

Chemistry Group (Sem-II)

**COURSE WISE DETAILED
CURRICULUM**

FY102 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) study the different water quality parameters and its applications in engineering field. 2) demonstrate the structural and functional role of biomolecules essential for cellular reactions. 3) Enlist the chemical and biological differences between DNA, RNA and their role in cellular behavior. 4) develop an interest among the students regarding applied and engineering chemistry. 5) analyze characteristics of fuels. 6) understand basic properties of metals and alloys.		
Course Outcomes:		
COs	At the end of successful completion of the course, the student will be able to	Blooms Taxonomy
CO1	Recall the terms, basic properties of water analyze water sample for pollution control.	Remember
CO2	Utilize the knowledge of biomolecules	Analyze
CO3	Apply Knowledge of engineering materials in various technical fields and in construction.	Apply
CO4	Select proper fuels for domestic , and industrial applications.	Apply
CO5	Analyze engineering problems related to corrosion and metal finishing in achieving a practical solution. apply the significance of corrosion in industries	Analyze
CO6	Explain chemical equilibrium using various terms (Phase , Components & Degree of freedom	Understand

Description:		
This course aims to impart fundamental knowledge of engineering materials (composite, polymer Cement), and applied knowledge of water purification methods, analysis of amino acids using ninhydrin test, energy storage devices, prevention techniques of corrosion. Students will be expected to communicate knowledge to society and industry.		
Prerequisites:	1:	Students should have knowledge about basic chemistry related to electrochemistry and occurrence of metals,
	2:	periodic table physical and chemical properties of elements
	3:	Applications of fuel and different macromolecules

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 , scale & sludge formation. Numericals on hardness, treatment of hard water (ion exchange and reverse osmosis). Green Chemistry :Definition, Twelve principles of green chemistry, Industrial	08 Hrs
Unit 2	Chemistry of living cell	
	Cell & cellular constituents and their functions. Various classes of biological molecules & functions. a) Amino acids : Definition, Nomenclature, General structure and classification of amino acids : 1) Neutral amino acids: Hydrocarbon chain amino acids-Glycine, Alanine, Valine, Leucine, Isoleucine. 2) Acidic amino acids and their amides: Aspartic acid, Glutamic acid, Asparagine, Glutamine. 3) Basic aminoacids: Lysine Arginine, Histidine, b) Nucleic acids: Introduction, Meaning, Definition, Distinction between DNA and RNA, Components of nucleic acids viz, bases, sugars. Nucleosides and nucleotides,	05 Hrs
Unit 3	Engineering materials	
	Macromolecules: Polymers : Introduction, Addition and condensation polymers examples ; plastics --industrially important plastics(PF,UF & Epoxy resin) Conducting polymers and Biopolymers, Molecular Weight of polymers. Composite materials Introduction, Composition, properties and uses of fiber reinforced plastics (FRP) example 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: Defination, classification of fuel cells, working of Solid oxide fuel cell (SOFC), limitations and applications of fuel cells.	07Hrs
Unit 5	Corrosion and it's Prevention	
	Introduction, Concept of electrode potential, Nernst Theory , causes, classification, Factors affecting rate of corrosion corrosion monitoring and protection from corrosion prevention methods .such as Proper design and material selection,cathodic protection, Prevention methods and protective coatings- Metallic and Non metallic coatings , such as Hot dipping (galvanizing and tinning,), electroplating ,	07Hrs

	Metal cladding ,Metal Spraying	
Unit 6	Chemical Equilibrium	05Hrs
	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.	

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1	3	--	--	--	--	--	--	--	--	--	--	1			
CO2	3	1	--	--	--	--	--	--	--	--	--	1			
CO3	3	--	--	--	2	--	--	--	--	--	--	1			
CO4	3	1	--	--	--	--	--	--	--	--	--	1			
CO5	--	--	--	--	--	--	--	--	--	--	--	1			
CO6	--	--	--	--	--	--	--	--	--	--	--	1			

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, DhanpatRai 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	ChatwalandAnand,InstrumentalMethodsofChemicalAnalysis,HimalayaPublishingHouse,New Delhi
4	A text Book of Engineering Chemistry by ShashiChawla, DhanpatRai& Co. (Pvt.) Ltd, Delhi
5	Engineering Chemistry by Renu Bapna and Renu Gupta, MacMillan Publishers (India) Ltd, 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/122/106/122106028/ https://nptel.ac.in/courses/105/108/105108081/
2	2	https://www.britannica.com/science/biomolecule https://www.digimat.in/102.html
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

FY201 Engineering Mathematics-II

Lectures : 3 Hrs/Week

Credit : 3

Evaluation Scheme

ISE : 40 Marks

ESE : 60 Marks

Course Objectives: The objective of the course is to		
1) Model a real life scenario into differential equations and solve them analytically and numerically		
2) Learn different methods of solving improper and multiple integral		
Course Outcomes:		
COs	At the end of successful completion of the course, the student will be able to	Blooms Taxonomy
CO1	Solve linear and nonlinear ordinary differential equations of order one and find orthogonal trajectory.	Knowledge, Application
CO2	Find numerical solutions of ordinary differential equations of first order and first degree.	Knowledge
CO3	Compute double and triple integrals.	Knowledge
CO4	Find area, mass of plane lamina using double integral.	Application
CO5	Evaluate definite integrals using Gamma and Beta functions.	Evaluation
CO6	Solve definite integral numerically.	Knowledge

Description:		
Engineering Mathematics-II 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) Differential equation of first order first degree and Applications, ii) Numerical Solution of Differential Equation of order one degree One, iii) Integral Calculus, iv) Numerical Integration, v) Multiple Integrations and vi) Application of Multiple Integrals		
Prerequisites:	1:	Trigonometric identities and Logarithmic identities
	2:	Differentiation and integration formulae
	3:	Shapes of basic curves like circle, parabola, ellipse, straight line.
Section – I		
Unit 1	Differential equation of first order first degree and Applications	
	Exact Differential Equation, Reducible to Exact Differential Equation, Linear Differential Equation, Reducible to Linear, Application to orthogonal trajectory (Cartesian and Polar)	8 Hrs

TextBooks	
1	Higher Engineering Mathematics, Dr. B. S. Grewal, S. Chand and Company, 40th Edition.
ReferenceBooks	
1	Advanced Engineering Mathematics”, H. K. Das, S. Chand Publication, 8th Edition.
2	A Text Book of Applied Mathematics”, Vol. I and II, P. N. Wartikar and J. N. Wartikar, Vidyarthi GrihaPrakashan, Pune.
3	A textbook of Engineering Mathematics, N. P. Bali, Iyengar, Laxmi Publications (P) Ltd, New Delhi
4	Advanced Engineering Mathematics, Erwin Kreyszig, Wiley India Pvt. Ltd

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1	1	https://nptel.ac.in/courses/111/106/111106100/
2	2	https://nptel.ac.in/courses/111/107/111107063/
3	3,4,5	https://nptel.ac.in/courses/111/105/111105122/
4	6	https://youtu.be/_cgzqVmvqtQ

FY109. Computer Programming in C

Lectures : 2 Hrs/Week

Evaluation Scheme

Credit : 2

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, the student will be able to	Blooms Taxonomy
CO1	Define the various terminologies in Programmings	Remember
CO2	Understand the concept to implement structured programming for various problem definitions	Understand
CO3	Understand devising algorithm, flowchart and implementing programs in C- languages.	Understand
CO4	Understand the problem statement and Select the most suitable constructs for writing well structured programs.	Understand
CO5	Implement real world problems of different requirements using computer Programming in C	Apply
CO6	Use modular programming concepts to solve complex problems	Apply

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
Unit 2	Operators and Expressions in C	

	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
Unit 3	Decision Making and Branching Statements	
	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		
Unit 4	Decision Making and Looping	
	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
Unit 5	Arrays	
	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
Unit 6	User Defined Function	
	Introduction, Need for User-defined functions, A multifunction program/Modular 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

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1			2				1	1							
CO2	2	1					1								
CO3	2	1	2	1	1	1						1			
CO4	2	2	2	2	1	1	1					1			
CO5	3	2	2	2	1	1	1					1			
CO6	1	1	2	3	1	1	1					1			

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/

FY110 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		
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	Blooms Taxonomy
CO1	Evaluate the resultant force and moment for a given system of forces.	Knowledge
CO2	Determine the support reactions for a given system of forces.	Evaluation
CO3	Calculate the support reactions for a given beams.	Analysis
CO4	Determine the centroid of the different cross sections in civil and mechanical engineering.	Analysis
CO5	Determine the second moment of area of the different cross sections.	Application
CO6	Understand impact properties of material.	Understand

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	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, Varignon’s Theorem, Law of Moments.	5

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_rjLjv-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

FY111 BASIC MECHANICAL ENGINEERING

Lectures : 2 Hrs/Week

Evaluation Scheme

Credit : 2

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	Blooms Taxonomy
CO1	demonstrate the knowledge of basic concepts and derivations in thermodynamics.	Knowledge, Application
CO2	solve problems based on applications of first law of thermodynamics and belt drives.	Knowledge, Application
CO3	summarize the working of energy converting and power transmission devices.	Knowledge, Application
CO4	explain the principles, construction and working of various power plants.	Knowledge, Application
CO5	illustrate the understanding of basic manufacturing processes.	Knowledge, Application
CO6	identify and list the mechanical engineering applications in industries.	Knowledge Understanding

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, Limitations of First Law (Numerical Treatment)	0 5 Hrs
Unit 2	Introduction to I C Engine	
	Classification, Construction and Working of C.I. and S.I. Two stroke, Four Stroke Cycles.	04 Hrs
Unit 3	Introduction to Refrigeration and Air Conditioning	
	Applications of Refrigeration & air conditioning Refrigerant types and properties, Vapour compression system, vapor absorption system, Window Air Conditioning. (Descriptive Treatment only).	04 Hrs
Section – II		
Unit 4	Energy Sources and power plants	
	Renewable and nonrenewable, Photovoltaic cell Wind Power plant, Hydropower plant, Steam Power plant , Bio-gas, Bio-Diesel (Descriptive Treatment only).	04 Hrs
Unit 5	Mechanical Power Transmission and Energy conversion devices	
	Type of Belt and belt drives (Descriptive Treatment only), chain drive, Types of gears and gear Trains, Construction, working and applications of centrifugal Pump, Construction, working.	04 Hrs
Unit 6	Manufacturing Processes	
	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

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1	3	1					1		1	1		1			
CO2	3	2					1		2	1		2			
CO3	2	1					1		2	1		2			
CO4	2						1		2	1		1			
CO5	2						1		1	1		1			
CO6	2						1		1	1		2			

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, 4 th 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/

FY202 Soft Skills

Lectures : 01 Hrs/Week

Evaluation Scheme

Credit : 01

ISE : 50 Marks

ESE : NA

Course Objectives: The objective of the course is to		
1) make students conscious about Recruitment procedure and ethics at workplace 2) inculcate the importance of Behavioral Skills in day to day communication 3) enhance the writing skills with technical report writing practice 4) prepare students to deliver speeches of various types / occasions		
Course Outcomes:		
COs	At the end of successful completion of the course, the student will be able to	Blooms Taxonomy
CO1	Understand the procedure of recruitment drive	Understand
CO2	Prepare technical reports for variety of purposes	Evaluate
CO3	Deliver prepared speeches to express ideas, thoughts and emotions	Apply
CO4	Make use of interpersonal skills in different scenario.	Apply

Description:		
<p>Soft Skills course has correlation with the Sem- I course Professional Communication. After learning the basics of language in the first semester, this course concentrates on the personality development, interpersonal skills and expectation from an industry. The included models in the syllabus have the direct correlation with employability of the students. This course would boost personality and interpersonal skills of the learners.</p>		
Prerequisites:	1:	Basic knowledge of English
	2:	Basic English Vocabulary
Unit 1	Recruitment and Career Skills	
	Importance of Planning and Managing Career Job Application and Resume/CV/Bio data Group Discussion Mock Personal Interview Corporate Etiquettes & Manners	03 Hrs
Unit 2	Behavioral Skills	
	Understanding Self: Self Esteem Personality Types and Traits Time Management & Stress Management Positive Attitude Building Emotional Intelligence	05 Hrs

Unit 3	Technical Writing Skills	
	Importance and Objectives of Technical Writing Structure and Types of Reports (Investigation and Accident Report) Corporate Email Writing: Dos & Don'ts	04 Hrs
Unit 4	Developing Presentation Skills	
	Techniques of Public Speaking Speeches for Various Occasions: Welcome Speech, Introduction of a Guest, Vote of Thanks	02 Hrs

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1						2	2					2			
CO2							2								
CO3						2	2								
CO4						2	2			2		2			
CO5															
CO6						2	2					2			

References:

Recommended Books:	
1)	Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)
2)	Communication Skills by Meenakshi Raman and Sangeeta Sharma, Oxford University Press 2016 1 st Edition
3)	Lesikar, R. V. and Pettit, J., D. Basic Business Communication, McGraw-Hill International Edition, Singapore 10 th Edition, 2006
4)	Managing Soft Skills for Personality Development by B.N. Ghosh, Tata McGraw Hill, 2012.
5)	Bikram K. Das, Kalyani Samantray, "An Introduction to Professional English and Soft Skills" Cambridge University Press New Delhi.
6)	Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English. Cambridge: Cambridge University Press. (Reprint)
7)	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, 5 th Edition, 2017
8)	Business Correspondence & Report-writing by R.C.Sharma & Krishna Mohan, Tata McGraw-Hill Education
9)	Dr. Abha Singh, "Behavioural Science" Wiley India Pvt.Ltd
10)	Soft Skills by K. Alex, S. Chand and Company, 2013

Web Links/ Video Lectures

Sr. No	Unit No.	Web Links/ Video Lectures
1	1	https://cvdesign.mobi/ https://zety.com/cv-maker https://www.javatpoint.com/group-discussion https://www.themuse.com/advice/interview-questions-and-answers
2	2	https://www.verywellmind.com/what-is-self-esteem-2795868 https://managementhelp.org/personalproductivity/time-stress-management.htm https://www.helpguide.org/articles/mental-health/emotional-intelligence-eq.htm
3	3	https://www.mindtools.com/CommSkill/EmailCommunication.htm
4	4	https://business.tutsplus.com/tutorials/effective-public-speaking-skills-techniques--cms-30848

FY102 T- ENGINEERING CHEMISTRY 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) study the different water quality parameters and its determination. 2) detect amino acids – Ninhydrin, xanthoproteic, sodium nitro preside , Pauly’s diazo test 3) understand the structural and functional role of biomolecules essential for cellular reactions. 4) study polymerization reactions and Preparation of urea-formaldehyde resin 5) develop an interest among the students regarding applied and engineering chemistry. 6) analyze characteristics of fuels and Determination of moisture, volatile and ash content in coal sample		
Course Outcomes:		
COs	At the end of successful completion of the course, the student will be able to	Blooms Taxonomy
CO1	Recall the terms, water quality parameters for pollution control.	Remember
CO2	Utilize the knowledge of cell boilogy	Analyze
CO3	Apply Knowledge of advanced materials in various engineering fields.	Apply
CO4	Select proper fuels for domestic , and industrial applications	Apply
CO5	Analyze. apply the significance of corrosion in industries	Analyze
CO6	Explain separation of components by paper chromatography	Understand

Description:		
This course aims to impart analysis of water, fundamental knowledge of engineering materials (composite, polymer Cement), and applied knowledge of biomolecules, analysis of fuel, energy storage devices, prevention techniques of corrosion. Students will be expected to communicate knowledge to society and industry.		
Prerequisites:	1:	Students should have knowledge about water quality parameters , and occurrence of metals,
	2:	periodic table physical and chemical properties of elements
	3:	Applications of fuel ,different macromolecules and its importance.

Number	Practical/ Experiment/Tutorial Topic	Hrs.	Cognitive levels of attainment as per Bloom's
1	Determination of acidity of water	2	Knowledge
2	Determination of total alkalinity of water sample.	2	Knowledge
3	Determination of chloride content of water by Mohr's method.	2	Application
4	Determination of temporary and permanent hardness of water sample by EDTA method.	2	Analysis
5	Determination of moisture, volatile and ash content in a given coal sample by proximate analysis	2	Knowledge
6	Preparation of urea-formaldehyde resin	2	Analysis
7	Preparation of phenol-formaldehyde resin	2	Analysis
8	Determination of percentage of copper in brass by iodometry.	2	Evaluate
9	Estimation of zinc in brass solution	2	Analysis
10	Determination of rate of corrosion of aluminium by weight loss method in acidic and basic medium	2	Application
11	Detection of amino acids – Ninhydrin, xanthoproteic, sodium nitro preside , Pauly's diazo test	2	Analysis
12	Demonstration of paper chromatography	2	Analysis

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1	3	---	---	---	---	---	---	---	---	---	---	1			
CO2	3	1	---	---	---	---	---	---	---	---	---	1			
CO3	3	---	---	---	2	---	---	---	---	---	---	1			
CO4	3	1	---	---	---	---	---	---	---	---	---	1			
CO5	---	---	---	---	---	--	--	--	--	--	--	2			
CO6	--	1	---	---	---	--	---	--	--	--	--	1			

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
Reference Books	
1	Engineering Chemistry by Jain and Jain, DhanpatRai Publishing Company Ltd., New Delhi
2	A Textbook of Engineering Chemistry by C. P. Murthy, C. V. Agarwal and A. Naidu, BS Publications, Hyderabad

Lab 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>

FY201T-ENGINEERING MATHEMATICS – II TUTORIAL

Tutorial/Practical : 1 hr/week

Credit : 1

Evaluation Scheme

ISA : 25 Marks

POE : NA

Course Objectives: The objective of the course is to

. Model a real life scenario into differential equations and solve them analytically and numerically

. Learn different methods of solving improper and multiple integral.

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to	Blooms Taxonomy
CO1	Solve linear and nonlinear ordinary differential equations of order one and find orthogonal trajectory.	Knowledge, Application
CO2	Find numerical solutions of ordinary differential equations of first order and first degree.	Knowledge
CO3	Compute double and triple integrals.	Knowledge
CO4	Find area, mass of plane lamina using double integral.	Application
CO5	Evaluate definite integrals using Gamma and Beta functions.	Evaluation
CO6	Solve definite integral numerically.	Knowledge

Description:

Engineering Mathematics-II 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) Differential equation of first order first degree

and Applications, ii) Numerical Solution of Differential Equation of order one degree One, iii) Integral

Calculus, iv) Numerical Integration, v) Multiple Integrations and vi) Application of Multiple Integrals

Prerequisites:	1:	Trigonometric identities and Logarithmic identities
	2:	Differentiation and integration formulae
	3:	Shapes of basic curves like circle, parabola, ellipse, straight line.

Tutorials

Number	Practical/Experiment/Tutorial Topic	Hrs.	Cognitive levels of attainment as per Bloom's
1	Exact and reducible exact differential equation	2	Knowledge
2	Linear, reducible to linear diff equation and Applications	2	Knowledge, Application
3	Evaluation of double and triple integration	2	Knowledge
4	Change of order of integration	2	Knowledge
5	Area by double integral, Mass of Lamina	2	Knowledge, Application
6	Gamma function and Differentiation under integral sign	2	Knowledge
7	Beta functions and properties	2	Knowledge
8	Euler and Eulers modified method	2	Knowledge
9	Taylor series and Runge Kutta of order four	2	Knowledge
10	Trapezoidal and Simpson (1/3) rule Simpsons (3/8)th and Weddles rule	2	Knowledge

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1	2	1													
CO2	2	1													
CO3	2	1													
CO4	2	1													

References:

TextBooks	
1	Higher Engineering Mathematics, Dr. B. S. Grewal, S. Chand and Company, 40th Edition.
ReferenceBooks	
1	Advanced Engineering Mathematics”, H. K. Das, S. Chand Publication, 8th Edition.
2	A Text Book of Applied Mathematics”, Vol. I and II, P. N. Wartikar and J. N. Wartikar, Vidyarthi Griha Prakashan, Pune.
3	A textbook of Engineering Mathematics, N. P. Bali, Iyengar, Laxmi Publications (P) Ltd, New Delhi
4	Advanced Engineering Mathematics, Erwin Kreyszig, Wiley India Pvt. Ltd

FY110T - 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		
<ol style="list-style-type: none"> 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	Blooms Taxonomy
CO1	Determine the resultant of concurrent coplanar force system graphically.	Evaluate
CO2	Analyze the force the given force system.	Analyze
CO3	Verify the law of moment of given force system.	Verify
CO4	Determine the support reactions of the given beam.	Application

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

Practical

Number	Practical/ Experiment/Tutorial Topic	Hrs.	Cognitive levels of attainment as per Bloom's
1	Law of polygon of forces	2	Evaluation
2	Jib crane	2	Analysis
3	Bell crank lever	2	Verification
4	Support Reactions of Beam	2	Application,
5	To find Resultant by Graphical Method	2	Knowledge
6	To find Support Reactions by Graphical Method	2	Knowledge
7	Assignment on finding Resultant	2	Evaluation
8	Assignment on Equilibrium of Sphere	2	Evaluation
9	Assignment on Finding support reactions of beam	2	Evaluation
10	Assignment on finding Centroid of given shape	2	Evaluation
11	Assignment on finding Moment of Inertia of given shape	2	Evaluation
12	Assignment on impact of elastic bodies	2	Evaluation

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1	1														
CO2		1													
CO3		1													
CO4	1														

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.

FY111T- BASIC MECHANICAL ENGINEERING Lab

Tutorial/Practical : 2 hr/week

Evaluation Scheme

Credit : 1

ISA : 25 Marks

POE : NA

Course Objectives: The objective of the course is to

1. Understand working of IC engine with the help of demo models.
2. Understand working of refrigeration and air conditioning system with equipment set-ups and models.
3. Understand the functions of power transmitting devices with the demo models.
4. Understand the working and operations of Lathe Milling and Drilling machines in machine shop

Course Outcomes:

COs	At the end of successful completion of the course, the student will be able to	Blooms Taxonomy
CO1	To impart knowledge and demonstration of the working of Various types of IC engines	Knowledge, Application
CO2	To demonstrate the working of refrigeration and air conditioning system with models.	Knowledge, Application
CO3	To demonstrate the working and functions of energy converting and power transmission devices with the help of models.	Knowledge, Application
CO4	To demonstrate the working and operations of Lathe Milling and Drilling machines in machine shop	Knowledge, Application

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.	Cognitive levels of attainment as per Bloom's
1	Demonstration of I.C. engine	2	Knowledge
2	Demonstration of Two stroke and four stroke engine	2	Knowledge
3	Demonstration of vapour compression refrigeration system and window air conditioner.	2	Knowledge, Application
4	Demonstration of Solar water heating system.	2	Knowledge, Analysis
5	Demonstration of Wind or Biogas or Hydroelectric Power Plant	2	Knowledge
6	Demonstration of types of Gears and gear trains	2	Analysis
7	Demonstration of pumps and compressor.	2	Analysis
8	Demonstration of metal joining processes	2	Knowledge, Evaluation
9	Demonstration of metal removal processes	2	Knowledge, Analysis
10	Demonstration of Steam Power Plant	2	Knowledge, Application

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1	1				2							3			
CO2	1				2							3			
CO3	1				2							3			
CO4	1				2							3			

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

FY202P Soft Skills Lab

Tutorial/Practical : 02 hr/week

Credit : 1

Evaluation Scheme

ISA : 25 Marks

POE : 25 Marks

Course Objectives: The objective of the course is to		
1) Strengthening Recruitment Skills- Group Discussion & Personal Interview		
2) inculcate the Behavioral Skills in day to day communication and corporate environment		
3) Preparing students for writing technical reports and delivering speeches on different occasions		
Course Outcomes:		
COs	At the end of successful completion of the course, the student will be able to	Blooms Taxonomy
CO1	Follow the procedure of recruitment drive	Understand
CO2	Prepare technical reports	Create
CO3	Deliver formal speeches	Apply
CO4	Use interpersonal skills with precision and competence in different scenario.	Apply

Description:	
This course is designed to differentiate between formal and informal communication and language, strategies for communicating in the workplace, using negotiation and diplomacy, and how to be a good promoter of using communication and soft skills complementing to hard skills while getting to be recruited and applying workplace etiquettes.	
Prerequisites:	1: Basic knowledge about English Vocabulary
	2: Communication in simple English

Practical

Number	Practical/ Experiment/Tutorial Topic	Hrs	Cognitive levels of attainment asper Bloom's
01	SWOC- Analysis	02	Understand
02	Group Discussion	04	Analyze
03	Debate	02	Analyze

04	Mock Interview	04	Analyze
05	Speeches for Various Occasions	02	Apply
06	Email Writing	02	Apply
07	Practice on Technical Writing	04	Apply
08	Extempore or Pep talk	02	Apply

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1						2	2					2			
CO2							2								
CO3						2	2								
CO4						2	2			2		2			

References:

Recommended Books:	
1)	Communication Skills for Engineers by S. Mishra & C. Muralikrishna (Pearson)
2)	Communication Skills by Meenakshi Raman and Sangeeta Sharma, Oxford University Press 2016 1 st Edition
3)	Lesikar, R. V. and Pettit, J. ,D. Basic Business Communication, McGraw-Hill International Edition, Singapore 10 th Edition, 2006
4)	Managing Soft Skills for Personality Development by B.N. Ghosh, Tata McGraw Hill, 2012.
5)	Bikram K. Das, KalyaniSamantray, “An Introduction to Professional English and Soft Skills” Cambridge University Press New Delhi.
6)	Comfort, Jeremy, et al. (2011) Speaking Effectively: Developing Speaking Skills for Business English. Cambridge: Cambridge University Press. (Reprint)
7)	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
8)	Business Correspondence & Report-writing by R.C.Sharma&KrishnaMohan,Tata McGraw-Hill Education
9)	Dr. Abha Singh, “Behavioural Science” Wiley India Pvt.Ltd
10)	Soft Skills by K. Alex, S. Chand and Company, 2013

Sr. No	Unit No.	Web Links/ Video Lectures
1	1	https://cvdesign.mobi/ https://zety.com/cv-maker https://www.javatpoint.com/group-discussion https://www.themuse.com/advice/interview-questions-and-answers
2	2	https://www.verywellmind.com/what-is-self-esteem-2795868 https://managementhelp.org/personalproductivity/time-stress-management.htm https://www.helpguide.org/articles/mental-health/emotional-intelligence-eq.htm
3	3	https://www.mindtools.com/CommSkll/EmailCommunication.htm
4	4	https://business.tutsplus.com/tutorials/effective-public-speaking-skills-techniques--cms-30848

FY109P Computer Programming in C Lab

Tutorial/Practical : 2 hr/week

Credit : 1

Evaluation Scheme

ISA : 25 Marks

POE : 25

Course Objectives: The objective of the course is to

- 1) understand the basics of problem solving techniques in programming perspective
- 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, the student will be able to	Blooms Taxonomy
CO1	Define and implement the various terminologies in Programming,	Apply
CO2	Understand the concept to implement structured programming for various problem definitions	Understand
CO3	Understand devising algorithm, flowchart and implementing programs in C-languages.	Understand
CO4	Understand the problem statement and Select the most suitable programming structure for writing well structured programs.	Understand
CO5	Implement real world problems of different requirements using computer Programming in C	Apply
CO6	Use modular programming concepts to solve complex problems	Apply

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.	Cognitive levels of attainment as per Bloom's
1	Write a Program to Demonstrate how to read and display the value in all Basic data type variables. Example:	2	Remember

	WAP to display the details of the Student Like: 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	Remember
3	Write a C Program to do the following using relational operators and branching statement: a. Read two integers and check they are equal or not. b. Print the greatest of Two numbers.	2	Understand
4	Write a Program to enter student marks through keyboard and find grade using the conditional operator. grades are 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	Understand
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	Understand
6	Write a C Program to demonstrate looping statements. 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	Apply
7	Write a C program to read N numbers in an integer array and print it in reverse order.	2	Apply
8	Write a C program to read N numbers in an array and display the sum of array elements.	2	Apply
9	Write a program to read two matrices and store the addition of two matrices in the third matrix.	2	Apply
10	Write a C Program to swap two numbers using call by value.	2	Apply

Mapping of POs & COs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1			2				1	1							
CO2	3	1					1								
CO3	2	1	3	1	1	1						1			
CO4	2	2	3	2	1	1	1					1			
CO5	3	2	3	2	1	1	1					1			
CO6	1	1	3	2	1	1	1					1			

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/>

FY112T Inquisitive learning

Teaching Scheme:**Practical's:** 2 hrs per week**Credits:** 1**Evaluation Scheme:****ISA:** 50 Marks

Course Objectives: The objective of the course is to		
1. Inculcate independent learning by problem solving with social context.		
2. Get opportunity to work in a group, so as to develop team skills and learn Professionalism.		
3. Participate in research and development activities to provide sustainable solutions.		
Course Outcomes:		
Cos	At the end of successful completion of the course the student will be able to	Blooms Taxonomy
CO1	Inquisitive learning will increase their capacity and learning through shared cognition.	Understanding
CO2	develop engineering research ability & project management skill	Applying
CO3	Sensitive towards ethical, societal & environmental issue along with professional work	Analyzing

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			

Co & PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	If applicable		
													PSO1	PSO2	PSO3
CO1	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-
CO2	2	1	1	1	1	-	-	-	-	-	1	1	-	-	-
CO3	-	2	-	-	-	2	1	1	1	-	-	-	-	-	-

FY203A Water Management

Course Objectives: The objective of the course is to		
<ol style="list-style-type: none"> 1) develop understanding of water resources 2) study global water cycle and factors that affect this cycle. 3) analyze the process for water resources and management. 4) study the research and development areas necessary for efficient utilization and management of water resources. 		
Course Outcomes:		
Cos	At the end of successful completion of the course the student will be able to	Blooms Taxonomy
CO1	Understand the global water cycle and its various processes.	Understanding
CO2	Understand climate change and their effects on water systems	Understanding
CO3	Understand Drinking treatment and quality of groundwater and surface water	Understanding
CO4	Understand the Physical, chemical, and biological processes involved in water treatment and distribution	Understanding

Description:		
<p>Water is a vital resource for all life on the planet. Only three percent of the water resources on Earth are fresh and two-thirds of the freshwater is locked up in ice caps and glaciers. One fifth of the remaining one percent is in remote, inaccessible areas. As time advances, water is becoming scarcer and having access to clean, safe, drinking water is limited among countries. Pure water supply and disinfected water treatment are prerequisites for the well-being of communities all over the world. One of the biggest concerns for our water-based resources in the future is the sustainability of the current and even future water resource allocation. This course will provide students a unique opportunity to study water management activities like planning, developing, distributing and optimum use of water resources. This course covers the topics that management of water treatment of drinking water, industrial water, sewage or Wastewater, management of water resources, management of flood protection.</p>		
Prerequisites:	1:	Nil

Unit 1	Understanding ‘water’-Climate change and the global water cycle, understanding global hydrology	
Unit 2	Water resources planning and management-Water law and the search for sustainability: a comparative analysis, Risk and uncertainty in water resources planning and management	
Unit 3	Agricultural water use -The role of research and development for agriculture water use Urban	
Unit 4	water supply and management - The urban water challenge, Water sensitive urban design	

Reference Books	
1	R. Quentin Graft, Karen Hussey, Quentin Graft, Karen Hussey, Publisher, "Water Resources Planning and Management", Cambridge University Press, ISBN: 9780511974304, 9780521762588.
2	P. C. Basil, "Water Management in India", ISBN: 8180690970, 2004.
3	C.A. Brebbia, "Water Resources Management", ISBN: 978-1-84564-960-9, 978-1-84564-961-6.