialogues**; **telephone etiquette; poster-presentations.**

UNIT-III

3.0 Reading and Writing skills

3.1 Sub-skills of **Reading**; Understanding the functions of different texts, Reading Comprehension

3.2 Written Communication: **Styles**

- Describing events, people, places, objects
- Defining
- Providing examples or evidence
- Writing introduction and conclusion

3.2.1 Written Communication: **Features of Writing**:-

Importance of proper **punctuation**, Creating **coherence**, Organizing principles of paragraphs in documents, Techniques for writing precisely using appropriate **phrases** and **clauses** and **linkers**.

UNIT-IV

4.0 Vocabulary Building and Grammar

4.1 Vocabulary Building: The concept of **Word Formation**; **Root** words. **Prefixes and suffixes**; Synonyms, antonyms, and standard abbreviations. Homonyms, Homophones.

4.2 Remedial English: Articles, Prepositions; Tense and Aspect; Subject- Verb agreement; Connectives; Direct and Indirect Speech,; Common errors

UNIT-V

5.0 Reading skills and Comprehension

5.1 Prose text- In love with Rocket Science- India's Missile Woman

5.2 A *Psalm of Life*. By Henry Wadsworth *Longfellow*.

Prescribed textbook for theory:

Technical communication - Principles and Practice (2nd Edition 2014) - Meenakshi Raman and Sangeeta Sharma- Oxford University Press.

Learning Resources:

1. E.Suresh kumar, P. Sreehari and J. Savithri - Essential English
2. Reading comprehension - Nuttal.J.C - Orient Blackswan
3. Sunitha Mishra,C. Murali Krishna, Communication Skills for Engineers, Pearson, 2004.
4. M. Ashraf Rizvi. Effective Technical Communication. Tata Mcgraw Hill, 2005.
5. Allen and Waters., How English Works.
6. Willis Jane., English through English.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

ENGINEERING MATHEMATICS - I
(Common to all branches of Engineering)
SYLLABUS FOR BE I SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19BS110MA
3 : 0 : 0	03	40	1 hour 30 Min	60	3 hours	

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the students to:	***At the end of the course students should be able to:***
1. **Understand** the Mean value theorems, concepts of curvature, radius of curvature evolutes and envelopes and to expand functions using Taylor's series. 2. **Acquire** knowledge of partial derivatives, and expand functions using Taylor's series functions of two real variables and, maxima-minima. 3. **Study** the concepts of vector differentiation, Gradient, Divergence and Curl. 4. **Learn** how to evaluate double and triple integrals, Change of order of integration and change of variables and vector integration and its applications.. 5. **Understand** infinite series, nature and various tests to check the nature of infinite series .	1. **Compute** radius of curvature, evolute and envelope of a given curve and also to expand given function using Taylor's series. 2. **Expand** the given function in terms of Taylor's series and find Maxima and minima of functions of several variables also using Lagrange's method of multipliers. 3. **Calculate** the gradient and directional derivatives and Curl. 4. **Apply** the given double and triple integrals to evaluate area and volume and to use Green's theorem to evaluate line integrals, Stokes' theorem to give a physical interpretation of the curl of a vector field and the divergence theorem. 5. **Identify** the given series and apply an appropriate test to check its nature

UNIT – I (10 Hours)
Differential Calculus
Introduction to Mean Value Theorems with Geometrical Interpretation(Without Proofs) - Taylor's Series – Expansion of functions in power series- Curvature- Radius of Curvature (Cartesian and Parametric co-ordinates) – Centre of Curvature – Evolutes – Envelopes of one parameter family of curves.

UNIT – II (12 Hours)
Multivariable Calculus
Limits- Continuity -Partial Derivatives-Higher Order Partial Derivatives-Total Derivates - Derivatives of Composite and implicit functions - Taylor's series of functions of two variables - Maxima and Minima of functions of two variables with and without constraints - Lagrange's Method of multipliers.

UNIT – III (8 Hours)
Vector Differential Calculus
Scalar and Vector point functions -Vector Differentiation-Level Surfaces-Gradient of a scalar point function- Normal to a level surface- Directional Derivative – Divergence and Curl of a Vector field-Conservative vector field.

UNIT – IV (12 Hours)
Vector Integral Calculus

Multiple integrals: Double and Triple integrals (Cartesian) - Change of order of integration(Cartesian Coordinates).

Vector Integration: Line, Surface and Volume integrals- Green's Theorem – Gauss Divergence theorem - Stokes's Theorem. (all theorems without proof).

UNIT – V (10 Hours)
Infinite Series

Sequences- Series – Convergence and Divergence- Series of positive terms- Geometric series- p-series test - Comparison tests - D'Alemberts Ratio Test – Cauchy's root test - Alternating Series – Leibnitz test – Absolute and Conditional convergence.

Learning Resources:

1. Advanced Engineering Mathematics, Third Edition, R. K. Jain and S. R. K. Iyengar, Narosa Publishing House.
2. Higher Engineering Mathematics, B. S. Grewal 40th. Edition, Khanna Publishers.
3. Advanced Engineering Mathematics 8th Edition by Erwin Kreyszig , John Wiley & Sons.
4. Differential Calculus by Shanti Narayan S. Chand & Co
5. Vector Calculus – Schaum's outline series.
6. http://mathworld.wolfram.com/topics
7. http://www.nptel.ac.in/course.php

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

APPLIED CHEMISTRY

(Common to all branches of Engineering)
SYLLABUS FOR BE I SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19BS020CH
3 : 1 : 0	04	40	1 hour 30 Min	60	3 hours	

LEARNING OUTCOMES
At the end of the course students should be able to:
1. Construct a galvanic cell and calculate its EMF and pH wherever applicable. 2. Describe the construction, functioning and applications of the selected primary, secondary batteries and fuel cells. 3. Catagorise the polymers and discuss the synthesis of a few polymers and their applications. 4. Rate the fuels and suggest methods for enhancement of the quality of fuels for the required output and explain the methods of preparation and applications of high energy materials namely Lead azide, TNT, Nitro glycerine and RDX. 5. Suggest appropriate treatment methods of water to make it fit for domestic and industrial applications and apply the principle of phase rule to heterogeneous equilibria.

UNIT-I
ELECTROCHEMISTRY (11)

Introduction, conductance, types of conductance- specific, equivalent, molar conductance and their interrelationship- numericals. Ionic mobility and transport number- definition, determination by Hittorfs method (Non attackable electrodes) numericals. Principle and applications of conductometric titrations- strong acid *vs* strong base, week acid *vs* strong base and mixture of acids *vs* strong base.

Cells- electrolytic and electrochemical cells. IUPAC convention of cell notation, cell reaction, concept of electrode potential, electro motive force (EMF). Electrochemical series – applications, Nernst equation-derivation, applications and numericals. Types of electrodes- construction and working of calomel electrode (CE), quinhydrone electrode and glass electrode (GE). Determination of pH using glass electrode and quinhydrone electrode. Applications of potentiometry- acid base and redox titration (Fe(II) Vs $KMnO_4$).

UNIT-II
BATTERY TECHNOLOGY (9)

Introduction- definition of cell and battery – Types of cells (reversible and irreversible cells). Battery characteristics: free energy change, electromotive force of battery, power density, energy density- numericals.
Primary, secondary and fuel cells.
Primary batteries: Construction and electrochemistry of Ag_2O-Zn battery and lithium-V_2O_5 battery.
Secondary batteries: Construction and working of lead-acid, Ni-Cd and lithium ion battery – advantages, limitations and applications.

Fuel cells: Concept, types of fuel cells and merits. Construction, working and applications of methanol-oxygen and phosphoric acid fuel cell.

UNIT-III

POLYMER CHEMISTRY (11)

Introduction, degree of polymerization, functionality of monomers and its effect on the structure of polymers. Classification of polymers-a) homo and co-polymers b) homo chain and hetero chain polymers. c) plastics, elastomers, fibers and resins.
Types of Polymerization - Addition and condensation polymerization.
Glass transition temperature (Tg), factors affecting Tg.
Molecular weight- number average and weight average molecular weight, numericals.
Plastics: Thermo plastics and thermosets - preparation, properties and applications of a) Aramid (Kevlar) b) Phenol-formaldehyde (Bakelite) c) PVC
Elastomers: Natural rubber- structure – chemistry of vulcanization and advantages.
Artificial rubbers: Preparation, properties and uses of Buna-S and silicone rubbers.
Biodegradable polymers: Concept, preparation and uses of ploy lactic acid.
Conducting polymers: Definition- classification, mechanism of conduction in polyacetylene and applications.

UNIT-IV

CHEMICAL FUELS AND HIGH ENERGY MATERIALS (10)

Fuels: Introduction, classification, requisites of a good fuel. Calorific value (CV)-HCV and LCV. Calculation of CV using Dulong's formula, numericals. Chemistry of combustion - numericals on volume- weight and weight-weight methods.
Solid Fuels: Coal: Proximate and ultimate analysis of coal and their significance.
Liquid Fuels: Fractions of crude oil, composition and CV of gasoline, cracking: Fixed bed catalytic cracking method. Knocking and its significance, octane number, enhancement of quality of gasoline by reforming and anti- knock agents. Leaded and unleaded petrol, power alcohol. Catalytic converters and their role in reducing the toxicity of automobile exhaust emissions. Composition and CV of diesel oil, cetane number.
Bio-diesel: Source, chemistry of transesterification, advantages of bio diesel.
Rocket Propellants- Principle of rocket propulsion, classification, characteristics of good propellants.
High energy materials- Introduction, classification, precautions during storage, characteristics of explosives (oxygen balance-numericals) preparation of lead azide, TNT, Nitro glycerine and RDX.

UNIT-V

WATER TECHNOLOGY AND PHASE RULE (9)

Hardness of water- types. Calculation of degree of hardness of water-numericals. Determination of hardness of water by EDTA method -numericals. Alkalinity of water and its determination-Numericals. Boiler troubles- scales andsludges formation and prevention-Calgonconditioning. Desalination of water by Reverse Osmosis. Specifications of potable water. Water treatment for drinking purpose sterilization by chlorination- concept of Break Point Chlorination.
Phase rule- explanation of terms involved, one component system: Water system, condensed phase rule, two component systems: Lead- Silver (Pb-Ag) system, Pattinson's process, Eutectics and their applications in safety fuses and solders.

Learning Resources:

1. PC Jain, M Jain Engineering Chemistry, Dhanapathi Rai and sons (16th edition), New Delhi.
2. Sashi Chawla, Text book of Engineering Chemistry, Dhanapathi Rai &sons, New Delhi.
3. O.G. PALANNA, Engineering Chemistry, TMH Edition.
4. Wiley Engineering chemistry, Wiley India pvt Ltd, II edition.
5. Chemistry in engineering and technology by J.C. Kuriacose and Rajaram.
6. University chemistry, by B. H. Mahan
7. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. Krishnan
8. Physical Chemistry, by P. W. Atkins
9. S.S. Dara, S Chand and sons, Engineering Chemistry, New Delhi.
10. Puri, Sharma and Pathania Principles of physical chemistry, Vishal Publishing Co.
11. NPTEL Polymer Chemistry Course, D. Dhara, IIT Kharagpur.
12. Polymer chemistry by Gowariker

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

BASIC ENGINEERING MECHANICS

(Common to Civil, Mechanical & EEE – I SEMESTER)

SYLLABUS

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19ES010CE
3 : 0 : 0	03	40	1 hour 30 Min	60	3 hours	

COURSE OBJECTIVES	**COURSE OUTCOMES**
Objectives of this course are to:	*At the end of the course, students will be able to:*
1. Explain the resolution of a system of forces (coplanar, spatial, concurrent, non-concurrent) and compute their resultant. 2. Solve particle equilibrium problem using equation of equilibrium 3. Determine forces in the members of a truss 4. Perform analysis of bodies lying on rough surfaces. 5. Locate the centroid of a body and also compute the area moment of inertia of standard and composite sections.	1. Determine resultant of forces acting on a body. 2. Analyse equilibrium of a body subjected to a system of forces. 3. Perform analysis of trusses using method of joints and method of sections. 4. Solve problem of bodies subjected to friction. 5. Find the location of centroid and calculate moment of inertia and polar moment of inertia of a given section.

UNIT-I

Force Systems: Rectangular components, moment, couple and resultant of two dimensional and three dimensional force systems.

UNIT-II

Equilibrium of Force Systems: Free body diagram, Equations of equilibrium, Equilibrium of planar and spatial system.

UNIT-III

Determinate Trusses: Analysis of plane trusses like warren girder, Pratt truss, fink truss etc using method of joints and method of sections.

UNIT-IV

Friction: Laws of friction. Application to simple systems, Connected systems and belt friction, Wedge friction.

UNIT-V

Centroid and Moment of Inertia: Centroids of lines, areas and volumes, Moment of inertia of areas, Composite areas, Polar moment of inertia, Radius of gyration.

Learning Resources:

1. Singer F.L "Engineering Mechanics", Harper & Collins, Singapore, 3rd Edition 2011.
2. Timoshenko S.P and Young D.H *"Engineering Mechanics",* McGraw Hill International Edition, 2017
3. Andrew Pytel., Jaan Kiusalaas., *"Engineering Mechanics",* Cengage Learning, 2014.
4. Beer F.P & Johnston E.R Jr. Vector *"Mechanics for Engineers"*, TMH, 2004.
5. Hibbeler R.C & Ashok Gupta*, "Engineering Mechanics",* Pearson Education, 2010.
6. Tayal A.K., *"Engineering Mechanics – Statics & Dynamics"*, Umesh Publications, 2011.
7. Basudeb Bhattacharyya., *"Engineering Mechanics",* Oxford University Press, 2008.
8. Meriam. J. L., *"Engineering Mechanics",* Volume-I Statics, John Wiley & Sons, 2008.
9. NPTEL Course (www.nptel.ac.in)
10. Virtual labs (www.vlab.co.in)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

ENGINEERING GRAPHICS-I

(Common to Civil, Mechanical & Electrical Engineering)
SYLLABUS FOR I-SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19ES120CE
1 : 0 : 2	02	40	1 hour 30 Min	60	3 hours	

COURSE OBJECTIVES	**COURSE OUTCOMES**
Objectives of this course are to:	*At the end of the course, students will be able to:*
1. Impart skills of drawing instruments and their use to convey exact and complete information of any object. 2. Explore various scales in Engineering practice 3. Construct engineering curves. 4. Prepare orthographic projections of points, lines, planes and solids	1. Identify the qualities of precision and accuracy. 2. Convey technical information effectively through sketches / drawings. 3. Construct engineering curves with different methods. 4. Develop the conics using different methods, hypocycloidal and involutes. 5. Draw the orthographic projection of points, lines, planes and solids.

UNIT-I

Introduction: Instruments and their uses, lettering, types of lines and dimensioning methods.

Scales: Reduced and Enlarged scales, Representative fraction, Scales: plain, diagonal only.

Regular Polygons: Polygons given the length of side only.

UNIT-II

Engineering curves: Ellipse, Parabola and Hyperbola (Eccentricity method only), Cycloid, Epicycloid, Hypocycloid and Involute.

UNIT-III

Projection of points and straight lines: Orthographic projection, Projection of points placed in different quadrants, Projection of straight lines inclined to one and two reference planes placed in first quadrant only, Traces.

UNIT-IV

Projections of planes: Projection of perpendicular planes, Oblique planes and Traces of planes.

UNIT-V

Projection of solids: Polyhedra, Solids of revolution, Projections of solids in simple position (prisms, pyramids, cylinders and cones), axis inclined to one plane, Axis inclined to both the reference planes, Projection of solids using auxiliary plane method.

Learning Resources:

1. Bhatt N.D. "Elementary Engineering Drawing", Charotar Publishers, 2014.
2. Thomas E French, Charles J Vierck, Robert J. Foster, "Engineering Drawing and Graphic Technology", McGraw Hill Education, 2012.
3. Gill P.S. "Engineering Drawing: Geometrical Drawing", SK Kataria & sons, 2012.
4. Venugopal.K "Engineering Drawing and Graphics Plus Autocad", New Age International (P) Ltd., New Delhi, 2010.
5. Siddiquee A.N "Engineering Drawing with a Primer on Autocad", Prentice hall of India Ltd., New Delhi, 2004.
6. Basanth Agrawal, Agrawal C.M "Engineering Graphics" First Edition, Tata McGraw Hill, 2012
7. BVR Gupta, M Raja Roy, "Engineering Drawing with AutoCad", IK Int Pvt Ltd, 2009
8. NPTEL Course (www.nptel.ac.in)
9. Virtual labs (www.vlab.co.in)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

INTRODUCTION TO PROGRAMMING
(Common to Civil & Mechanical Engineering)
SYLLABUS FOR BE I SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19ES110CS
1 : 0 : 0	01	30	1 hour 30 Min	40	2 hours	

COURSE OBJECTIVES	**COURSE OUTCOMES**
Students should be able to	At the end of the course, students will be able to
1. Identify components of the computer, and operating environments. 2. Understand the steps in problem solving and formulation of flowcharts to problems. 3. Understand the operators in C Programming language.	1. Demonstrate the basic knowledge of computer hard ware and soft ware. 2. Formulate solutions to problems and represent them using Flowcharts. 3. Develop and evaluate the expressions using operators. 4. Develop programs using control statements.

UNIT –I:

Introduction to Computers and Problem Solving: Components of a Computer, Operating system, Compilers, Computer Languages, Program Development Environments, Creating and Running programs, Algorithm, Flowchart. Number Systems: Binary, Decimal, Octal, Hexadecimal and Conversions.

UNIT – II:

Introduction to C: Introduction, Structure of C program, keywords, identifiers, Types, Variables, constants, Operators, Expressions, Precedence and Associativity, Type Conversion, Expression Evaluation.

Conditional Control Statements: Simple if, if-else, else if ladder, nested if and switch-case.

Introduction to Loop statements.

Learning Resources:

1. Yashavanth Kanetkar, "Let us C", 16th Edition, BPB Publications, 2018.
2. Balagurusamy E, Programming in ANSI C, 7th Edition, TMG, 2016.
3. ReemaTharaja "Introduction to C Programming", Second Edition, OXFORD Press, 2018.
4. J.R. Hanly and E.B. Koffman "Problem Solving and Program Design in C" , 7th Edition, Pearson Education, 2012.
5. PradeepDey and Manas Ghosh, "Programming in C", Oxford Press, 2nd Edition, 2017.
6. https://www.tutorialspoint.com/cprogramming/index.htm
7. https://onlinecourses.nptel.ac.in/noc18-cs10/preview

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB-I
(Common to all branches of Engineering)
SYLLABUS FOR BE I SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19HS111EH
0 : 0 : 2	01	30	-	50	3 hours	

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the learners to:	**At the end of the course the learners will be able:**
1. Identify and describe phonemes in English. 2. learn the speech sounds and distinguish between vowel and consonant sounds in the English language 3. reduce mother tongue influence when speaking English. 4. understand and follow the rules in debates, group discussions, interviews and role plays 5. develop reading skills and analyse various text types. 6. use dictionary for pronunciation and transcription of words	1. use language with appropriate pronunciation. 2. modify language based on the context and situations.(formal and informal) 3. participate effectively in group discussions and debates. 4. enact role plays. 5. use language coherently. 6. comprehend various text types.

1.0 PHONETICS LAB- TOPICS

1.1 Introduction to English Phonetics: Introductory to auditory, acoustic and articulatory phonetics. Organs of speech: the respiratory, articulatory and phonatory systems.
1.2 Sound System of English: Phonetic sounds, Introduction to International Phonetic Alphabet; The Syllable: Types of syllables ,Transcription.

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS
2.1 Group discussion: Objectives of GD, Types of GDs; Initiating, Continuing, and concluding a GD. (Basic Level)

2.2 Debate: understanding the difference between a debate and a group discussion, essentials of debate, concluding a debate. (Basic Level)

2.3 Role Plays: - Use of structured and semi-structured dialogues in a variety of situations and settings.

2.4 Interview Skills - Basic HR questions.
Viva questions will be asked in internal and external exams.

3.0 READING SKILLS LAB - TOPICS
3.1 Teaching different types of texts for comprehension

Viva questions will be asked in internal and external exams.

Prescribed textbook for lab:

Speak Well : Jayshree Mohanraj, Kandula Nirupa Rani and Indira Babbellapati - Orient BlackSwan

Learning Resources:

1. T.Balasubramanian: A textbook of English phonetics for Indian students, Macmillan, 2008.
2. Priyadarshi Patnaik : Group discussion and interviews, Cambridge University Press India private limited 2011.
3. Daniel Jones: Cambridge English Pronouncing Dictionary - A Definitive guide to contemporary English Pronunciation.
4. Reading Cards (Eng400): Orient Blackswan. Reading Squabble - Hadfield.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

CHEMISTRY LAB

(Common to all branches of Engineering)
SYLLABUS FOR BE - I SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19BS011CH
0 : 0 : 2	01	30	-	50	3 hours	

LEARNING OUTCOMES:
At the end of the course, students should be able to:
1. Determine the amount of metals in the given solutions.
1. Analyse the hardness, alkalinity and chloride content of a given water sample.
2. Estimate the amount of a substance in a given solution by conductometry, potentiometry and pH metry.
3. Use the principle of colorimetry in the estimation of Permanganate / Copper (II) in a given solution.
5. Synthesize a polymer.

1. Preparation of standard FAS or oxalic acid solution and standardization of $KMnO_4$ or NaOH solution.
2. Estimation of ferrous iron in the given solution by permanganometry.
3. Estimation of chromium in the given solution by standardized FAS.
4. Estimation of copper in brass or given solution by hypo.
5. Estimation of available chlorine in bleaching powder.
6. Estimation of total hardness of given water sample.
7. Estimation of alkalinity of a given sample.
8. Conductometric acid-base titrations -Determination of strength of given acids (HCl *Vs* NaOH and CH_3COOH *Vs* NaOH).
9. Conductometric acid-base titrations- Determination of strength of acids in a given mixture of acids (HCl and CH_3COOH *Vs* NaOH)
10. Determination of strength of a given acid by Potentiometry.
11. Determination of concentration of a given $FeSO_4$ using redox titration by Potentiometry.
12. Determination of strength of a given acid by pH metre.
13. Determination of strength of permanganate or copper in brass solution by Colorimetry.
14. Determination of concentration of a salt by ion exchange method.
15. Synthesis of Aspirin or Phenol formaldehyde resin.

Learning Resources:

1. G H Jeffery, J Bassett, J Mendham, R C Denney, Vogel's text book of quantitative chemical analysis, Fifth Edition.
2. M S Kaurav, Engineering chemistry with laboratory experiments, PHI learning (P) ltd, New Delhi.
3. Sunita rattan, Experimenta in applied chemistry, S K Kataria & Sons (2010)
4. A text book on experiments and calculation Engg. S.S. Dara.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

SYLLABUS FOR B.E.–I SEMESTER
Engineering Workshop -I
(for Mechanical, Civil & EEE)

Instruction: 2 Hrs /week	SEE Marks :50	Course Code :U19ES111ME
Credits : 1	CIE Marks: 30	Duration of SEE : 3 Hrs

Course Objectives	Course Outcomes
The course will enable the students to: 1. know basic workshop processes, adopt safety practices while working with various tools 2. identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.	At the end of the course, students will be able to: 1. create models in Carpentry, plumbing, Electrical & Electronics and Sheet metal trades by using the relevant tools. 2. measure and Inspect the finished components using suitable measuring instruments. 3. apply basic electrical and electronics engineering knowledge to make simple electrical circuits and check their functionality along with practice in

List of Exercises

Plumbing (6 hrs.)
1. Introduction of tools, joints, couplings and valves etc.
2. Pipe thread cutting and making single joint with coupling and tap connection.
3. Water shower connection with reducer coupling
4. Geyser connection(demo)

Electrical & Electronics (6 hrs.)
1. Two lamps in(a)series(b) parallel with 3 pin plug and switches
2. Staircase wiring and Tube light wiring
3. (a) Identification of electronic components
   (b) Soldering practice
4. LT Distribution with loads (Demo)

Carpentry (6 hrs.)
1. Half-lap joint
2. Dove-tail joint
3. Bridle joint
4. Wood turning operation (demo)

Sheet Metal (6 hrs.)
1. Rectangular Box
2. Rectangular scoop with handle
3. Making a Funnel with soldering
4. Making a T-Joint (Demo).

Plastic Moulding (2 hrs.)
1. Injection moulding of plastic spoon (demo)

Learning Resources:

1. Hajra Choudhury S.K., Hajra Choudhury A.K., Nirjar Roy S.K. "Elements of Workshop Technology" Vol-I 2008 & Vol-II 2010 Media Promoters & Publishers Pvt. Limited, Mumbai.
2. Kalpakjian S. and Steven S. Schmid, "Manufacturing Engineering and Technology" 4th Edition, Pearson Education India Edition, 2002.
3. Gowri P., Hariharan and Suresh Babu A., "Manufacturing Technology-I", Pearson Education 2008.
4. P. Kannaiah & K. L. Narayana "Workshop manual" 2nd Ed., Scitech publications (I) Pvt. Ltd., Hyderabad.
5. B.L. Juneja, "Workshop Practice", Cengage Learning India Pvt. Limited, 2014.

Web Resources:

www.technologystudent.com

SYLLABUS FOR
BE II-SEMESTER

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

ENGLISH LANGUAGE AND COMMUNICATION-II
(Common to all branches of Engineering)
SYLLABUS FOR BE II SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19HS210EH
2 : 0 : 0	02	40	1 hour 30 Min	60	3 hours	

COURSE OBJECTIVES	COURSE OUTCOMES
To enable the students to	**At the end of the course the learners will be able to**
1. Participate confidently in discussions both in the classroom and outside. 2. Work in teams, share ideas, agree and disagree politely. 3. Communicate in interpersonal and intrapersonal contexts. 4. Read and write letters independently. 5. Write sustained piece of texts exhibiting qualities of coherence and cohesion.	1. Identify words for use both in informal and formal contexts, to persuade and instruct and to inform. 2. Adapt and cooperate with people in varied contexts to function effectively, individually and in teams. 3. Compose coherent letters, essays and resumes for varied situations. 4. Interpret and write a piece of text with coherence and cohesion. 5. Write paragraphs on any given topic following the rules of grammar and use appropriate vocabulary

UNIT-I

1.0 Interpersonal Communication

1.1 Johari Window
1.2 Team building skills and team work
1.3 Persuasion techniques

UNIT-II 2.0 Speaking skills

2.1 Speaking strategies:- Making Power Point Presentations (research oriented topics)

UNIT-III

3.0 Writing Practices

3.1 Précis Writing
3.2 Essay Writing-General and Creative
3.3 Email-etiquette
3.4 Request letters
3.5 Application letters and resume

UNIT-IV

4.0 Advanced Remedial English and Vocabulary:- (In context)

4.1 Grammar-Active and Passive Voice; Subject-Verb agreement

4.2 Vocabulary:- Words often confused, One-word substitutes; Collocations, phrasal verbs; Idiomatic usage.

UNIT-V

5.0 Reading skills and Comprehension

5.1 Getting acquainted with major type of questions

5.2 Prose text- Shiva Ayyadurai- The Inventor of the e-mail.

5.3 Poem by William Wordsworth - The World Is Too Much With Us

Prescribed textbook for theory:

Technical communication - Principles and Practice (2nd Edition 2014) - Meenakshi Raman and Sangeeta Sharma- Oxford University Press.

Learning Resources:

1. Essential English - E.Suresh Kumar, P. Sreehari, J. Savithri - Orient Blackswan 2011.
2. Sunitha Mishra., C. Murali Krishna., Communication Skills for Engineers, Pearson, 2004.
3. Practical English Usage. Michael Swan. OUP. 1995.
4. Remedial English Grammar. F.T. Wood. Macmillan.2007
5. On Writing Well. William Zinsser. Harper Resource Book. 2001
6. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
7. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011. (vi) Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

ENGINEERING MATHEMATICS-II
(Common to all branches of Engineering)
SYLLABUS FOR BE II SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19BS210MA
3 : 0 : 0	03	40	1 hour 30 Min	60	3 hours	

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the students to :	***At the end of the course students should be able to:***
1. **Study** the concepts of matrices, Eigen values and Eigen vectors, Diagonalization and canonical form of a quadratic form. 2. **Solve** various first order differential equations using various elementary techniques and learn its applications. 3. **Solve** various Higher order homogeneous and non-homogeneous differential equations with constant and variable coefficients and applications. 4. **Understand** the Analytic functions, conditions and harmonic functions. 5. **Evaluate** a line integral of a function of a complex variable using Cauchy's integral formula, and how to evaluate Taylor's and Laurent Series.	1. **Find** the rank of a given matrix, diagonalizable a given matrix and reduce a quadratic form to canonical form and find its nature. 2. **Identify** the differential equations and solve them, model the real time electrical engineering problems viz., RC Circuits into differential equations and solve. 3. **Solve** various higher order Linear Differential Equations, model the real time electrical engineering problems viz., LC and LCR circuits into differential equations and solve them by using the various applicable techniques learnt. 4. **Apply** the condition(s) for a complex variable function to be analytic and/or harmonic and to construct an Analytic function. 5. **Apply** Cauchy's theorem and Cauchy's Integral formula to evaluate complex integrals and define singularities of a function and to expand a given function as a Taylor's / Laurent's series.

UNIT – I (12 classes)

Matrices

Rank of a Matrix- Linearly independence and dependence of Vectors - Characteristic equation- -Eigen values and Eigenvectors - Physical Significance of Eigen values - Cayley - Hamilton Theorem (without proof)- Diagonalization using Similarity Transformation.

UNIT – II (10 classes)

Ordinary Differential Equations of first order

Exact first order differential equations - Integrating factors- Linear first order equations – Clairaut's equation -

Applications of First Order Differential Equations -Orthogonal trajectories (Cartesian families) – LR and RC Circuits.

UNIT – III (10 classes)

Linear Differential equations

Solutions of Homogeneous and Non Homogeneous equations with constant coefficients- Method of Variation of Parameters –Applications of linear differential equations to LCR circuits

UNIT – IV (10 classes)

Complex Variables (Differentiation)

Limits and Continuity of function - Differentiability and Analyticity - Necessary & Sufficient Condition for a Function to be Analytic - Milne-Thompson's method - Harmonic Functions.

UNIT – V (10 classes)

Complex Integration

Complex Integration- Cauchy's Theorem - Extension of Cauchy's Theorem for multiply connected regions- Cauchy's Integral Formula - Power series - Taylor's Series - Laurent's Series (without proofs) –Poles and Residues.

Learning Resources:

1. Advanced Engineering Mathematics 3rd Edition, R.K.Jain & S.R.K.Iyengar, Narosa Publishing House.
2. Higher Engineering Mathematics 40th Edition Dr. B.S Grewal, Khanna Publishers.
1. A Text book of Engineering Mathematics, N.P.Bali & Manish Goyal, Laxmi Publications.
2. Advanced Engineering Mathematics, by Wylie & Barrett, Tata Mc Graw Hill, New Delhi.
3. Advanced Engineering Mathematics, 8th Edition by Erwin Kreyszig , John Wiley & Sons, Inc.
4. Complex Variables and applications, J.W.Brown and R.V.Churchill, 7th Edition, Tata Mc Graw Hill,2004.
5. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
6. http://mathworld.wolfram.com/topics
7. http://www.nptel.ac.in/course.php

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

APPLIED PHYSICS

(Common to all Civil and Mechanical Engineering)
SYLLABUS FOR BE II SEMESTER

L : T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	
3 : 1 : 0	04	40	1 hour 30 min	60	03 hours	U19BS020PH

Course Objectives	Course Outcomes
The student will be able to	***At the end of the course, the student should at least be able:***
1. learn mathematical formulations of waves and oscillations 2. Acquire knowledge of on various optical phenomenon like interference, diffraction etc. 3. gain insight on lasing action and lasers 4. grasp the concepts of acoustics 5. learn liquefaction of gasses	1. solve differential equations that describe the behavior of mechanical oscillators under various conditions 2. apply the fundamental principles of wave optics in relevant fields of engineering. 3. List various types of lasers and their applications 4. apply the principles of acoustics to minimize the reverberation and echo effects. 5. appreciate liquefaction of air & He and applications of low temperatures and their importance.

UNIT-I:

OSCILLATIONS (8 hours)

Definition of SHM, equation of motion and it solution to simple harmonic oscillator, time period of compound pendulum, energy of simple harmonic oscillator, equation of motion and it solution to damped harmonic oscillator, logarithmic decrement, energy of damped oscillator, relaxation time, equation of motion and it solution to forced harmonic oscillator, Resonance, Q-factor, sharpness, electromechanical analogy, Lissajous figures.

UNIT-II:

WAVE OPTICS (12 hours)

Interference: Light as an electromagnetic wave, superposition theorem, interference of light by wave front splitting and amplitude splitting, interference due to thin parallel film, Newton's rings, and its applications, Michelson interferometer.

Diffraction: Fraunhofer diffraction due to a single slit- diffraction due to N- slits (plane transmission grating) -Rayleigh criterion for limit of resolution, resolving power, dispersive power.

Polarization: Polarization of light, Brewster law, Malus law, double refraction, construction and

working of Nicol's Prism. Polariser and analyser, Half shade Lorentz Polarimeter.

UNIT-III:

LASERS AND OPTICAL FIBRES (10 hours)

Lasers: induced absorption, spontaneous and stimulated emissions, Einstein's theory of matter radiation interaction- A and B coefficients; population inversion, meta-stable states, pumping mechanisms, components of laser, Properties of laser beams, construction and working of solid state lasers: Ruby laser and Nd: YAG, Gas lasers: He-Ne and CO_2 laser, advantages and applications of lasers.

Optical Fibers: Total internal reflection, numerical aperture, acceptance angle, propagation of light in optical fibre, types of optical fibers based on refractive index and modes of propagation etc, light sources for optical fibre communication, various signal losses in optical fibers, Block diagram of optical communication system, advantages and application of optical fibers.

UNIT-IV:

ACOUSTICS (10 hours)

Acoustics: Characteristics of sound-pitch, loudness, timbre, Weber-Fechner law: measurement of intensity of sound -reverberation-reverberation time-Sabine's formula-remedies to reverberation- sound absorbent materials-absorption coefficient- conditions for good acoustics of a building-acoustic quieting: effects and remedies

Ultrasonics : properties of ultrasonics, types of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics by piezoelectric, Kundt's tube, flame test, thermal detector, acoustic grating: ultrasonic velocity measurements, applications of ultrasonics: SONAR, cavitation (cleaning), drilling, sonogram

UNIT-IV:

LOW TEMPERATURE PHYSICS (10 hours)

Introduction to low temperature Physics- Porous plug experiment: Joule Thomson effect, Theory of porous plug experiment- J-K effect for a Van der Waal's gas, J-K effect for real gas, Inversion temperature, Boyle temperature, critical temperature and relationship between them. Regenerative cooling and cascade process, Liquefaction of air by Linde Process, liquefaction of hydrogen, Liquefaction of helium, Properties of cryogenic helium, adiabatic demagnetization, Applications of cryogenic liquids.

Learning Resources:

1. A. P. French, Vibration's and Waves, CRC Press, 2003
2. Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens and James V. Sanders Fundamentals of Acoustics 4th Edition, John Wily, 2009.
3. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun Murthy A Text Book Engineering Physics, 11th Edition, S. Chand, 2018.
4. Senior, Optical Fiber Communications: Principles and Practice, 3e: Pearson, 2010
5. Charles Kittel, Introduction to Solid State Physics, 7th Edition, John Wiley & Sons, 2008.
6. Zeemansky, Heat and thermodynamics, Mc Graw Hill, 7th Edition, 1981
7. B.K. Pandey and Chaturvedi, Engineering Physics, Cengage Learning, 2016
8. V. Rajendran, Engineering Physics, Mc Graw-Hill Education, 2014

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

ENGINEERING GRAPHICS-II
(Common to Civil, Mechanical & Electrical Engineering)
SYLLABUS FOR II-SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	
1 : 0 : 2	02	40	1 hour 30 Min	60	3 hours	U19ES220CE

Course Objectives	**Course Outcomes**
Objectives of this course are to:	*At the end of the course, students will be able to:*
1. Explain the principles involved in Section of simple solids 2. Develop surfaces of simple solids 3. Explain intersection of cylinder with cylinder and cylinder with cone 4. Differentiate between isometric view and isometric projection 5. Draw orthographic views from pictorial views	1. Draw sectional views of simple solids 2. Develop the lateral surfaces of simple solids 3. Prepare orthographic views of intersection of solids. 4. Visualize isometric view of simple planes, solids and combined solids 5. Construct orthographic views of simple objects from their pictorial views

UNIT-I
Sections of Solids: True shape of sections, sections of prisms, pyramids, cylinders and cones.

UNIT – II
Development of Surfaces: Basic concepts of development of surfaces, Methods of development – Parallel line development and radial line development, Development of prisms, pyramids, Cylinders and cones.

UNIT-III
Intersection of Surfaces: Intersection of cylinder and cylinder, cylinder and cone.

UNIT –IV
Isometric Projections: Isometric scale, Isometric projections of prisms, pyramids, cylinders, cones, spheres, and combinations of two or three solids.

UNIT-V
Conversion of Isometric Views to Ortho-graphic views: Drawing orthographic

views from Isometric views for simple objects.

Learning Resources:

1. Bhatt N.D. "Elementary Engineering Drawing", Charotar Publishers, 2014.
2. Thomas E French, Charles J Vierck, Robert J. Foster, "Engineering Drawing and Graphic Technology", McGraw Hill Education, 2012.
3. Gill P.S. "Engineering Drawing: Geometrical Drawing", SK Kataria & sons, 2012.
4. Venugopal.K "Engineering Drawing and Graphics Plus Autocad", New Age International (P) Ltd., New Delhi, 2010.
5. Siddiquee A.N "Engineering Drawing with a Primer on Autocad", Prentice hall of India Ltd., New Delhi, 2004.
6. Basanth Agrawal, Agrawal C.M "Engineering Graphics" First Edition, Tata McGraw Hill, 2012
7. BVR Gupta, M Raja Roy, "Engineering Drawing with AutoCAD", IK Int Pvt Ltd, 2009.
8. NPTEL Course (www.nptel.ac.in)
9. Virtual labs (www.vlab.co.in)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

PROGRAMMING FOR ENGINEERS
(Common to all branches of Engineering)
SYLLABUS FOR BE II SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19ES210CS
3 : 0 : 0	03	40	1 hour 30 Min	60	3 hours	

Course Objectives	**Course Outcomes**
Students should be able to	At the end of the course, students will be able to
1. Acquire problem solving skills. 2. Understand the usage of arrays, structures, functions, pointers and memory management concepts. 3. Learn the advantages of user defined data types and write programs in C.	4. Apply decision making, looping constructs and functions to develop programs for a given problem. 2. Store data using arrays and perform searching and sorting operations on the data. 3. Design programs on string handling and operations on arrays using dynamic memory management techniques. 4. Develop programs to store data and perform operations using structures and files.

UNIT –I:
Control statements: Statements, Conditional Control statements: simple if, if-else, else if ladder, nested if and switch – case. Loop Control statements: for, while and do-while. Nesting of loops, Unconditional control statements: break, continue, goto; basic programs using control statements.

UNIT –II:
Functions: Introduction, Function declaration, Function call and Function definition. Passing parameters to functions. Storage classes-auto, register, static and extern. Recursion, simple programs using functions.

UNIT – III:
Arrays: 1-Dimensional array: Introduction, Sorting - selection and Bubble sort. Searching - linear and binary search . 2- Dimensional arrays: introduction, matrix operations – addition, subtraction, multiplication.
Built-in Character handling functions.
Strings: Input and Output operations using scanf(), printf(), gets(), puts() .String operations - strlen(), strcpy(), strcat(), strcmp(), strlwr(), strupr(), strrev(); basic programs using arrays.

UNIT – IV:

Pointers: Introduction to pointers, call by reference.

Structures: Structure definition, initialization and accessing the members of a structure, nested structures, passing structure to a function, unions.

UNIT-V:

Files: Introduction to files, file operations, reading data from files, writing data to files. Basic programs using structures and files.

Pre-processor Directives: Types of pre-processor directives, examples.

Learning Resources:

1. Yashavanth Kanetkar, "Let us C", 16th Edition, BPB Publications, 2018.
2. Balagurusamy E, Programming in ANSI C, 7th Edition, TMG, 2016.
3. ReemaTharaja "Introduction to C Programming", Second Edition, OXFORD Press, 2018.
4. J.R. Hanly and E.B. Koffman "Problem Solving and Program Design in C" , 7th Edition, Pearson education, 2012.
5. PradeepDey and Manas Ghosh, "Programming in C", Oxford Press, 2nd Edition, 2017.
6. https://www.tutorialspoint.com/cprogramming/index.htm
7. https://onlinecourses.nptel.ac.in/noc18-cs10/preview.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

ENGINEERING MECHANICS

(Common to Civil, Mechanical & EEE)
SYLLABUS FOR II-SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19ES210CE
3 : 0 : 0	03	40	1 hour 30 Min	60	3 hours	

COURSE OBJECTIVES	**COURSE OUTCOMES**
Objectives of this course are to:	*At the end of the course, students will be able to:*
1. Determine the mass moment of inertia and product of inertia of standard and composite sections. 2. Understand the concepts of dynamics and its principles. 3. Explain kinetics and kinematics of particles, projectiles, curvilinear motion, centroidal motion and plane motion of rigid bodies. 4. Impart the concepts of work-energy method and its applications to translation, rotation and plane motion. 5. Impart the concept of impulse momentum relation	1. Compute mass moment of inertia and product of inertia of standard and composite section. 2. Distinguish between statics and dynamics and differentiate between kinematics and kinetics. 3. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatary motion and rigid body motion. 4. Solve problems using work energy equations for translation, fixed axis rotation and plane motion. 5. Solve problems using impulse momentum equation

UNIT-I

Product of Inertia & Mass moment of Inertia: Product of inertia, Mass moment of inertia for solid and composite bodies, Radius of gyration.

UNIT–II

Kinematics: Rectilinear motion, Curvilinear motion, Projectile motion, Velocity and acceleration, Types of rigid body motion, and its analysis in a plane.

UNIT-III

Kinetics: Analysis as a particle, Analysis as a rigid body in translation, Fixed axis rotation. Rolling bodies, Plane motion.

UNIT –IV

Work Energy: Principles of work-energy and its application to translation, Fixed axis rotation and plane motion.

UNIT-V

Impulse and momentum: Introduction, linear impulse-momentum, principle of conservation of linear momentum, loss of kinetic energy.

Suggested Books:

1. Singer F.L "Engineering Mechanics", Harper & Collins, Singapore, 3rd Edition 2011.
2. Timoshenko S.P and Young D.H., "Engineering Mechanics", McGraw Hill International Edition, 1983.
3. Andrew Pytel, Jaan Kiusalaas, "Engineering Mechanics", Cengage Learning, 2014.

Learning Resources:

1. Beer F.P & Johnston E.R Jr. Vector, "Mechanics for Engineers", TMH, 2004.
2. Hibbeler R.C & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
3. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
4. Basudeb Bhattacharyya, "Engineering Mechanics", Oxford University Press, 2008.
5. Meriam. J. L., "Engineering Mechanics", Volume-II Dynamics, John Wiley & Sons, 2008.
6. NPTEL Course (www.nptel.ac.in)
7. Virtual labs (www.vlab.co.in)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB- II
(Common to all branches of Engineering)
SYLLABUS FOR BE II SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19HS211EH
0 : 0 : 2	01	30	-	50	3 hours	

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to:	**At the end of the course the learners will be able:**
1. Use language effectively without mother tongue influence. 2. Converse in various situations. 3. Make poster and power point presentations. 4. Listen to audio clippings, exchange dialogues and write short texts. 5. Speak effectively using discourse markers. 6. Read and understand various forms of texts and review them.	1. Pronounce words in isolation as well as in spoken discourse. 2. Research and sift information to make presentations. 3. Comprehend the tone and tenor of various types of speeches from media and classroom lectures. 4. Listen for gist and make inferences from various speeches. 5. Identify connectives and transitions in various speeches. 6. Use connectives and make transitions effectively while speaking.

1.0 PHONETICS LAB- TOPICS

1.1 Aspects of Connected Speech: Passages and dialogue reading.
1.2 Word Stress: Rules of Word stress and Sentence stress
1.3 Rhythm and Intonation: Introduction to rhythm and intonation; Major patterns of intonation in English with their semantic implications. Transcription.
Viva questions will be asked in internal and external exams.

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS (Advanced Level)
2.1 Public Speaking: Advantages of public speaking, essentials of an effective speech, researching, planning and delivering a speech.

2.2 Presentation Skills: Making Effective Presentations, Expressions which can be used in Presentations, Use of Non-Verbal Communication, Coping with Stage Fright, Handling Question and Answer Session; Use of Audio-Visual Aids, PowerPoint Presentations.

2.3 Interview skills- Do's and Dont's, Handling difficult questions, dress code

and code of conduct. Viva questions will be asked in internal and external exams.

3.0 READING SKILLS LAB
Study Skills: Use of Dictionary and the thesaurus for vocabulary building.
Teaching different types of texts for comprehension
Viva questions will be asked in internal and external exams.

Prescribed textbook for lab:
Speak Well : Jayshree Mohanraj, Kandula Nirupa Rani and Indira Babbellapati - Orient BlackSwan.

Learning Resources:

1. T.Balasubramanian: A textbook of English Phonetics for Indian students, Macmillan, 2008.
2. Priyadarshi Patnaik : Group discussion and Interviews, Cambridge University Press India Private Limited 2011.
3. Daniel Jones: Cambridge English Pronouncing Dictionary - A definitive guide to contemporary English Pronunciation
4. Reading Cards (Eng400): Orient Blackswan.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

APPLIED PHYSICS LAB
(Common to all branches of Engineering)
SYLLABUS FOR BE I SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19BS011PH
0 : 0 : 2	01	30	-	50	3 hours	

COURSE OBJECTIVES	**COURSE OUTCOMES**
Students are able to	*The students acquire the ability to*
1. Make precise measurements using basic physical principles and acquire skills to handle the instruments 2. Relates the theoretical Knowledge to the behavior of Practical Physical world. 3. Analyze errors in the experimental data. 4. Plot graphs between various physical parameters.	1. Conduct experiments, take measurements independently. 2. Write appropriate laboratory reports. 3. Compute and compare the experimental results and draw relevant conclusions and interpret the results. 4. Use the graphical representation of data and estimate results from graphs.

1. Determination of characteristics of He-Ne and Semiconductor lasers.
2. Determination of radius of curvature of a given Plano-convex lens by forming Newton's Rings.
3. Determination of wavelength of spectral lines of Mercury light source using diffraction grating under normal incidence.
4. Calculation of numerical aperture, acceptance angle and power loss due to bending of an optical fibre.
5. Michelson's interferometer-determination of wavelength of laser light.
6. Determination of energy gap of a given semiconductor by four probe method
7. Study of I-V characteristics of P-N Junction diode, Zener diode and LED
8. Study of I-V characteristics of solar cell and to calculate fill factor and efficiency
9. Characteristics of Photodiode and Photocell
10. Hall's effect- determination of Hall's coefficient
11. e/m of electron-Thomson's method
12. Study of resonance in LCR series & parallel circuits and to find resonant

frequency & Q- factor

13. Temperature Characteristics of Thermistor and to find Thermistor constants Melde's experiment
14. Fly Wheel –determination of moment of inertia.
15. Torsional Pendulum to calculate rigidity modulus of two wires of different materials
16. Compound Pendulum –determination of radius of gyration and acceleration due to gravity.
17. B-H curve-estimation of Hysteresis loss of a ferromagnetic sample
18. Seebeck Effect-determination of Seebeck coefficient
19. Gyroscope- study of gyroscopic effects.
20. Helmholtz coil –calculation of magnetic field along the axis

From the above pool of experiments a list can be prepared by the faculty member concerned to finalize the Branch-wise experiments appropriately depending on the theory syllabi. Each student should perform at least 12 (Twelve) experiments.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF MECHANICAL ENGINEERING

PROGRAMMING LAB
(Common to all branches of Engineering)
SYLLABUS FOR BE - II SEMESTER

L: T : P	Credits	CIE		SEE		Course Code
		Marks	Exam Duration	Marks	Exam Duration	U19ES211CS
0 : 0 : 2	01	30	-	50	3 hours	

COURSE OBJECTIVES	COURSE OUTCOMES
Students should be able to:	At the end of the course, Students will be able to:
1. Write, compile and debug programs in C. 2. Formulate solution to problems and implement in C. 3. Effectively choose programming components to solve computing problems.	1. Choose appropriate data type for implementing programs in C language. 2. Design and implement modular programs involving input output operations, decision making and looping constructs. 3. Implement search and sort operations on arrays. 4. Implement programs on string handling. 5. Design and implement programs to store data in structures and files.

1. Finding maximum and minimum of given set of numbers.
2. Finding roots of a quadratic equation.
3. Basic calculator program using switch-case statement.
4. Sin x and Cos x values using series expansion.
5. Conversion of binary to decimal, octal, hexadecimal and vice versa.
6. Generating pyramid of numbers.
7. Recursion: factorial, Fibonacci.
8. Bubble sort and selection sort.
9. Linear search and binary search.
10. Generating Pascals triangle using arrays.
11. Matrix addition, multiplication and transpose using arrays.
12. String copy, palindrome, concatenation .
13. Programs on structures and unions.
14. Finding the number of characters, words and lines of given text file.

15. File handling programs.

Learning Resources:

1. Yashavanth Kanetkar, “Let us C”, 16th Edition, BPB Publications, 2018.
2. Balagurusamy E, Programming in ANSI C, 7th Edition, TMG, 2016.
3. ReemaTharaja “Introduction to C Programming”, Second Edition, OXFORD Press,2016.
4. J.R. Hanly and E.B. Koffman “Problem Solving and Program Design in C”, 7th Edition, Pearson education, 2012.
5. PradeepDey and Manas Ghosh, “Programming in C”, Oxford Press, 2nd Edition, 2017.
6. https://www.tutorialspoint.com/cprogramming/index.htm
7. https://onlinecourses.nptel.ac.in/noc18-cs10/preview.

DEPARTMENT OF MECHANICAL ENGINEERING

SYLLABUS FOR B.E.–II SEMESTER

Engineering Workshop -II

(Common to Mechanical, Civil and EEE)

Instruction:2 Hrs /week	SEE Marks :50	Course Code : U19ES221ME
Credits : 1	CIE Marks: 30	Duration of SEE : 3 Hrs

Course objectives	Course outcomes
The course will enable the students to: 1. know basic workshop processes, adopt safety practices while working with various tools 2. identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.	At the end of the course students will be able to: 1. create models in Smithy, Welding, fitting and Machining trades by using the relevant tools. 2. measure and inspect the finished components using suitable measuring instruments.

LIST OF EXERCISES

Black Smithy
1. Flattening (round to square cross section)
2. Bending Operation (U-shape)
3. S-shape hook
4. Fullering Operation (demo)

Welding
1. Bead formation using arc welding
2. Butt joint & T joint using arc welding
3. Lap joint using gas welding`
4. Spot welding (demo)

Fitting
1. Template fitting (square fit)
2. V-groove fit
3. Drilling and Tapping
4. Assembly of pulley on a shaft with key(demo)

Machining
1. Plain turning and step turning
2. Taper turning
3. Thread Cutting
4. Additive Manufacturing (demo)

Learning Resources:

1. Hajra Choudhury S.K., Hajra Choudhury A.K., Nirjar Roy S.K. "Elements of Workshop Technology" Vol-I 2008 & Vol-II 2010 Media Promoters & Publishers Pvt. Limited, Mumbai.
2. Kalpakjian S. and Steven S. Schmid, "Manufacturing Engineering and Technology" 4th Edition, Pearson Education India Edition, 2002.
3. Gowri P., Hariharan and Suresh Babu A., "Manufacturing Technology-I", Pearson Education 2008.
4. P. Kannaiah& K. L. Narayana "Workshop manual" 2nd Ed., Scitech publications (I) Pvt. Ltd., Hyderabad.
5. B.L. Juneja, "Workshop Practice", Cengage Learning India Pvt. Limited, 2014.
6. www.technologystudent.com
7. www.mewelding.com