

ANNA UNIVERSITY : : CHENNAI – 600 025

UNIVERSITY DEPARTMENTS

R - 2008

B.E. AGRICULTURE AND IRRIGATION ENGINEERING

I & II SEMESTERS CURRICULUM AND SYLLABI

SEMESTER - I

CODE NO.	COURSE TITLE	L	T	P	C
THEORY					
HS9111	Technical English - I	3	1	0	4
MA9111	Mathematics - I	3	1	0	4
PH9111	Engineering Physics	3	0	0	3
CY9111	Engineering Chemistry	3	0	0	3
GE9111	Engineering Graphics	2	0	3	4
GE9112	Fundamentals of Computing	3	0	0	3
PRACTICAL					
PH9112	Physics Laboratory	0	0	2	1
CY9112	Chemistry Laboratory	0	0	2	1
GE9113	Engineering Practices Laboratory	0	0	3	2
GE9114	Computer Practices Laboratory	0	0	3	2
	TOTAL	17	2	13	27

SEMESTER II

CODE NO.	COURSE TITLE	L	T	P	C
THEORY					
HS9161	Technical English - II	2	0	2	3
MA9161	Mathematics - II	3	1	0	4
PH9163	Physics for Agricultural Engineering	3	0	0	3
CY9161	Chemistry for Civil Engineering	3	0	0	3
GE 9151	Engineering Mechanics	3	1	0	4
CE9152	Construction Materials	3	0	0	3
EE9161	Basic Electrical and Electronics Engineering	3	0	0	3
PRACTICAL					
GE9161	Unix Programming Laboratory	0	0	4	2
CE9153	Construction Materials Laboratory	0	0	3	2
	TOTAL	20	2	8	27

HS 9111	TECHNICAL ENGLISH I	L T P C
	(Common to all branches of B.E. / B.Tech. Programmes)	3 1 0 4

AIM:

To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

OBJECTIVES:

- To enable students improve their vocabulary and employ the words appropriately in different academic and professional contexts.
- To make students comprehend classroom lectures and technically oriented passages.
- To enable students develop suitable reading strategies that could be adopted while reading science related texts.
- To enable students acquire the ability to speak effectively in English in real life situations and work-related situations.
- To train students in academic and professional writing.

UNIT I 9+3

Vocabulary - using words in context - use of suffixes to form nouns from verbs and adjectives – adjectives, adverbs - matching words with meanings - Active and passive voices – tenses - simple present, present continuous - comparative adjectives – adverbial forms - Reading text: skimming for general information - specific details - note making - cloze reading – Listening and transferring of information from text to graphic forms - bar charts, flow-charts - Paragraph writing - descriptions using descriptive words and phrases - organising information - Role play - conversational techniques – discussions - oral reporting.

UNIT II 9+3

Vocabulary items - words with prefixes (“multi-“, “under-“) - Asking and answering questions, error correction - spelling and punctuation - Reading Comprehension - scanning for information – inferring meaning from context - Listening and guided note-taking - paragraph writing - using notes – giving suitable headings / subheadings for paragraphs – Comparing and contrasting using expressions of comparison - Discussion using creative ideas

UNIT III 9+3

Compound nouns - negative prefixes – antonyms – Use of modal verbs – making sentences using phrases – tenses – simple past and present perfect - Reading and guessing meanings in context - Listening and note taking - Channel conversion from text to chart - Writing comparisons - making recommendations - coherence using discourse markers - Discussion - role-play (explaining and convincing)

UNIT IV 9+3

Expanding nominal compounds – words with multiple meanings – Error correction - prepositions - use of the prefix “trans-“ - compound adjectives - modal verbs to express

probability - simple past and present perfect - Reading – prediction of content - understanding advertisements - scanning the text and comprehension check - Listening for details - Writing definitions – expression of use and purpose - Role-play – discussion - speculating about the future

UNIT V

9+3

Formation of nouns, verbs and adjectives from root words – some useful phrases and expressions - cloze exercises - 'If' conditional clauses – gerunds (verbal nouns) - Reading for comprehension - intensive reading - Accuracy in listening – listening to discussion on specific issues - Group discussion - role-play (stating, discussing problems and proposing solutions) - Planning a tour - Writing an itinerary - Writing formal letters - letter to the editor

LECTURE – 45 TUTORIAL – 15 TOTAL – 60 PERIODS

TEXTBOOKS

1. Department of Humanities and Social Sciences, Anna University, **English for Engineers and Technologists**, Vol. I and II (Combined Edition), Orient Longman, Pvt. Ltd., 2006. Themes 1 to 4.

REFERENCES

1. Day, R.A, Scientific English, Second Edition, Hyderabad: Universities Press, 2000.
2. Mitra, B.K, Effective Technical Communication: A Guide for Scientists & Engineers, New Delhi: Oxford University Press, 2006.
3. Website: www.uefap.co.uk

MA 9111

MATHEMATICS – I

L T P C

(Common to all branches of B.E. / B.Tech. Programmes) 3 1 0 4

AIM:

To make available the basic concepts of engineering mathematics, to prepare the student for new concepts to be introduced in the subsequent semesters and to provide the necessary mathematical skills that are needed in modeling physical processes by an engineer.

OBJECTIVES:

- To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
- To make the student knowledgeable in the area of infinite series and their convergence so that he/ she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling
- To familiarize the student with functions of several variables which is needed in many branches of engineering
- To introduce the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications

TEXT BOOKS:

1. Palanisamy, P.K., Engineering Physics, Scitech Publications (P) Lt, 2006.
2. Arumugam, M., Engineering Physics, Anuradha Publ., 2000.

REFERENCES:

1. Gaur R.K., and Gupta, S.L Engineering Physics, Dhanpat Raj Publ., 2003.
2. Sankar B.N., Pillai.S.O., Engineering Physics, New age International (P) Ltd, 2007

CY9111	ENGINEERING CHEMISTRY	L	T	P	C
	(Common to all branches of Engineering and Technology)	3	0	0	3

AIM:

To gain a sound knowledge of thermodynamics, phase rule, surface chemistry and catalysis, basic organic reaction mechanisms and principles and applications of spectroscopy and nanochemistry.

OBJECTIVES:

To make the student conversant with the

- Applications of second law of thermodynamics.
- Phase rule and various types of alloys
- Surface chemistry and its importance in adsorption and catalysis.
- Basic principles in organic reaction mechanisms and principles and applications of spectroscopy
- Nanochemistry and its applications

UNIT I THERMODYNAMICS 9

Statement of second law of thermodynamics – Clausius and Kelvin – definition of entropy – entropy change for a reversible process – entropy change for flow of heat in an irreversible process – entropy change for an isothermal expansion of an ideal gas – problems – entropy of phase transitions- problems – definition of free energy and work function – Gibbs Helmholtz equation – applications – problems – derivation of Maxwell relations – van't Hoff isotherm and isochore – applications – problems – chemical potential – variation of chemical potential with temperature and pressure - significance.

UNIT II PHASE RULE 9

Phase rule – statements and explanation of the terms involved – condensed phase rule – construction of phase diagram – water system – sulphur system – phase rule for two component alloy systems- thermal analysis – eutectic system - Lead-Silver system – simple eutectic formation – Zinc-Magnesium alloy system – Iron-Carbon alloy system- solved examples.

UNIT III SURFACE CHEMISTRY AND CATALYSIS 9

Adsorption – types of adsorption – adsorption of gases on solids – adsorption isotherm – Freundlich and Langmuir isotherms – adsorption of solutes from solutions – applications – role of adsorption in catalytic reactions – ion exchange adsorption – basic principles in adsorption chromatography – Catalysis – classification – characteristics of catalysis - auto catalysis – enzyme catalysis – Michaelis – Menton equation – solid acid catalysis.

UNIT IV ORGANIC REACTIONS AND SPECTROSCOPY 9

Electrophilic and nucleophilic, substitution and elimination reactions mechanisms – SN^1 , SN^2 , E^1 , E^2 reactions – Electromagnetic spectrum – absorption of radiation – electronic transition – vibrational transition – rotational transition – intensities of spectral lines – Beer-Lambert's law – type of instrument used for absorption measurements – UV & visible spectroscopy, IR spectroscopy – principles of instrumentation and applications.

UNIT V NANO CHEMISTRY 9

Introduction to nanochemistry – preparations and properties of nanomaterials - nanorods – nanowires – nanotubes – carbon nanotubes and their applications – nanocomposites – sensors and electronic devices – nanochemistry in biology and medicines – nanocatalysis.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Puri B.R., Sharma L.R. and Madhan S. Pathania, Principles of Physical Chemistry, Shoban Lal Nagin Chand & Co. Jalandar –2000.
2. Jain P.C. and Renuka Jain, Physical Chemistry for Engineers, Dhanpet Rai & Sons, New Delhi, 2001.

REFERENCES

1. Bahl B.S., Tuli G.D., and Arun Bahl, Essentials of Physical Chemistry, S. Chand & Company Ltd., New Delhi, 2004.
2. Morrison R.T., & Boyd R.N., Organic chemistry, Prentice-Hall of India Private Limited, New Delhi, 1992.
3. Sanyal S.N., Reactions, Rearrangements and Reagents Bharati Bhawan Publishers & Distributors New Delhi, 2006.
4. G. B. Sergeev, Nanochemistry, Elsevier Science, New York, 2006

GE 9111 ENGINEERING GRAPHICS L T P C
(Common to All branches of B.E. / B.Tech. Programmes) 2 0 3 4

OBJECTIVES:

To develop in students the graphic skills that would enable them to communicate the concepts, ideas and design of engineering products

To provide an exposure to the national/international standards related to technical drawings

INTRODUCTION **2**

Importance of graphics in engineering applications – use of drafting instruments – BIS specifications and conventions – size, layout and folding of drawing sheets – lettering and dimensioning

UNIT I FREE HAND SKETCHING OF ENGG OBJECTS AND CONSTRUCTION OF PLANE CURVE **3+9=12**

Pictorial representation of engineering objects – representation of three dimensional objects in two dimensional media – need for multiple views – developing visualization skills through free hand sketching of three dimensional objects.

Polygons & curves used in engineering practice– methods of construction– construction of ellipse, parabola and hyperbola by eccentricity method – Cycloidal and involute curves- construction - drawing of tangents to the above curves.

UNIT II ORTHOGRAPHIC PROJECTION: PROJECTION OF POINTS, LINES AND PLANE SURFACES **6+9=15**

General principles of orthographic projection – first angle projection – layout of views – projections of points, straight lines located in the first quadrant – determination of true lengths of lines and their inclinations to the planes of projection – traces – projection of polygonal surfaces and circular lamina inclined to both the planes of projection

UNIT-III ORTHOGRAPHIC PROJECTION: PROJECTION OF SOLIDS AND SECTIONS OF SOLIDS **6+9=15**

Projection of simple solids like prism, pyramid, cylinder and cone when the axis is inclined to one plane of projection –change of position & auxiliary projection methods- sectioning of above solids in simple vertical positions by cutting plane inclined to one reference plane and perpendicular to the other and above solids in inclined position with cutting planes parallel to one reference plane – true shapes of sections

UNIT IV DEVELOPMENT OF SURFACES AND INTERSECTION OF SOLIDS **6+9=15**

Need for development of surfaces – development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cones – development of lateral surfaces of the above solids with square and circular cutouts perpendicular to their axes. Intersection of solids and curves of intersection –prism with cylinder, cylinder & cylinder, cone & cylinder with normal intersection of axes and with no offset.

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS **4+9=13**

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones – principles of perspective projections – projection of prisms, pyramids and cylinders by visual ray and vanishing point methods.

COMPUTER AIDED DRAFTING (DEMONSTRATION ONLY) **3**

Introduction to computer aided drafting software packages and demonstration of their use.

L=30 P=45 TOTAL: 75 PERIODS

UNIT II **9**
 The internet and the WWW – Internet services – connecting to the internet - Working with applications software – productivity software – graphics and multimedia – Data base Management systems – Creating computer program.

UNIT III **9**
 C programming fundamentals – compilation process – variables – Data types – Expressions – looping – decisions.

UNIT IV **9**
 Arrays - Working with functions – structures – character strings – pre processor.

UNIT V **9**
 Pointers – Dynamic memory allocation – linked list - Applications

TOTAL: 45 PERIODS

TEXT BOOKS

1. Peter Norton, “Introduction to Computers”, Sixth Edition, Tata McGraw Hill, 2007.
2. Stephen G. Kochan, “Programming in C”, Third Edition, Pearson Education, 2007.

REFERENCES

1. Kernighan,B.W and Ritchie,D.M, “The C Programming language”, Second Edition, Pearson Education, 2006
2. Ashok N. Kamthane, “Computer programming”, Pearson Education, 2007.
3. Kenneth A. Reek, “Pointers on C”, Pearson Education, 2007.
4. Dromey,R.G, “How to solve it by Computer”, Pearson Education, 2007.

PH 9112 **PHYSICS LABORATORY** **L T P C**
 (Common to ALL Branches of B.E. / B.Tech. Programmes) **0 0 2 1**

- | | |
|--------------------------|--|
| 1. Torsional Pendulum- | Determination of rigidity modulus of wire and moment of Inertia of disc. |
| 2. Non-uniform bending - | Determination of Young’s modulus. |
| 3. Lees’ disc- | Determination of thermal conductivity of a bad conductor. |
| 4. Potentiometer | - Determination of thermo e.m.f of thermocouple |
| 5. Air wedge- | Determination of thickness of a thin sheet of paper. |
| 6. i. Optical fibre | - Determination of Numerical Aperture and acceptance angle |
| ii. Compact disc - | Determination of width of the groove using laser. |
| 7. Acoustic grating - | Determination of velocity of ultrasonic waves in liquids. |

- | | |
|--------------------------|--|
| 8. Post office box - | Determination of Band gap |
| 9. Spectrometer - | Determination of wavelength using grating |
| 10. Viscosity of liquid- | Determination of co-efficient of viscosity of a liquid by Poiseuille's flow. |

TOTAL: 30 PERIODS

CY9112	CHEMISTRY LABORATORY	L T P C
	(Common to all branches of Engineering and Technology)	0 0 2 1

I. WEIGHING AND PREPARATION OF STANDARD SOLUTIONS

- i) Preparation of molar and normal solutions of the following substances oxalic acid, sodium carbonate, sodium hydroxide, and hydrochloric acid.
- ii) Preparation of buffer solutions: borate buffer, phosphate buffer using Henderson equation.

2. WATER ANALYSIS

- i) Determination of total hardness, temporary & permanent hardness of water by EDTA method.
- i) Determination of DO content by Winkler's method.
- ii) Determination of alkalinity in a water sample.
- iii) Determination of chloride content of water sample by argentometric method.

3. PH-METRY

To find out the strength of given hydrochloric acid by sodium hydroxide.

4. CONDUCTOMETRY

- i) Conductometric titration of mixture of acids
- ii) Conductometric precipitation titration using BaCl_2 - Na_2SO_4

5. POTENTIOMETRY

- i) Redox titration – Iron Vs. dichromate

6. SPECTROPHOTOMETRY

- i) To determine λ_{max} of a colored solution such as potassium permanganate.
- ii) To determine the iron content of an unknown solution (1,10- phenanthroline/ thiocyanate method)

7. FLAME PHOTOMETRY

- i) To determine sodium and potassium in water.

8. VISCOMETRY

- i) Determination of molecular weight of a polymer

9. WATER POLLUTION

- i) COD analysis of a waste water by dichromate method.

10. KINETICS

- i) Determination of reaction rate constant of acid catalyzed hydrolysis of ester.

11. ADSORPTION

- i) Adsorption of acetic acid on activated charcoal.

TOTAL: 30 PERIODS

REFERENCE BOOKS

1. A text of quantitative Inorganic Analysis, A. L. Vogel , ELBS London. 1995.
2. Experiments in physical chemistry, D.P. Shoemaker and C.W. Gardad, McGraw Hill, London, 2001.

GE 9113

ENGINEERING PRACTICES LABORATORY
(Common to all Branches of B.E. / B.Tech. Programmes)

L T P C
0 0 3 2

OBJECTIVE

To provide exposure to the students with hands-on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP – A (CIVIL & ELECTRICAL)

1. CIVIL ENGINEERING PRACTICE

12

Plumbing

Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.

Laying pipe connection to the suction side of a pump – inlet.

Laying pipe connection to the delivery side of a pump – out let.

Practice in mixed pipe connections: Metal, plastic and flexible pipes used in household appliances.

Wood Work

Sawing, planing and making common joints: T-Joint, Mortise and Tennon joint, Dovetail joint.

Study

Study of joints in door panels, wooden furniture

Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICE 9

Basic household wiring using switches, fuse, indicator – lamp etc.,

Preparation of wiring diagrams

Stair case light wiring

Tube – light wiring

Study of iron-box, fan with regulator, emergency lamp

GROUP – B (MECHANICAL AND ELECTRONICS) 15

3. MECHANICAL ENGINEERING PRACTICE

Welding

Arc welding of butt joints, lap joints, tee joints

Gas welding Practice.

Basic Machining

Simple turning, drilling and tapping operations.

Machine assembly Practice.

Study and assembling the following:

Centrifugal pump, mixies and air conditioners.

Demonstration on

(a) Smithy operations like the production of hexagonal bolt.

(b) Foundry operation like mould preparation for grooved pulley.

4. ELECTRONIC ENGINEERING PRACTICE 9

Soldering simple electronic circuits and checking continuity.

Assembling electronic components on a small PCB and testing.

Study of Telephone, FM radio, low-voltage power supplies.

TOTAL: 45 PERIODS

GE 9114	COMPUTER PRACTICE LABORATORY	L	T	P	C
	(Common to all branches of B.E. / B.Tech. Programmes)	0	0	3	2

AIM:

The aim is to teach the use of computer applications related to office automation and to teach implementation of C programs.

OBJECTIVES:

- To introduce office automation software packages.
 - To teach the fundamentals in C programming.
1. Simple OS commands and simple editors for file operations.
 2. Word processors for more complex operations, like formatting documents, creating tables and so on.
 3. Simple data base packages for creating and manipulating databases.
 4. Spread sheet packages for data preparation and analysis.
 5. Preparation of reports involving mathematical functions (Income Tax Statement, Mark sheets, Payroll etc.,)
 6. C Programs using one dimensional arrays.
 7. C Programs using multi-dimensional arrays and pointer data types.
 8. Programs using structures, nested structures and union.
 9. Programs using functions- recursive, non-recursive and Library functions.
 10. Programs for passing aggregate data types as parameters between functions.
 11. Programs for dynamic memory allocation / deallocation.
 12. Programs for self-referential structure – Implementing linked list.

TOTAL: 45 PERIODS

HS 9161

TECHNICAL ENGLISH II
(For all branches of B.E. / B.Tech. Programmes)

L T P C
2 0 2 3

AIM:

To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

OBJECTIVES:

- To enable students develop their critical thinking skills.
- To enable students develop higher order reading skills such as interpreting, evaluating and analysing.
- To enable students develop their active listening skills.
- To enable students participate successfully in Group Discussions.

UNIT I

6

Word formation using prefixes 'self' – modified cloze – contextual meanings – Sequencing words - future simple passive form - Predicting content – Intensive reading – interpreting advertisements – Listening and completing table – Writing extended definition – describing a process using sequence words – developing ideas into paragraphs – writing about the future.

UNIT II

6

Identifying objects and their use – word puzzles using words with suffixes – Prepositions – adverbs – structures that express purpose - adjectives – group discussion – Reading - skimming for content and analysis of style – modes of non verbal communication – Listening and categorising data in tables – Writing formal letter – writing paragraphs on various issues.

UNIT III

6

Stress and intonation - Cause and effect expressions - Tense forms - simple past and past continuous - Different grammatical forms of the same word - Critical reading - guided note-making and evaluating content - Listening – guided note-taking – completing a table – Role-play – group discussion techniques - discussing an issue – offering suggestions – Sequencing jumbled sentences using coherence markers– Writing a report – Writing recommendations – Writing a letter of complaint.

UNIT IV

6

Numerical adjectives - Prepositions – use of intensifying prefixes – phrasal verbs - different grammatical forms of the same words – cloze exercise - Reading a text and evaluating the content - advertisements – analysing style and language - Listening and entering classified information – Intensive listening and completing the steps of a process - Role-play - Group discussion expressing opinions and convincing (agreeing and disagreeing) - Giving oral instructions – Descriptive writing - writing based on hints – writing argumentative paragraphs – formal letter writing – letter of application with biodata / CV Writing safety instructions - warnings and notices – preparing checklist – email communication.

UNIT V

6

Identifying problems, their causes and finding solutions using case studies – creative and critical thinking – levels of thinking – thinking strategies – brainstorming - analytical reasoning skills – evaluative essay – decision making – conflict resolution

English Language Lab

(30 Periods)

1. Listening: (10)

Recognising English sounds – accents - listening & answering questions - gap filling - listening & note making - listening to telephonic conversations - listening to speeches.

2. Speaking: (10)

Pronouncing words & sentences correctly - word stress - conversation practice.

3. Reading: (5)

Cloze test - Reading and answering questions - sequencing of sentences.

4. Writing: (5)

Correction of errors - Blogging.

TOTAL : 60 PERIODS

TEXTBOOK

1. Department of Humanities & Social Sciences, Anna University. English for Engineers and Technologists, Combined edition Vols. I & II. Chennai: Orient Longman, Pvt. Ltd. 2006, Themes 5 to 8 (for Units 1 – 4)
2. Sunita Mishra & C. Muralikrishna, Communication Skills for Engineers, Pearson Education, Second Impression, 2007. (for Unit 5)

REFERENCES

1. Ashraf, R.M, Effective Technical Communication, New Delhi: Tata McGraw Hill, 2007.
2. Thorpe, E & Thorpe, S, Objective English, New Delhi : Pearson Education, 2007.
3. Joan Van, Emden, A Handbook of writing for Engineers, Cambridge University Press, 1997
4. Website: www.englishclub.com

LAB REQUIREMENTS

1. Teacher – Console and systems for students
2. English Language Lab Software
3. Tape Recorders

transforms – Convolution theorem – Transform of periodic functions – Application to solution of linear ordinary differential equations with constant coefficients.

L: 45, T: 15, TOTAL : 60 PERIODS

TEXT BOOKS

1. Grewal, B.S. “Higher Engineering Mathematics”, Khanna Publications (2007)
2. Ramana, B.V. “Higher Engineering Mathematics” Tata McGraw Hill (2007).

REFERENCES

1. Glyn James, “Advanced Modern Engineering Mathematics, Pearson Education (2007)
2. Jain R.K. and Iyengar S.R.K., Advanced Engineering Mathematics (3rd Edition) Narosa Publications, Delhi (2007).

PH9163	PHYSICS FOR AGRICULTURE AND IRRIGATION ENGINEERING	L	T	P	C
		3	0	0	3

OBJECTIVE:

To introduce the essential principles of physics related to agriculture and irrigation engineering.

UNIT I SOIL PHYSICS 9

Soil as a dispersion three-phase system - Volume and mass relationships of soil constituents - Solid Phase - Liquid phase - gaseous phase – soil heat flow - Soil Compaction and Consolidation - The Field Soil Water Regime - Solute Transport in Soil - Methods for Analyzing Spatial Variations of Soil Properties.

UNIT II PHOTOSYNTHESIS 9

Photosynthesis - Leaves and Leaf Structure - The Nature of Light - Chlorophyll and Accessory Pigments - The structure of the chloroplast and photosynthetic membranes - Stages of Photosynthesis - The Light Reactions - Dark Reaction - C-4 Pathway - The Carbon Cycle.

UNIT III BIOPHYSICS 9

Biophysics – Biophysics methods applicable in agriculture- possibilities of application of new methods in agriculture – effects in agriculture with biophysical methods – effects of new methods applied in agriculture in protection of environment.

UNIT IV REMOTE SENSING IN AGRICULTURE AND IRRIGATION 9

Electromagnetic Spectrum: The Photon and Radiometric Quantities – radiant energy- radiant flux density – radiant intensity – transmittance – absorptance- reflectance – distribution of radiant energies- spectral signatures – sensor technology – sensor types- passive and active- spatial resolution- processing and classification of remote sensed

data – pattern recognition – approaches to data/ image interpretation - use of remote sensing in agriculture and irrigation.

UNIT V FOOD IRRADIATION AND PRESERVATION 9

Effects of ionizing radiation on biological organisms - Effects of ionizing radiation on foods – applications of Food irradiation – low dose –medium dose and high dose – Food irradiation using electron beams, X-rays – nuclear radiation.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Elements of soil Physics, P. Koorevaar, G. Menelik , C. Dirksen , Elsevier Science & Technology, 1999.
2. Electronic radiation of foods - An introduction to Technology, R.B. Miller , Springer, 2005.

REFERENCE

1. Bulgarian Journal of Plant Physiology, Special issue, 2003

CY9161 CHEMISTRY FOR CIVIL ENGINEERING L T P C
(Common to Civil, Geoinformatics and Agriculture & Irrigation Engineering) **3 0 0 3**

AIM

- To impart knowledge on the Applied Chemistry topics important in Civil Engineering Practice.

OBJECTIVES

- The students should be conversant with
- Treatment of water for domestic and industrial purpose
- The formation of polymers and their compounding into different end-use products
- Types and mechanism of corrosion and control measures
- The chemical nature of building materials and composites
- Chemistry of adhesives and their applications.

UNIT I WATER TREATMENT 8

Disadvantages of hard water in industries – conditioning methods – external treatment methods –zeolite and ion exchange methods – internal treatment (colloidal, phosphate, calgon, carbonate methods) – desalination (reverse osmosis and electro-dialysis) – requisites of drinking water – treatment of domestic water (screening, sedimentation, coagulation, filtration, disinfection – by chlorination, UV treatment, ozonization).

UNIT II POLYMER CHEMISTRY 9

Monomers – functionality – polymer – degree of polymerization – classification based on source and applications – effect of polymer structure on properties – addition, condensation, co-polymerization and co-ordination polymerization – mechanism of addition – polymerization (free-radical mechanism) thermosetting and thermoplastics resins – preparation, properties and applications of polythene, polypropylene, TEFLON, polystyrene, polyvinyl chloride, PMMA, polyamides, polyesters, bakelite, epoxy resins, vulcanization of rubber – rubber blended plastics – laminated plastics – laminated glass – thermocole.

UNIT III CORROSION AND CORROSION INHIBITION 9

Corrosion – causes of corrosion – principles of chemical corrosion – Pilling – Bedworth rule – principles of electrochemical corrosion – difference between chemical and electrochemical corrosion – factors influencing corrosion – types of corrosion – galvanic corrosion – differential aeration corrosion – stress corrosion – soil corrosion – pitting corrosion, water line corrosion – corrosion control – cathodic protection – sacrificial anode – selection of materials and proper designing – corrosion inhibitors, protective coatings – paints – constituents – functions – mechanism of drying – varnishes and lacquers – special paints – fire retardant, water repellent, temperature indicating and luminous paints.

UNIT IV CHEMISTRY OF BUILDING MATERIALS 10

Cement – chemical composition – setting and hardening – concrete – weathering of cement and concrete and its prevention- special cements – high alumina cement, soral cement, white Portland cement, water proof cement – lime – classification – manufacture, setting and hardening – refractories – requisites –classification – common refractory bricks – preparation, properties and uses of silica bricks, high alumina bricks, magnesite bricks, carbon bricks, zirconia bricks and carborundum – composites – definition of composites – characteristics – constituents of composites – types – fibre reinforced plastic (FRP) – metal matrix composites (MMC) – ceramic matrix composites (CMC) – properties and applications.

UNIT V ADHESIVES 9

Definition – adhesive action – development of adhesive strength – physical and chemical factors influencing adhesive action – bonding process of adhesives – adhesives for building & construction: animal glues, casein glues, phenol formaldehyde resins, polyurethane, epoxy resins, urea formaldehyde

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Jain P.C. and Monica Jain, Engineering Chemistry, Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2002.
2. Dara.S.S., A Textbook of Engineering Chemistry, S.Chand & Company Ltd., New Delhi, 2003.

REFERENCES:

1. Nanjundan, S. and Sreekultan Unnithan, C., Applied Chemistry, Sree Lakshmi Publications, Chennai, 2001.
2. Sadasivam, V., Modern Engineering Chemistry – A Simplified Approach, Vol.I, Kamakya Publications, Coimbatore, 2003.

2. Del Toro, "Electrical Engineering Fundamentals ", Prentice Hall of India Pvt.Ltd. New Delhi, Second Edition.

REFERENCES

1. V.K.Mehta, Principle of Electronics, S.Chand and Company Limited, 1994.
2. Deshpande, N.V., "Electrical Machines "A.A.Wheeler and Co. Ltd., New Delhi, 1994.
3. Grob, B., and Schultz., M.E. Basic Electronics, Tata Mc Graw Hill, 2003
4. Thomas L.Floyd, Electronic Devices, Pearson Education, 2002
5. Malvino, Electronic Principles, Mc Graw Hill, 1993
6. Thomas L. Floyd, Digitals Fundamentals, Pearson Education, 2003

GE 9161

UNIX PROGRAMMING LAB

L	T	P	C
0	0	4	2

AIM:

The aim is to introduce working in UNIX environment.

OBJECTIVES:

- To introduce the basic commands in UNIX.
 - To teach UNIX shell programming.
 - To introduce programming in C with UNIX system calls.
1. Basic Unix commands
 2. Simple editors for file operations.
 3. Filters-Grep, sed, awk
 4. Simple shell programming.
 5. Shell programming using complex control structures.
 6. C Programs using file system related system calls.
 7. C Programs using process related system calls.
 8. Programs for inter process communication using pipes, FIFOs.
 9. Programs using signals.
 10. Programs using shared memory.

TOTAL: 60 PERIODS

TEXT BOOK

1. Brain W. Kernighan and Rob Pike, "The programming Environment", PHI, 2002.

UNIT I TEST ON STONES

Texture- Density - Compressive Strength-Modulus of Rupture-Abrasion Resistance- Water Absorption

UNIT II TEST ON BRICKS

Compressive Strength – Water Absorption – Efflorescence

UNIT III TEST ON CEMENT

Specific gravity – Soundness – Consistency and Setting Times – Vicat – Le Chatelier's and Blain's apparatus

UNIT IV TEST ON AGGREGATES

Grading of aggregates – Finess modulus- Loose and compacted bulk density – Specific gravity – Crushing Strength – Impact Resistance – Abrasion – Flakiness Index and Elongation Index

UNIT V TEST ON CONCRETE

Slump cone – Flow table – Cube and cylinder strength – Modulus of Rupture, Ve bee apparatus, Compaction factor

TOTAL: 45 PERIODS

REFERENCE

1. Relevant IS Codes