

Chemistry Group (Sem-I)

**COURSE WISE DETAILED
CURRICULUM**

24UG BSC-FY110 Engineering Chemistry

Lectures : 3 Hrs/Week
Credit : 3

Evaluation Scheme
ISE : 40 Marks
ESE : 60 Marks

Course Objectives: The objective of the course is to	
1) Develop an interest among the students regarding applied and engineering chemistry. 2) Study the different water quality parameters and its applications in engineering field. 3) Apply the instrumental methods for analysis of different chemical substances. 4) Analyze characteristics of fuels and use proper material for engineering application. 5) Apply the appropriate method to prevent corrosion. 6) Understand basic concepts of phase.	
Course Outcomes:	
COs	At the end of successful completion of the course, the student will be able to
CO1	Use relevant water treatment process to solve industrial problems.
CO2	Illustrate the analytical instrumental techniques for chemical analysis.
CO3	Select relevant engineering materials for applications.
CO4	Select proper fuels for domestic and industrial use.
CO5	Use corrosion preventive measures in domestic and industrial application.
CO6	Explain phase and chemical equilibrium.

Description:		
This course aims to impart fundamental knowledge of instrumental methods, engineering materials (composite, polymer), phase rule and applied knowledge of water purification methods, fuel and prevention techniques of corrosion, this will help the students to select and use relevant materials and methods which will be economical and eco-friendly.		
Prerequisites:	1:	Students should have knowledge about basic chemistry related to periodic table, chemical bonding, metals and nonmetals.
	2:	Basic concepts of reaction mechanism and state of matter.
	3:	Basic concepts of fuel and corrosion.

Section – I		
Unit 1	Water	
	Introduction, Impurities in natural water, Water quality parameters, Hardness of water, Types of hardness, Units of hardness. Ill effects of hard water in steam generation in boilers – Sludge & Scale formation. Numerical on hardness, treatment of hard water - ion exchange and reverse osmosis.	07 Hrs
Unit 2	Instrumental methods of chemical analysis	
	Introduction of instrumental methods, Spectrometry: Introduction, Laws of spectrometry – Lamberts law and Beer–Lambert’s law, Single beam spectrophotometer – schematic, working and applications. Chromatography: Introduction, types, gas – Liquid Chromatography (GLC) – basic principle, instrumentation and applications. Advantages and disadvantages of instrumental methods.	06 Hrs
Unit 3	Engineering materials	
	Macromolecules: Polymers: Introduction, Polymerization reactions – Addition and condensation polymerization, Plastics – industrially important plastics Poly vinyl chloride, Phenol formaldehyde, Urea formaldehyde & Epoxy resin, Conducting polymers Composite materials Introduction, Composition, Properties and Uses of Fiber reinforced plastics (FRP) and Glass reinforced plastic(GRP)	07 Hrs
Section – II		
Unit 4	Fuels	
	Introduction, Definition, Classification, Properties of fuels. Characteristics of good fuels, Comparison between solid, liquid and gaseous fuels, Calorific value (higher and lower), Bomb calorimeter and Boy’s calorimeter. Numerical on Bomb and Boy’s calorimeter Fuel Cells: Definition, Classification of fuel cells, Working of Solid oxide fuelcell (SOFC), Limitations and applications of fuel cells.	07 Hrs
Unit 5	Corrosion and it’s Prevention	
	Introduction, Causes, Classification, Factors affecting rate of corrosion, Corrosion prevention methods – Proper design and material selection, Cathodic protection, Protective coatings – Metallic coatings such as Hot dipping – Galvanizing and Tinning , Electroplating , Metal Spraying.	07 Hrs

	Chemical Equilibrium	
Unit 6	Introduction, Heterogeneous equilibrium, Mathematical statement of phase Rule, Terminology, Phase diagram, One component system example – Water system. Two component system example – lead - silver, Applications and Limitations of phase rule.	05 Hrs

References:

Text Books	
1	Textbook of Engineering Chemistry by S.S. Dara and S.S.Umare, S. Chand and Company Lit., New Delhi
2	Textbook of Engineering Chemistry by Shashi Chawla, Dhanpat Rai & Co.(Pvt.) Lit,Delhi
3	Textbook of Engineering Chemistry by Dr. Mrs. Jayshree Parikh , Tech-Max Publication Pune.
Reference Books	
1	Engineering Chemistry by Jain and Jain, Dhanpat Rai Publishing Company Ltd., New Delhi.
2	A Textbook of Engineering Chemistry by C. P. Murthy, C. V. Agarwal and A. Naidu, BS Publications, Hyderabad
3	Instrumental Methods of Chemical Analysis by Chatwaland Anand, Himalaya Publishing House, New Delhi
4	Engineering Chemistry by Renu Bapna and Renu Gupta, MacMillan Publishers (India) Ltd, Delhi.
5	Engineering Chemistry by Dr. A. K. Pahari and Dr. B. S. Chauhan, Laxmi Publications (P) Ltd, New Delhi.

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1	1	https://www.researchgate.net/publication/343294128_Water_Quality_Parameters https://nptel.ac.in/courses/105104102
2	2	https://archive.nptel.ac.in/courses/102/107/102107028/
3	3	https://onlinelibrary.wiley.com/journal/2365709X https://nptel.ac.in/courses/113/105/113105057/
4	4	https://www.energy.gov/eere/fuelcells/types-fuel-cells http://www.nptelvideos.in/2012/11/engineering-chemistry-1.html
5	5	https://www.electrochem.org/corrosion-science/ https://nptel.ac.in/courses/113/108/113108051/
6	6	https://www.britannica.com/science/phase-rule https://nptel.ac.in/courses/113/104/113104068/ http://www.nitttrc.edu.in/nptel/courses/video/112104248/L17.html

24UG BSC-FY102 Engineering Mathematics-I

Lectures : 3 Hrs/Week

Credit : 3

Evaluation Scheme

ISE : 40 Marks

ESE : 60Marks

COs	At the end of successful completion of the course, the student will Be able to
CO1	Find rank of matrix and solve system of linear equations.
CO2	Find characteristic equation and use it to find eigen value, eigen vector, higher power and inverse (if it exists) of square matrix.
CO3	Use De Moivre's Theorem to find roots of complex numbers and express $\sin n\theta$ and $\cos n\theta$ in powers of $\sin\theta$ and $\cos\theta$
CO4	Estimating the value of a function for the given value of the independent variable
CO5	Solve system of linear equations using numerical methods
CO6	Calculate partial derivative and apply it to find extreme values of function of two variable

Description:

Engineering Mathematics-I course is offered as the basic science course. This course contains Mathematical methods and techniques that are typically used in engineering to solve complex engineering problems. This course has six units namely i) Matrices and Solution of Linear System Equations ii) Eigen Values and Eigen vectors, iii) Complex Numbers, iv) Numerical Solution of linear simultaneous equations, v) Finite Differences, vi) Partial Differentiation and its Application

Prerequisites:	1:	Determinant, Matrix algebra	
	2:	Basic knowledge of complex numbers	
	3:	Differentiation and integration formulae.	
Section – I			
Unit 1	Matrices and Solution of Linear System Equations		
	Rank of matrix: Definition, Normal form and echelon form, System of linear homogeneous equations, System of linear Non-homogeneous equations		06 Hrs
Unit 2	Eigen Values and Eigen vectors		
	Eigen Values , Properties of Eigen Values, Eigen vectors, Properties of Eigen vectors, Cayley-Hamilton's theorem (Without proof)		06 Hrs
Unit 3	Complex Numbers		
	De Moivre's Theorem (Without proof), Roots of complex numbers by using De Moivre's Theorem, Expansion of $\sin n\theta$ and $\cos n\theta$ in powers of $\sin\theta$ and /or $\cos\theta$, Circular functions of a complex variable, Hyperbolic and Inverse Hyperbolic Functions- definitions .		07Hrs
Section – II			
Unit 4	Finite Differences		
	Forward & Backward difference operator, Shift operator, Interpolation & Extrapolation Methods , Newton's formulae (Equal intervals), Lagrange's formulae (Unequal intervals).		06Hrs
Unit 5	Numerical Solution of linear simultaneous equations		
	Gauss elimination method, Gauss-Jordan method, Jacobi's iteration method, Gauss-Seidel iteration method.		06 Hrs
Unit 6	Partial Differentiation and its Application		
	Partial derivatives: Introduction, Total derivatives, Euler's theorem on homogeneous function of two variables, Jacobian and its Properties, Maxima and Minima of functions of two variables		08 Hrs

Note-Minimum 06 Assignments should be given covering all units

References:

Text Books	
1	Higher Engineering Mathematics by Dr. B. S. Grewal, Khanna Publishers, Delhi.
2	A text book of Engineering Mathematics by N. P. Bali, Iyengar, Laxmi Publications (P) Ltd., New Delhi.
3	Engineering Mathematics I , G. V. Kumbhojkar, H. V. Kumbhojkar, C. Jamnadas & Co.
Reference Books	
1	A text book of Applied Mathematics, Vol.I, Vol. II, Vol. III by P. N. Wartikar& J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
2	Numerical methods by Dr. B. S. Grewal, Khanna Publishers, Delhi.
3	Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India Pvt. Ltd.
4	Advanced Engineering Mathematics by H. K. Dass, S. Chand, New Delhi.
5	A text book of Engineering Mathematics Volume I by Peter V. O'Neil and Santosh K.Sengar, Cengage Learning.

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1	1	https://nptel.ac.in/courses/111/107/111107112/
2	2	https://nptel.ac.in/courses/111/105/111105121/
3	5	https://nptel.ac.in/courses/111/107/111107105/
4	5	https://nptel.ac.in/courses/111/106/111106101/
5	6	https://nptel.ac.in/courses/111/107/111107108/

24UG PCC-FY111 Computer Programming in C

Lectures : 2 Hrs/Week

Evaluation Scheme

ISE : 40 Marks

ESE : 60 Marks

Course Objectives: The objective of the course is to

- 1) Understand the basics of problem solving techniques
- 2) Provide an insight into structured programming constructs in C
- 3) Give details of modular programming

Course Outcomes:

COs	At the end of successful completion of the course
CO1	Define algorithm, flowchart and implementing programs in C-languages.
CO2	Select appropriate operators in programming expressions for implementing simple C-Programs.
CO3	Explain Decision Making and Branching statements for implementing Programs.
CO4	Illustrate appropriate looping statements for implementing Programs.
CO5	Develop C programming language for applications of 1-D and 2-D Arrays.
CO6	Make use of modular programming using functions in C-Language.

Description:

This Course is designed to build programming skills in First year B.Tech students. The programming skills will be helpful to all branches of Engineering.

Prerequisites:	1:	Basic knowledge of Computers.
	2:	Computational Mathematics.

Section – I

Unit 1	Basics of C programming	
	Basics of programming: Program development steps, Algorithms / Pseudo code, flowchart, History and Importance of C, Structure of C- Program, A sample C programs, Keyword and Identifier, Basic data types and sizes, Constants, variables.	04 Hrs

	Operators and Expressions in C	
Unit 2	Introduction, Arithmetic Operators, Relation Operator, Logical Operator. Assignment Operators, Increment and Decrement Operators, Conditional Operator, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators, Some Computational Problems.	04 Hrs
	Decision Making and Branching Statements	
Unit 3	Decision Making and Branching : Introduction, Decision Making with IF Statement, Simple if Statement , if..else Statement, Nested if....else Statements, else...if Ladder, Switch statement, The ?: Operator, The goto statement. Example programs	04 Hrs
Section – II		
	Decision Making and Looping	
Unit 4	Introduction, while statement, do-while statement, for statement:Simple for loop,Additional feature of for loop, Nesting of for loop, jumps in loops, break and continue. Example programs	04 Hrs
	Arrays	
Unit 5	Introduction, Definitions of Array, Assigning and Entering value to an array, Accessing array elements/ Read data from an Array, Array Elements in Memory, 1-Dimensional, 2-Dimensional, Programs on Array operations, basic operations on matrices.	04 Hrs
	User Defined Function	
Unit 6	Introduction, Need for User-defined functions, A multifunction program/Moduler program, Prototype of Funtion/Function Declaration , Definition/Implementation of Functions, Return Values and their types, Function Calls,Category of function, Function Arguments:Call by Value. Example programs..	04 Hrs

References:

Text Books	
1	C the Complete Reference by Herbert Schild (Tata McGraw Hill) 4th Edition.
2	The C Programming Language- Brian W. Kernighan, Dennis Ritchie 2nd Edition.
Reference Books	
1	E. Balaguruswamy, "Programming in ANSI C", Tata McGraw Hill, 5th edition,2010.
2	Let Us C By Yashavant P. Kanetkar, 5th Edition.

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1.	01,02,03,04, 05 and 06	https://www.w3resource.co/ https://www.includehelp.com/c/ https://www.javatpoint.com/

24UG ESC-FY112 Engineering Mechanics

Lectures : 2 Hrs/Week

Evaluation Scheme

Credit : 2

ISE : 40 Marks

ESE : 60 Marks

Course Objectives: The objective of the course is to	
<ol style="list-style-type: none"> 1) Understand and visualize the various force systems on static bodies. 2) Study the concept of equilibrium and its imaginary existence. 3) Evaluate geometric properties of plain laminae. 4) Understand impact of rigid bodies. 	
Course Outcomes:	
COs	At the end of successful completion of the course, the student will be able to
CO1	Solve the resultant force and moment for a given system of forces.
CO2	Determine the support reactions for a given system of forces.
CO3	Calculate the support reactions for a given beams.
CO4	Determine the centroid of the different cross sections in civil and mechanical engineering.
CO5	Determine the second moment of area of the different cross sections.
CO6	Understand impact properties of material.

Description:		
<p>This course is designed to provide basic understanding about the different types of forces, moments and their effects on structural elements, which will analyze different structural systems. Students should get enough knowledge about equilibrium condition, in which entire stability depends.</p>		
Prerequisites:	1	Learners should know secondary school mathematics
	2	Learners should know the “Mechanics” section from Physics.
Section – I		
Unit 1	Fundamentals of Statics	
	Basic Concepts and Fundamental Laws, Force, System of Forces, Resultant, Equilibrant, Resolution and Composition of Forces, Moment and Couple,	
		5

	Varignon's Theorem, Law of Moments.	
Unit 2	Equilibrium of Forces	
	Basic concept of equilibrium, Equilibrium conditions, Lamis' Theorem, Free Body Diagram, Equilibrium of spheres.	5
Unit 3	Equilibrium of Beams	
	Types of Loads, Types of supports, Analysis of Simple beams, Support reactions.	4
Section – II		
Unit 4	Centroid	
	Centroid and Center of Gravity, Centroid of Standard shapes, centroid of given diagram	5
Unit 5	Moment of Inertia	
	Moment of Inertia of Standard shapes from first principle, Parallel and perpendicular axis theorem, Moment of Inertia of plain and composite figures, Radius of Gyration.	5
Unit 6	Impact and Collision of elastic bodies	
	Impact, Types of Impact, Law of conservation of Momentum, Coefficient of Restitution, Numerical on Direct central Impact and Impact on fixed plane.	4

References:

Text Books	
1	Engineering Mechanics by R. S. Khurmi, S. Chand Publications.
2	Engineering Mechanics by R. K. Bansal and Sanjay Bansal
3	Engineering Mechanics by S. S. Bhavikatti, New Age International Pvt. Ltd
4	Engineering Mechanics by D.P.Sharma, Pearson Education
Reference Books	
1	Engineering Mechanics by Manoj K Harbola, Cengage Learning
2	Vector Mechanics for Engineers Vol.I and II by F. P. Beer and E. R. Johnston, Tata Mc -Graw Hill
3	Engineering Mechanics by K. I. Kumar, Tata Mc -Graw Hill Publication

4	Engineering Mechanics by Irving H. Shames, Prentice Hall of India, New Delhi.
5	Fundamentals of Engineering Mechanics by S. Rajasekaran, G. Sankarasubramanian, Vikas Publishing House.

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1	1	https://www.youtube.com/watch?v=nGfVTNfNwnk
2	2	https://www.youtube.com/watch?v=nkg7VNW9UCc
3	3	https://www.youtube.com/watch?v=6u_rLjv-MY
4	4	https://www.youtube.com/watch?v=Fudcc0JoXdo
5	5	https://www.youtube.com/watch?v=ljDIIMvx-eg
6	6	https://www.youtube.com/watch?v=aiT5mcuXf5Y

24UG ESC-FY113 BASIC MECHANICAL ENGINEERING

Lectures : 2 Hrs/Week

Evaluation Scheme

ISE : 40 Marks

ESE : 60 Marks

Course Objectives: The objective of the course is to	
	1) Acquire basic knowledge of mechanical engineering 2) Impart knowledge of basic concepts of thermodynamics applied to industrial application 3) Understand principle of energy conversion system and power plants 4) Understand and identify power transmission devices with their functions
Course Outcomes:	
COs	At the end of successful completion of the course, the student will be able to
CO1	Describe the basic concepts of thermodynamics and solve SFEE problems.
CO2	Demonstrate working of IC Engine.
CO3	Explain working of VCRS and VARS
CO4	Explain the principles, construction and working of various power plants.
CO5	Summarize the working of energy converting and power transmission devices.
CO6	Illustrate the basic manufacturing processes.

Description:

Basic Mechanical Engineering course is offered as the basic science course. This course describes the scope of mechanical engineering in multidisciplinary industries and important phenomenon to run the world. This course describes the applications of Mechanical Engineering in many relative fields.

Prerequisites:	1:	Mathematics	
	2:	Basics of Thermodynamics	
	3:	Basics of energy sources	
Section – I			
	Thermodynamics		
Unit 1	Thermodynamic State, Process, Cycle, Thermodynamic System, Heat, work, Internal Energy, First Law of Thermodynamics, Application of First Law to steady Flow processes(Numerical Treatment), Limitations of First Law, PMM		0 5 Hrs
	Introduction to I C Engine		
Unit 2	Classification of IC engines, Construction and Working of S.I. and C.I. engines Two strokes and Four Stroke engines.		04 Hrs
	Introduction to Refrigeration and Air Conditioning		
Unit 3	Applications of Refrigeration & air conditioning Refrigerant types and Properties, Vapour compression system, vapour absorption system, Window Air Conditioning. (Descriptive Treatment only).		04 Hrs
Section – II			
	Energy Sources and power plants		
Unit 4	Renewable and nonrenewable, Photovoltaic cell Wind Power plant, Hydropower plant, Steam Power plant , Bio-gas, Bio-Diesel (Descriptive Treatment only).		04 Hrs
	Mechanical Power Transmission and Energy conversion devices		
Unit 5	Type of Belt and belt drives (Descriptive Treatment only), chain drive, Types of gears and gear Trains, Construction, working and applications of centrifugal Pump		04 Hrs
	Manufacturing Processes		
Unit 6	Introduction to manufacturing processes – Casting Process, Steps involved in casting processes, and their applications, Metal removing processes (Lathe, milling & drilling operations) Metal Joining Processes – Arc welding, soldering and brazing and their applications.		0 5 Hrs

References:

Text Books	
1	Thermal Engineering by R.K. Rajput, Laxmi Publication, Delhi, ISBN-13-978-8131808047, 9 th edition.
2	Engineering Thermodynamics by R.Joel, The English Language Book Society
3	Elements of Heat Engine Vol.I,II,III by Patel and Karamchandani, Acharya Book Depot.
Reference Books	
1	Solar Energy by Dr.S.P. Sukathame,Tata Mc-Graw Hill Publication,4th edition.
2	Power Plant Engineering by Arora and Domkunwar, Dhanpat Rai and Sons
3	Elements of Workshop Technology, Vol.I and II by Hajara Choudhari, Media Promoters

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1	1	https://nptel.ac.in/courses/112/105/112105123/
2	2	https://nptel.ac.in/courses/112/103/112103262/
3	3	https://nptel.ac.in/courses/112/107/112107208/
4	4	https://nptel.ac.in/courses/121/106/121106014/
5	5	https://nptel.ac.in/courses/112/105/112105234/
6	6	https://nptel.ac.in/courses/112/107/112107219/

24UG HSSM-FY114 Indian Knowledge System (IKS)

Lectures : 1Hrs/Week

Credit : 1

Evaluation Scheme

ISA : 30Marks

Report : 20Marks

Course Objectives: The objective of the course is to

- To make students conscious about the Traditional knowledge and its importance
- To inculcate the importance of protecting traditional knowledge and kind so traditional knowledge
- To furnish information about the various sectors in traditional knowledge and protection of IKS
- To kind them the Significance of historical places in the vicinity
- To make them aware of the importance and benefits and Yoga and Meditation

Course Outcomes:

Cos	At the end of successful completion of the course the students will be able to
CO1	Know the concept of Traditional knowledge and its importance.
CO2	Use the traditional knowledge in different sectors and perform yoga and meditation for balanced life style.
CO3	Understand the concept of intellectual property to protect the traditional knowledge.
CO4	Know the need and importance of protecting traditional knowledge.

Description:

To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system. Indian Knowledge Systems (IKS) is an innovative cell under Ministry of Education (MoE) at AICTE, New Delhi. It is established to promote interdisciplinary research on all aspects of IKS, preserve and disseminate IKS for further research and societal applications. It will actively engage for spreading the rich heritage of our country and traditional knowledge in the field of Arts and literature, Agriculture, Basic Sciences, Engineering & Technology, Architecture, Management, Economics, etc

Introduction to Traditional Knowledge		
Unit 1	<ul style="list-style-type: none"> • Define Traditional Knowledge (TK), • Nature and characteristics, • Scope and importance, Types of traditional knowledge, • Traditional knowledge Vs western knowledge 	03 Hrs

Unit 2	Traditional Knowledge in Different Sectors	
	<ul style="list-style-type: none"> • Traditional knowledge in agricultural sector • Need of meditation and its benefits in behavior pruning • Need and Importance of Yoga in educational sector • 	03 Hrs
Unit 3	Traditional Knowledge and Intellectual Property	
	<ul style="list-style-type: none"> • Systems of traditional knowledge protection, • Legal concepts for the protection of traditional knowledge, • History and development of Warana in industrial and educational complex 	03 Hrs
Unit 4	Protection of Traditional Knowledge	
	<ul style="list-style-type: none"> • The need for protecting traditional knowledge • Significance of TK Protection • Role of Government to harness TK • Significance and protection of historical places in the vicinity of TKI ET, Warana 	03 Hrs

Note: Course evaluation include an In –Semester Assessment (ISA) 30 marks consisting (not limited to) Attendance, Quizzes, Declared tests, Surprise tests, Group Discussion and Assignments etc; and 20 marks for report writing in group/Individual.

References:

Recommended Books:	
Text Books:	
1)	Traditional Knowledge System in India, by Amit Jha, 2009.
2)	<i>Traditional Knowledge System and Technology in India</i> by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan 2012..
References:	
1)	<i>Traditional Knowledge System in India</i> by Amit Jha Atlantic publishers, 2002
2)	" <i>Knowledge Traditions and Practices of India</i> " Kapil Kapoor, Michel Danino
E-resources:	
1)	https://www.youtube.com/watch?v=LZP1StpYEPM
2)	http://nptel.ac.in/courses/121106003/

**24UG HSSM-FY106 Communication Skills
(Sem - I)**

Lectures : 01 Hrs/Week

Evaluation Scheme

Credit : 1

ISE : 50 Marks

ESE : NA

Course Objectives: The objective of the course is to

- To acquaint students with basic English Grammar and help students in improving language skills
- To familiarize students with concept, various types, barriers and filters of communication
- To assist students in developing Vocabulary
- To aid them in understanding corporate meetings
- To train the students to compose and write the business letters effectively

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to
CO1	Understand basic concepts of grammar in application letters
CO2	Understand communicative techniques to participate in several activities
CO3	Recall appropriate vocabulary for various contexts
CO4	Demonstrate interpersonal skills with precision and competence in different scenario.
CO5	Write business letters by using appropriate language tools

Description:

In the era of globalization, the most commonly used medium to express oneself is English language, especially in the industry, where almost all the service manuals, installation and commissioning manuals of the various equipment are in English and the technologist has to interpret them correctly. English is the dire need, not only for the Indian industry, but also worldwide, where the Engineering Graduates have the opportunity to take up jobs. Therefore, the basic English reading and writing skills have become almost mandatory for employment in the industry. Hence, English language has become quite a necessity for engineering students. This course is therefore designed to help the students to learn the correct grammatical structures and use the relevant vocabulary while reading and writing. Also introduce the communication theory, report writing & business correspondence to them.

Prerequisites:	1:	Basic Knowledge of English Grammar
	2:	Reading and Listening Comprehension
	3:	Basic knowledge of Writing Skills

Unit 1	Ice Breaking and Rapid Review of Grammar	
	<ul style="list-style-type: none"> • Knowing each other Self introduction • Basic application letters (Applications for various occasions etc.) • Parts of Speech • Types of Sentences, Tenses / Verbal forms 	03 Hrs
Unit 2	Introduction to Communication and it' s Organization	
	<ul style="list-style-type: none"> • Nature, Importance and Process of Communication • Basic Types: Verbal- Non- verbal Communication • Nature of Communication.-Formal & Informal • Directions of Communication: • Levels of Communication • Barriers & Filters to Communication 	04 Hrs
Unit 3	Vocabulary Building	
	<ul style="list-style-type: none"> • Synonyms & Antonyms, Prefixes and Suffixes • Words often Confused: Homonym & Homophone • Idioms and Phrases 	02 Hrs
Unit 4	Corporate Meetings	
	<ul style="list-style-type: none"> • Significance and Types of Meeting • Strategies of Conducting and Attending Meeting Effectively • Record Keeping: Notice, Agenda and Minutes 	02 Hrs
Unit 5	Business Correspondence	
	<ul style="list-style-type: none"> • Importance of Correspondence & Elements of Letter Writing • Structure or Layouts (American & British) • Letters: Inquiry, Order Placement, Complaint and its Adjustment, Invitation Letter 	03 Hrs

References:

Recommended Books	
01	<i>Communication Skills by Meenakshi Raman and Sangeeta Sharma, Oxford University Press 2016 1st Edition.</i>
02	<i>Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)</i>
03	<i>Basic Communication Skills for Technology by Rutherford, Andrea J. (2002).. Delhi: Pearson Education Asia</i>
04	<i>Mastering Communication by Nicky Stanton, Palgrave Master Series</i>
05	<i>Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English. Cambridge: Cambridge University Press. (Reprint)</i>
06	<i>Sharma, R. C. and Krishna Mohan, Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, Tata McGraw-Hill Publishing Company Limited, India ,5th Edition, 2017</i>
07	<i>Written Communication in English by Saran Freeman (Orient Longman)</i>
08	<i>Seely, J. The Oxford Guide to Writing and Speaking, Oxford University Press, India 3rd Edition , 2013</i>

09	<i>High School English Grammar and Composition by Wren and Martin, Blackie, 2000</i>
10	<i>Essential English Grammar (Elementary & Intermediate) Raymond Murphy (CUP)</i>
11	<i>Sethi, J. and Dhamija P.V. A Course in Phonetics and Spoken English Prentice-Hall of India 2nd Edition, 2006</i>
12	<i>English Language Laboratories, by Nira Konar, PHI Learning, 2014</i>
13	<i>Perspective of Communication and Communicative Competence, M.V. Rodriques, Concept Publishing Company, New Delhi-10059</i>
	www.buisnesscommunicationskills.com
	www.kcitraing.com
	www.mindtools.com

24UG BSC-FY 110LP- ENGINEERING CHEMISTRY Lab

Tutorial/Practical : 2 hr/week

Credit : 1

Evaluation Scheme

ISA : 25 Marks

POE : NA

COs	At the end of successful completion of the course, the student will be able to
CO1	Use relevant water treatment process to solve industrial problems.
CO2	Illustrate the analytical instrumental techniques for chemical analysis.
CO3	Select relevant engineering materials for applications.
CO4	Select proper fuels for domestic and industrial use.
CO5	Use corrosion preventive measures in domestic and industrial application.
CO6	Explain phase and chemical equilibrium.

Description:

This course aims to impart fundamental knowledge of instrumental methods, engineering materials (composite, polymer), phase rule and applied knowledge of water purification methods, fuel and prevention techniques of corrosion, this will help the students to select and use relevant materials and methods which will be economical and eco-friendly.

Prerequisites:	1:	Students should have knowledge about basic chemistry related to periodic table, chemical bonding, metals and nonmetals.
	2:	Basic concepts of reaction mechanism and state of matter.
	3:	Basic concepts of fuel and corrosion.

Number	Practical/ Experiment/Tutorial Topic	Hrs.
1	Determination of acidity of water	2
2	Determination of total alkalinity of water sample.	2
3	Determination of chloride content of water by Mohr's method.	2
4	Determination of temporary and permanent hardness of water sample by EDTA method.	2

5	Determination of moisture content in a given coal sample by proximate analysis	2
6	Determination of volatile content in a given coal sample by proximate analysis	2
7	Determination of ash content in a given coal sample by proximate analysis	2
8	Preparation of urea-formaldehyde resin	2
9	Preparation of phenol-formaldehyde resin	2
10	Determination of percentage of copper in brass by iodometry.	2
11	Estimation of zinc in brass solution	2
12	Determination of rate of corrosion of aluminium by weight loss method in acidic and basic medium	2
13	Determination of amount of copper present in unknown sample by colorimeter	2
14	Demonstration of paper chromatography	2

**Suggested list of practicals is given in the above table. Students need to perform minimum 10 practicals to fulfill the ISA evaluation.*

References:

Text Books	
1	Textbook of Engineering Chemistry by S.S. Dara and S.S.Umare, S. Chand and Company Lit., New Delhi
2	Textbook of Engineering Chemistry by Shashi Chawla, Dhanpat Rai & Co.(Pvt.) Lit,Delhi
3	Textbook of Engineering Chemistry by Dr. Mrs. Jayshree Parikh , Tech-Max Publication Pune.
Reference Books	
1	Engineering Chemistry by Jain and Jain, Dhanpat Rai Publishing Company Ltd., New Delhi.
2	A Textbook of Engineering Chemistry by C. P. Murthy, C. V. Agarwal and A. Naidu, BS Publications, Hyderabad
3	Instrumental Methods of Chemical Analysis by Chatwaland Anand, Himalaya Publishing House, New Delhi
4	Engineering Chemistry by Renu Bapna and Renu Gupta, MacMillan Publishers (India) Ltd, Delhi.
5	Engineering Chemistry by Dr. A. K. Pahari and Dr. B. S. Chauhan, Laxmi Publications (P) Ltd, New Delhi.

VLab Link:

- 1) **Experiment name-** Determination of Viscosity (**Lab Name-** Viscosity virtual lab)
<http://vlab.amrita.edu/?sub=2&brch=190&sim=339&cnt=1>
- 2) **Experiment name-**Water Analysis-Physical Parameter (**Lab Name-**Inorganic Chemistry virtual lab) <http://vlab.amrita.edu/?sub=2&brch=193&sim=575&cnt=1>
- 3) **Experiment name-**Water Analysis-Chemical Parameter(**Lab Name-** Inorganic Chemistry virtual lab) <http://vlab.amrita.edu/?sub=2&brch=193&sim=1548&cnt=1>
- 4) **Experiment name-** Acid Base Titration (**Lab Name-** Inorganic Chemistry virtual lab)
<http://vlab.amrita.edu/?sub=2&brch=193&sim=352&cnt=1>
- 5) **Experiment name-** Soil Analysis (**Lab Name-** Inorganic Chemistry virtual lab)
<http://vlab.amrita.edu/?sub=2&brch=193&sim=1549&cnt=1>
- 6) **Experiment name-** Alloy Analysis (Brass) (**Lab Name** – Inorganic Chemistry virtual lab)
<http://vlab.amrita.edu/?sub=2&brch=193&sim=1255&cnt=1>
- 7) **Experiment name** – Spectrophotometry (Physical Chemistry virtual lab)
<http://vlab.amrita.edu/?sub=2&brch=190&sim=338&cnt=1>

24UG BSC-FY102LT Engineering Mathematics I

Teaching Scheme:

Evaluation Scheme:

Tutorials: 1/week

Credit: 1

ISA: 25 Marks

Course Objectives: The objective of the course is to	
	<ul style="list-style-type: none">• To provide detailed of matrices which is applied for solving system of linear equations and useful in various fields of technology• This course enables the students to learn the concept of imaginary numbers and gives awareness about algebra of complex numbers which helps in understanding of engineering subjects like electrical circuits, Electromagnetic wave theory, and complex analysis etc.• To build ability to solve numerically system of linear equations, algebraic and transcendental equations. To provide an overview of the experimental aspect of applied mathematics.• This course enables to provide an overview of partial derivatives and its applications which is used for solving optimization problems and concepts is needed in study of wave, heat equation of various orders and also in calculation of errors in various engineering subjects.
Course Outcomes:	
Cos	At the end of successful completion of the course the student will be able to
CO1	Find rank of matrix and solve system of linear equation.
CO2	Find eigen values and eigen vectors and verifies cayley Hamilton's theorem
CO3	Apply De Moivre's Theorem to find roots of complex numbers, expand powers of $\sin n\theta$ and $\cos n\theta$
CO4	Compute forward and backward difference, Apply Newton's & Lagrange's interpolation Formulae.
CO5	Solve system of liner equations numerically
CO6	Find partial derivative and apply it to find maxima & Minima of function of two variable

Description:		
Engineering Mathematics-I course is offered as the basic science course. This course contains Mathematical methods and techniques that are typically used in engineering to solve complex engineering problems. This course has six units namely i) Matrices and Solution of Linear System Equations ii) Eigen Values and Eigen vectors, iii) Complex Numbers, iv) Numerical Solution of linear simultaneous equations, v) Finite Differences, vi) Partial Differentiation and its Application		
Prerequisites:	1:	Determinant, Matrix algebra
	2:	Basic knowledge of complex numbers
	3:	Differentiation and integration formulae.

Tutorials:

Number	Practical/Experiment/TutorialTopic	Hrs.
1	Rank by Normal form & Echelon form	1
2	Solution of system of linear equation	1
3	Eigen values & Eigen Vectors	1
4	Cayley Hamilton's Theorem	1
5	De Moivre's Theorem	1
6	Roots of complex number	1
7	Newton's Interpolation	1
8	Lagrange's Interpolation Formula	1
9	Gauss elimination method & Gauss Jordan method	1
10	Jacobi Iteration & Gauss Seidel Iteration Method	1
11	Partial Derivative, Euler's Theorem	
12	Jacobian, Maxima & minima	

24UG PCC-FY111LP Computer Programming in C Lab

Tutorial/Practical : 2 hr/week
Credit : 1

Evaluation Scheme
ISA : 25 Marks

COs	At the end of successful completion of the course, the student will be able to
CO1	Define algorithm , flowchart and implementing programs in C language.
CO2	Select appropriate operators in programming expressions for implementing simple C programs.
CO3	Explain decision making and branching statements for implementing programs.
CO4	Illustrate appropriate looping statements for implementing programs.
CO5	Develop C programming language for applications of 1-D and 2-D arrays.
CO6	Make use of modular programming using functions in C language

Description:

This Course is designed to build programming skills in First year B.Tech students. The programming skills will be helpful to all branches of Engineering. The student will learn basic programming concepts from declaring a variable, conditional statements, looping to the concepts of arrays.

Prerequisites:	1:	Basic knowledge of Computers.
	2:	Computational Mathematics.

Tutorials

Number	Practical/ Experiment/Tutorial Topic	Hrs.
1	Write a Program to Demonstrate how to read and display the value in all Basic data type variables. Example:	2

	<p>WAP to display the details of the Student Like:</p> <ol style="list-style-type: none"> 1. Roll_No of Student 2. Division of Student 3. Height and Weight of Student. 	
2	Write a C Program to demonstrate the working of Arithmetic operations using arithmetic operators in C.	2
3	<p>Write a C Program to do the following using relational operators and branching statement:</p> <ol style="list-style-type: none"> a. Read two integers and check they are equal or not. b. Print the greatest of Two numbers. 	2
4	<p>Write a Program to enter student marks through keyboard and find grade using the conditional operator. grades are</p> <ol style="list-style-type: none"> 1. Honor- 90 above 2. Distinction-80 to 89 3. Grade A+ - 70 to 79 4. Grade A - 60 to 69 5. Grade B - 50 to 59 6. Pass Grade - 40 to 49 7. Fail - Below 40 	2
5	Write a C Program to demonstrate Switch Statement and Constant Variable by finding the area of Circle, Rectangle, Square and Triangle considers each as a different case.	2
6	<p>Write a C Program to demonstrate looping statements.</p> <ol style="list-style-type: none"> a. Find the Factorial by given a number. b. Count total number of digits for a given integer number. c. Find the Sum of Digits in a given number. d. Reverse the given integer number and display the same on the output screen. 	2
7	Write a C program to read N numbers in an integer array and print it in reverse order.	2
8	Write a C program to read N numbers in an array and display the sum of array elements.	2
9	Write a program to read two matrices and store the addition of two matrices in the third matrix.	2
10	Write a C Program to swap two numbers using call by value.	2

References:

Text Books	
1	C the Complete Reference by Herbert Schild (Tata McGraw Hill) 4th Edition.
2	The C Programming Language- Brian W. Kernighan, Dennis Ritchie 2nd Edition.
Reference Books	
1	E. Balaguruswamy, "Programming in ANSI C", Tata McGraw Hill, 5th edition,2010.
2	Let Us C By Yashavant P. Kanetkar, 5th Edition.

Web Links Practicals

1. <http://cse02-iiith.vlabs.ac.in/>
2. <https://codeforwin.org/category/c-programming>
3. <https://www.w3resource.co/>

24UG ESC-FY112LP - ENGINEERING MECHANICS Lab

Tutorial/Practical : 2 hr/week

Credit : 1

Evaluation Scheme

ISA : 25 Marks

POE : NA

Course Objectives: The objective of the course is to

- 1) Understand the vector mechanics.
- 2) Visualize concept of equilibrium and its imaginary existence.
- 3) Apply equilibrium conditions for various cases.
- 4) Find support reactions of beams

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to
CO1	Determine the resultant of concurrent coplanar force system graphically.
CO2	Analyze the force the given force system.
CO3	Verify the law of moment of given force system.
CO4	Determine the support reactions of the given beam.

Description:

This course is designed to provide basic understanding about the different types of forces, moments and their effects on structural elements, which will analyze different structural systems. Students should get enough knowledge about equilibrium condition, in which entire stability depends.

Prerequisites:	1	2
	1	Learners should know secondary school mathematics
	2	Learners should know the “Mechanics” section from Physics.

Practical

Number	Practical/ Experiment/Tutorial Topic	Hrs.
1	Law of polygon of forces	2
2	Jib crane	2
3	Bell crank lever	2
4	Support Reactions of Beam	2
5	To find Resultant by Graphical Method	2
6	To find Support Reactions by Graphical Method	2
7	Assignment on finding Resultant	2
8	Assignment on Equilibrium of Sphere	2
9	Assignment on Finding support reactions of beam	2
10	Assignment on finding Centroid of given shape	2
11	Assignment on finding Moment of Inertia of given shape	2
12	Assignment on impact of elastic bodies	2

References:

Text Books	
1	Engineering Mechanics by R. S. Khurmi, S. Chand Publications.
2	Engineering Mechanics by R. K. Bansal and Sanjay Bansal
3	Engineering Mechanics by S. S. Bhavikatti, New Age International Pvt. Ltd
4	Engineering Mechanics by D.P.Sharma, Pearson Education
Reference Books	
1	Engineering Mechanics by Manoj K Harbola, Cengage Learning
2	Vector Mechanics for Engineers Vol.I and II by F. P. Beer and E. R. Johnston, Tata Mc -Graw Hill
3	Engineering Mechanics by K. I. Kumar, Tata Mc -Graw Hill Publication
4	Engineering Mechanics by Irving H. Shames, Prentice Hall of India, New Delhi.

24UG ESC-FY113LP - BASIC MECHANICAL ENGINEERING Lab

Tutorial/Practical : 2 hr/week

Credit : 1

Evaluation Scheme

ISA : 25 Marks

POE : NA

COs	At the end of successful completion of the course, the student will be able to
CO1	Describe the working of IC engine
CO2	Classify Renewable and non-renewable energy sources
CO3	Explain different mechanisms for power transmission systems
CO4	Understand various basic operations of Lathe, Milling and Drilling machines

Description:

As this subject has huge scope in various industries, so in labs the concept, construction, working and demonstration of various machines, equipment and devices is observed and understood with the help of various models.

Prerequisites:	1:	Theory knowledge of types and components of IC engine.
	2:	Theory knowledge of types and components of refrigeration and air conditioning system.
	3:	Theory knowledge of types of energy sources

Number	Practical/ Experiment/Tutorial Topic	Hrs.
1	Solving SFEE numericals	4

2	Demonstration of I.C. engine	4
3	Demonstration of vapour compression refrigeration system and window air conditioner.	4
4	Demonstration of various power plants such as Windmill / Biogas / Hydroelectric Power Plant etc.	4
5	Demonstration of belt drive, chain drive, gear trains and centrifugal pump	4
6	Demonstration of casting, metal removal and metal joining processes	4

References:

Text Books	
1	Thermal Engineering by R.K. Rajput, Laxmi Publication, Delhi, ISBN-13-978-8131808047, 9 th edition.
2	Engineering Thermodynamics by R.Joel, The English Language Book Society
3	Elements of Heat Engine Vol.I,II,III by Patel and Karamchandani, Acharya Book Depot.
Reference Books	
1	Solar Energy by Dr.S.P. Sukathame, Tata Mc-Graw Hill Publication, 4th edition.
2	Power Plant Engineering by Arora and Domkunwar, Dhanpat Rai and Sons
3	Elements of Workshop Technology, Vol.I and II by Hajara Choudhari, Media Promoters

24UG HSSM-FY106LP Communication Skills (Sem - I) – PRACTICAL

Tutorial/Practical : 02 hr/week

Evaluation Scheme

Credit : 1

ISA : 25 Marks

Course Objectives: The objective of the course is to	
<ul style="list-style-type: none"> •To acquaint students with basic English Grammar and help students in improving language skills •To assist students in developing Vocabulary and phonetic drill •To aid them in understanding corporate meetings •To train the students to compose and write the business letters effectively 	
Course Outcomes:	
COs	At the end of successful completion of the course, the student will be able to
CO1	To formulate grammatical sentences correctly and apply communicative techniques effectively
CO2	Understand and use vocabulary effectively
CO3	Display standard writing skills while composing business letters and report preparation

Description:	
This course is designed to help the students to practice the correct grammatical structures and use the relevant vocabulary while reading and writing. Also give them practical experience of corporate meetings, Phonetics, Intonation and articulation Drill. Similarly provide them with basic structure and lay out of report writing & business correspondence.	
Prerequisites:	1: Basic Knowledge of English Grammar
	2: Reading and Listening Comprehension
	3: Basic knowledge of Writing Skills

Practical

Number	Practical/ Experiment/Tutorial Topic	Hrs
01	Star of Life: Introducing Yourself	02
02	Vocabulary Building Exercises	02
03	Vocabulary Building Exercises	02
04	Grammar Activities – Irregular verb list	02
05	Conducting & Attending Meeting	02
06	Conducting & Attending Meeting	04
07	Practice on writing General Applications	02
08	Practice on Business Correspondence	02

References:

Recommended Books	
01	<i>Communication Skills by Meenakshi Raman and Sangeeta Sharma, Oxford University Press 2016 1st Edition.</i>
02	<i>Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)</i>
03	<i>Basic Communication Skills for Technology by Rutherford, Andrea J. (2002).. Delhi: Pearson Education Asia</i>
04	<i>Mastering Communication by Nicky Stanton, Palgrave Master Series</i>
05	<i>Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English. Cambridge: Cambridge University Press. (Reprint)</i>
06	<i>Sharma, R. C. and Krishna Mohan, Basic Correspondence and Report Writing: A Practical Approach to Business and Technical Communication, Tata McGraw-Hill Publishing Company Limited, India ,5th Edition, 2017</i>
07	<i>Written Communication in English by Saran Freeman (Orient Longman)</i>
08	<i>Seely, J. The Oxford Guide to Writing and Speaking, Oxford University Press, India 3rd Edition , 2013</i>
09	<i>High School English Grammar and Composition by Wren and Martin, Blackie, 2000</i>
10	<i>Essential English Grammar (Elementary & Intermediate) Raymond Murphy (CUP)</i>
11	<i>Sethi, J. and Dhamija P.V. A Course in Phonetics and Spoken English Prentice-Hall of India 2nd Edition, 2006</i>
12	<i>English Language Laboratories, by Nira Konar, PHI Learning, 2014</i>
13	<i>Perspective of Communication and Communicative Competence, M.V. Rodriques, Concept Publishing Company, New Delhi-10059</i>
	www.buisnesscommunicationskills.com
	www.kcitraing.com
	www.mindtools.com

24UG CC-FY115T Inquisitive learning

Teaching Scheme:

Practical's: 2 hrs per week

Credits: 1

Evaluation Scheme:

ISA: 25 Marks

Presentation: 25 Marks

Total Marks: 50 Marks

Cos	At the end of successful completion of the course the student will be able to
CO1	Identify real life problems through rigorous literature survey from societal need point of view.
CO2	Analyze the identified problems through technological perspective.
CO3	Proposed suitable solution to contribute society using fundamental knowledge of engineering through modern tools.
CO4	Use of technology to demonstrate proposed work in oral & written form.
CO5	Develop ability to work as an individual and as a team member and inculcate attitude of this for lifelong learning.

Group Structure:

Working in supervisor/mentor – monitored groups. The students Should plan, manage and complete a task/project/activity which addresses the stated problem.

- There should be team/group of 5 -6 students
- A supervisor/mentor teacher assigned to individual groups

Selection of Project/Problem:

The problem-based project oriented model for learning is recommended. The model begins with the identifying of a problem, often growing out of a question or “wondering”. This formulated problem then stands as the starting point for learning. Students design and analyze the problem within an articulated interdisciplinary or subject frame. A problem can be theoretical, practical, social, technical, symbolic, cultural and/or scientific and grows out of students’ wondering within different disciplines and professional environments. A chosen problem has to be exemplary. The problem may involve an

interdisciplinary approach in both the analysis and solving phases .By exemplarity, a problem needs to refer back to a particular practical, scientific, social and/or technical Department of First Year B.Tech domain. The problem should stand as one specific example or manifestation of more general learning outcomes related to knowledge and/or modes of inquiry. There are no commonly shared criteria for what constitutes an acceptable project. Projects vary greatly in the depth of the questions explored, the clarity of the learning goals, the content and structure of the activity.

- A few hands-on activities that may or may not be multidisciplinary
- Use of technology in meaningful ways to help them investigate, collaborate, analyze, synthesize and present their learning.
- Activities may include-Solving real life problem, investigation /study and Writing reports of in depth study, field work.

Assessment:

The institution/head/mentor is committed to assessing and evaluating both student performance and program effectiveness. Progress of Inquisitive learning is monitored regularly on weekly basis. Weekly review of the work is necessary. During process of monitoring and continuous assessment AND evaluation the individual and team performance is to be measured. Inquisitive learning is monitored and continuous assessment is done by supervisor/mentor and authorities. Students must maintain an institutional culture of authentic collaboration, self-motivation, peer-learning and personal responsibility. The institution/department should support students in this regard through guidance/orientation programs and the provision of appropriate resources and services. Supervisor/mentor and Students must actively participate in assessment and evaluation processes.

- Group may demonstrate their knowledge and skills by developing a public product and/or report and/or presentation.
- Individual assessment for each student (Understanding individual capacity, role and involvement in the project)
- Group assessment (roles defined, distribution of work, intra-team communication and togetherness)
- Documentation and presentation

Evaluation and Continuous Assessment:

It is recommended that the all activities are to be record and regularly, regular assessment of work to be done and proper documents are to be maintained at college end by both students as well as mentor (you may call it Inquisitive learning work book).Continuous Assessment Sheet (CAS) is to be maintained by all mentors/department and institutes. Recommended parameters for assessment, evaluation and weightage:

- Idea Inception (10%)
- Outcomes of Inquisitive learning / Problem Solving Skills/ Solution provided/ Final product (Individual assessment and team assessment) (20%)
- Documentation (Gathering requirements, design & modeling, implementation/execution, use of technology and final report, other documents) (20%)
- Demonstration (Presentation, User Interface, Usability etc) (50%)

Inquisitive learning workbook will serve the purpose and facilitate the job of students, mentor and project coordinator. This workbook will reflect accountability, punctuality, technical writing ability and work flow of the work undertaken.

Recommended Guidelines and Phases:

It is learning through activity. Following are the recommended guidelines that will work as an initiator and facilitator in process of completion of Inquisitive learning.

1. Get groups of students registered preferably 4-6 students per group.
2. Assign mentor to each group.
3. Provide guidelines for title identification (Problem can be some real life situation that needs technology solutions. This situation can be identified by meeting people around, visiting various industries, society, and institutes. The solution can be prototype, model, convertible solutions, survey and analysis, simulation, and similar).
4. Let students submit the problem identified in prescribed format (Title, Problem statement, details of a problem undertaken, and what is need of solution to the problem)
5. Mentor can approve the problem statements based on feasibility and learning outcomes expected for first year engineering students
6. Mentor is to monitor progress of the task during phases of project work. Broadly phases may include- requirements gathering, preparing a solution, technology design for the solution. (Optional phases- implementation and testing)
7. Fortnightly monitoring and continuous assessment record is to be maintained by mentor.
8. Get the report submitted at the end of semester.

Evaluation and Assessment Sheet (To be filled in my mentor)			
Sr. No.	Details	Maximum Marks	Marks Obtained
1.	Problem Identification (Idea Inception)	05	
2.	Problem Analysis (Requirement Gathering)	05	
3.	Proposed Solution (Model/Design/ Process / prototype)	05	
4.	Report	10	
5.	Presentation	25	
Total Marks		50	
Date:			
Name & Sign of Mentor			

24UG MAC-FY109A Democracy, Elections & Good Governance

Course Outcomes (CO's with Unit Numbers)

COs	At the end of successful completion of the course , the student will be able to	Unit No.
CO1	Express the different aspects of democracy and its implications in the overall development of the state.	01
CO2	Explain 73rd and 74th Constitutional Amendment Acts and Local Body Elections.	02
CO3	Describe the importance and role of the Good Governance.	03

Course Objectives: The objective of the course is to

The rationale of the study is to make the pupils aware of the importance of democracy. What constitute democracy, what is its importance from the point of view of the role of individual and what exactly can a individual get if he performs his role well in the society. This module also aims to make the individual understand the different aspects of democracy and its implications in the overall development of the state. The syllabus is introduced from the point of view that all students upon entering into the college, enroll themselves as voters and encourage and enthuse other members of the society to participate not only in election process but also electoral and political process in general.

Unit 1	Democracy in India
	Dimensions of Democracy: Social, Economic and Political, Decentralization: Grassroots Level Democracy – Challenges before, Challenges before Democracy: women and marginalized sections of the society
Unit 2	Election to Local Self Government Bodies
	73rd and 74th Constitutional Amendment Acts: Institutions at the local level and Role of State Election commission, Local Body Elections: Urban & Rural, Duties of an Individual towards electoral process
Unit 3	Good Governance
	Meaning and concept, Government and Governance, Good Governance initiatives in India.

