JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III Year B.Tech. Ag. Engg.-I Sem

L	T/P/D	C
4	-/-/-	4

(A50327) THERMODYNAMICS AND REFRIGERATION SYSTEMS

Objective: To enable the students to know about the thermodynamic laws and principles, gas laws and different cycles and their efficiencies for efficient designs of heat engines, Refrigerator systems in general and Farm engines and cold storages in particular.

Unit – I:

Introduction to thermodynamic Thermodynamic system, boundary, surroundings, Classification of Thermodynamic system, Closed system-open system-isolated system, Laws of conservation of energy, heat, work, Definition of thermodynamic work and example of work, Thermodynamic properties, classification of thermodynamic systems. Laws of thermodynamic – first law, second law and zeroth law, Gas laws-Boyless' law Charles law Guy–lussac law, Thermodynamic properties of perfect gases.

Unit-II

Application of first law in heating and expansion of gases, Cycles-introduction-Applications, Carnot theorem-Carnot cycle, Entropy-introduction-physical concept of entropy, Change of entropy of gases in thermodynamics, Generation of steam-terms used latent heat, sensible heat, total heat of System, Classification of boilers, Explanation of Lancashire boiler, Explanation of locomotive boiler, Explanation of Babcock-Wilcox boilers, Boiler mounting and accessories.

Unit - III

Heat engines, Classification, Components, Working principles- Working cycle of 4- stoke and 2-stroke diesel and Petrol Engines, Comparison between 4 stroke and 2-stroke Diesel and Petrol Engines, Air standard cycle-efficiencies, Explanation of other engine efficiencies and terms, Explanation of Otto cycle-thermal efficiency equations, Explanation of diesel cycle and dual cycle, Calculation of efficiencies, Mean effective pressure and their comparison, Measurement of indicated horse power, brake horse power, Heat balance calculations, Problems on IP, BP, Engine efficiencies and performances

Unit-IV:

Principles of refrigeration- Definition of refrigeration, second law of thermodynamics, background, major uses and applications, Principles of refrigeration – Room air conditioner, domestic refrigerator, working substances in refrigeration machines, unit of refrigerating capacity, coefficient of performance, problems on refrigeration capacity, Production low

temperatures- Expansion of a liquid with flashing, reversible adiabatic expansion of a gas, irreversible adiabatic expansion (throttling) of a real gas, thermoelectric cooling, adiabatic demagnetization. Refrigeration machine, heat engines, Air refrigerators working on reverse Carnot cycle-Carnot cycle, reversed Carnot cycle, selection of operating temperatures, Problems on reverse Carnot cycle and selection of operating temperatures, Air refrigerators working on Bell Coleman cycle- Reversed Brayton or joule or Bell Coleman Cycle, Analysis of gas cycle, polytropic and multistage compression, Problems on Bell Coleman cycle, Vapour refrigeration – Vapor as a refrigerant in reversed Carnot cycle with P.V. and T s diagrams, problems on reversed Carnot cycle with vapour, gas as a refrigerant in reversed Carnot cycle, limitations of reversed Carnot cycle.

Unit-V:

Vapour compression systems –Modifications in reverse Carnot cycle with vapour as refrigerant (dry Vs wet compression, throttling Vs isentropic expansion), Vapor compression cycle, vapor compression system calculations, Vapor compression cycle – Representation of vapor compression cycle on pressure- enthalpy diagram, super heating, sub cooling, problems on vapour compression cycle, Liquid-vapour regenerative heat exchanger for vapour compression system, effect of suction vapour super heating, sub cooling, problems on vapour compression cycle, Vapour-absorption refrigeration system – Process, calculation, maximum coefficient of performance of a heat operated refrigerating machine, problems on vapour absorption refrigerating system, common, refrigerant-absorbent systems. Common refrigeration and their properties, Cold storage- Cold storage, controlled atmosphere storage, factor affecting refrigerated cold storage, hypobaric storage, Thermodynamic properties of moist air, perfect gas relationship for approximate calculation, adiabatic saturation process, ideal gas law, Amagat's law, Dalton's law, Psychometric chart –Saturation pressure, absolute humidity, percentage humidity, humid volume, total heat, enthalpy, adiabatic processes, wet bulb temperature and its measurement, psychometric chart and its use. Psychometric processes- state factor, cooling, heating, mixtures, dehumidifying, drying, air conditioning.

TEXT BOOKS:

1. Engineering Thermodynamics, Nag PK 1995, Tata Mc Graw Hill Publishing Co., Ltd., 12/4 Asaf Ali Road, New Delhi.
2. Refrigeration and Air conditioning, C P Arora.

REFERENCES:

1 A Course in Thermodynamics and Heat Engines, Kothandaraman C.P Khajuria PR and Arora SC 1992. Dhanper Rai and Sons, 1682 Nai Sarak, New Delhi

2 Engineering Thermodynamics, Khurmi R S 1992 S Chand and Co. Ltd Ram Nagar, New Delhi.

3 Thermodynamics and Heat Power Engineering, Mathur ML and Mehata fs 1992 Dhanpat Rai and Sons 1682 Nai Sarak, New Delhi

4 Thermal Engineering, Ballney PL 1994, Khanna Publishers, New Delhi

5 Refrigeration and Air Conditioning, R. K. Rajesh

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(A53010) SOIL AND WATER CONSERVATION ENGINEERING

Objective: To enable the students to acquire knowledge on different soil laws estimation models, run off estimation by rational, curve number, cook's etc. Land use, capability classification, Land treatment works like contour bunding, terracing, bench terraces, contour trenches and their types and complete design calculations. Also to enrich the students and familiarize the students in the design of various gully control structures, temporary and permanent, their designs with a due importance to hydrologic, hydraulic and structural phases of design.

Unit- I:

Introduction – Soil and Water conservation research centre–Its sub-centers in India–Soil Erosion–Geologic, Accelerated types. Causes and agents of erosion – Factors affecting erosion – Different stages of erosion – Rill – Sheet – Gully and Ravines-Water Erosion–Forms of water erosion–Mechanics of Erosion – Gullies and their classification, stages of gully development. Soil Loss estimation–Universal Soil Loss equation and modified soil loss equation, expansion of various terms – Estimation of their various parameters.

Unit–II:

Wind Erosion – Factors affecting wind erosion, mechanics of wind erosion, soil loss estimation, Wind erosion control measures – Vegetative, mechanical measures, wind blades and shelter belts, sand dunes stabilization – Wind erosion and its control. Runoff – Factors affecting runoff – Runoff – Peak Runoff and design peak runoff – its estimation - Rational method – Time of concentration estimation – Curve number method – Cook's method. Land use capability classification based on different criteria with a special reference to slope – Erosion control measures – Agronomic and mechanical or engineering measures.

Unit – III

Contour bunds – Design of contour bunds – Horizontal interval – Vertical interval – Cross Section of the contour bunds – Seepage line consideration. Determination Height of Bund – Loss of Area due to bunding. Design of waste weir – Construction of contour bunds in fields. Graded bunds – Design of graded bunds. Introduction to Conservation Ditching.

Unit-IV:

Terraces – Classification of Terraces-Design of narrow based and broad based terraces. Bench Terraces – Types of Bench Terraces – Derivation for

an equation for finding of vertical interval –Design of bench terraces. Contour trenching – Staggered and continuous trenche – Adaptability and types. Vegetated water ways – Types of water ways based on shapes – Expression for wetted perimeters – Areas – Hydraulic radii – types of vegetation – roughness of different grasses – Design of vegetated water ways.

Unit – V:

Sedimentation – Sedimentation in reservoirs in streams, estimation and measurement, sediment delivery ratio, trap efficiency – Estimation of useful life of reservoir based on sedimentation. Characteristics of contours and preparation of contour maps – Analysis of toposheets. Introduction to water harvesting techniques – Estimation of Earth work Design of farm ponds – Introduction to Stream water quality and pollution. Temporary gully control structures – Design – Types like Brush wood dams – Wire Mesh – Dams etc. – Introduction to permanent gully control structures – Design phases – Components of permanent structures.

TEXT BOOKS:

1. Soil and Water Conservation Engineering. Scwab G.O. Frevert R.K. Edminster T.W. and Barnes K.K. 1981 John Wiley and Sons New York.
2. Manual of Soil and Water Conservation Practicals. Gurmel Singh. Venkataramanam C. Sastry G and Joshi BP. 1994.Oxford and IBH Publishing Co. Ltd., New Delhi.

REFERENCES:

1. Land and Water Management Engineering. Murthy VVN 2004. Kalyani Publishers, New Delhi.
2. Introduction to Soil and Water Conservation Engineering. Mal B.S. 1995 Kalyani Publishers, Rajinder Nagar, Ludhiana.

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(A53008) AGRICULTURAL PROCESS ENGINEERING

Objective: To train students on unit operations of agricultural process engineering to acquaint with preliminary operations such as clearing, size reduction, mixing, separation, filtration and materials handling equipment.

Unit-I:

Scope and importance crop processing – principles and methods of food processing cleamomg amd gradomg pf cerea;s. [l;ses & oilseeds – Principles. Size reduction – Introduction, benefits, classification, determination and designation of the fineness of ground material, screen analysis, principle of comminution, mechanisms of comminution of food, particle shape, mixed particle sizes, average particle size, Size reduction – Characteristics of comminuted products, crushing efficiency. empirical relationships (Rittingen's Kick's and Bond's equations), Work index, energy utilization, methods of operating crushers, classification based on particle size, nature of the material to be crushed, Size reduction equipment – Principal types, crushers (jaw crushers, gyratory, smooth roll), hammer mills and impactors, attrition mills, buhr mill, tumbling mills, action in tumbling mills, Size reduction equipment –Ultra fine grinders (classifying hammer mills, fluid energy mill, micronized fluid jet pulverize, colloid mill), cutting machines (slicing, dicing, shredding, pulping) energy requirement of cutting operation, maintenance of cutting edges.

Unit-II:

Mixing –Introduction, theory of solids mixing, criteria of mixer effectiveness and mixing index for granular solids, missing indicters, mixing of widely different quantities, criteria of mixer effectiveness and mixing index for pastes and plastic masses, mixing index at zero time, rate of mixing index at zero time, rate of mixing, theory of liquid mixing, power requirement for liquids mixing. Mixing equipment – Mixers for low or medium viscosity liquids (paddle agitators, impeller agitators, powder-liquid contacting devices, other mixers), mixers for high viscosity liquids and pastes, misers for dry powders and particulate solids. Aerodynamics of agricultural products – drag coefficient – frictional drag and profile drag or pressure drag – and terminal velocity. Theory of separation, types of separators, cyclone separators, size of screens applications, Separator based on length, width, and shape of the grains, specific gravity density.

Unit –III:

Air-screen grain cleaner-principle and types, Design considerations of air-

screen grain cleaners, Sieve analysis-particle size determination, Ideal screen and actual screen–effectiveness of separation and related problems, Pneumatic separator, Theory of filtration, rate of filtration, pressure drop during filtration, applications, Constant-rate filtration and constant–pressure filtration derivation of equation, Filtration equipment; plate and frame filter press, rotary filters, centrifugal filters and air filters.

Unit-IV:

Threshing, Winnowing, cleaning and separation equipment, air screen cleaner, Rice millings, principles and equipments, paddy parboiling methods and equipment, wheat milling, milling of pulses and oilseeds, Scope and importance of material handling devices, study of different material handling systems–Classification, principles of operation, conveyor systems selection/ design.

Unit –V:

Belt Conveyor–Inclined belt conveyors, idler spacing, belt tension, drive tension, belt tripper, Belt Conveyor–Inclined belt conveyors, idler spacing, belt tension, drive tension, belt tripper, Chain conveyor–Principle of operation, advantages, disadvantages, capacity and speed, conveying chain, Screw conveyor – Principle of operation, capacity, power, troughs, loading and discharge, inclined and vertical screw conveyors. Bucket elevator–Principle, classification, operation, advantages, disadvantages, capacity, speed, buckets pickup, Bucket elevator – Bucket discharge, relationship between belt speed, pickup and bucket discharge, buckets types, Pneumatic conveying system- capacity and power requirement, types, air/product, Gravity conveyor design considerations – capacity and power requirement.

REFERENCES:

1. Transport Processes and separation Process Principle, Geankoplis C J 2003 Prentics-Hall Inc., New Jersey.
2. Unit operations in Food processing, Earle R L 1983. Pergamon Press, New York
3. Post Harvest Technology of Cereals, Pulses and oil seeds, Chakravarthy A and De Ds 1988. Oxford and IBH Publishing Co. Ltd., Calcutta.
4. Unit Operations of Chemical Engineering, McCabe WL , Smith JC and Harriott P 1993 Mc Graw-Hill Book Co., Boston.
5. Unit Operations of Agricultural Processing,Sahay KM and Singh KK 1994, Vikas Publishing House Pvt. Ltd., New Delhi.

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(A50324) RENEWABLE ENERGY SOURCES

UNIT – I

Principles of Solar Radiation: Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power - Physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, Solar radiation on titled surface, Instruments for measuring solar radiation and sun shine, solar radiation data.

UNIT – II

Solar Energy Collection: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

Solar Energy Storage and Applications: Different methods, sensible, latent heat and stratified storage, solar ponds. Solar applications - solar heating/ cooling techniques, solar distillation and drying, Photovoltaic energy conversion.

UNIT – III

Wind Energy: Sources and potentials, horizontal and vertical axis windmills, performance characteristics.

Bio-Mass: Principles of Bio-Conversion, Anaerobic /aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C. Engine operation, and economic aspects.

UNIT – IV

Geothermal Energy: Resources, types of wells, methods of harnessing the energy, potential in India.

OTEC : Principles, utilization, setting of OTEC plants, thermodynamic cycles.

Tidal and Wave Energy: Potential and conversion techniques, mini-hydel power plants, their economics.

UNIT –V

Direct Energy Conversion: Need for DEC, Carnot cycle, limitations, Principles of DEC. Thermo-electric generators, Seebeck, Peltier and Joule Thompson effects, figure of merit, materials, applications, MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principle, faraday's laws, thermodynamic aspects, selection of fuels and operating conditions.

TEXT BOOKS:

1. Renewable Energy Sources / Twidell & Weir / Taylor and Francis / 2nd Special Indian Edition
2. Non- conventional Energy Sources / G.D. Rai / Dhanpat Rai and Sons

REFERENCE BOOKS:

1. Energy Resources Utilization and Technologies / Anjaneyulu & Francis / BS Publications/2012
2. Principles of Solar Energy / Frank Krieth & John F Kreider / Hemisphere Publications
3. Non-Conventional Energy / Ashok V Desai / Wiley Eastern
4. Non-Conventional Energy Systems / K Mittal / Wheeler
5. Renewable Energy Technologies / Ramesh & Kumar / Narosa
6. Renewable Energy Resources / Tiwari and Ghosal / Narosa

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(A53009) ENGINEERING PROPERTIES OF BIOLOGICAL MATERIALS AND FOOD QUALITY

Objective: To enable the students to understand the principles and concepts of various properties of biological materials to design various processing equipment to insure food quality and safety. They are the basis for measuring instruments and sensors.

Unit –I:

Physical characteristics of different food grains, fruits and vegetables – importance. Shape and size – criteria for describing shape and size. Roundness and sphericity – Volume and density – Specific gravity – Bulk density. Porosity – surface area – measurement of the same. Rheology – basic concepts – ASTM standard definition of terms. Rheological Properties – Force deformation behavior, stress and strain behavior. Visco – elasticity – time effects – Rheological models. Kelvin and Maxwell models – electrical equivalence of mechanical models.

Unit-II:

Rheological equations – Maxwell model and generalized Maxwell model. Kelvin model – creep – stress relaxation. Friction – basic concepts – effect of load sliding velocity. Friction in agricultural materials – measurement – rolling resistance – angle of intern friction and angle of repose. Flow of bulk granular materials – gravity flow in bins and hoppers. Aerodynamics of agricultural products – drag coefficient – frictional drag and profit drag or pressure drag -and terminal velocity.

Unit –III:

Electrical properties – Di electrical properties. Thermal Properties – specific heat – thermal conductivity-thermal diffusivity. Application of engineering properties in handling and processing machines and also storage structures. Food quality – Concept, objectives and importance. Food quality, control – methods of quality control sampling – purpose.

Unit-IV:

Quality control – sampling techniques. Sampling procedures for liquid, powdered and granular materials. Sensory evaluation or organoleptic evaluation of food quality, methods. Interpretation of sensory results in statistical quality control. Total quality management (TQM – parameters of quality management. The evolution of total quality management – total quality management (TQM). Total quality control principles of quality control – consumer preference and acceptance.

Unit –V:

Food laws and regulations in India. Food grade and standards – BIS, AGMARK, PFA, FPO, CAC (Codex alimantarious Commission. Sanitation in food industry – GMP. ISO 9000 series of standards. HACCP (Hazard analysis and critical control point) – objectives – principles – Steps involved in implementation of HACCP. Application of HACCP concept to milk and milk product – problems in implementing HACCP.

TEXT BOOK:

Physical properties of plant and animal materials, Mohsenin N N 1986. Gordon and Breach Science Publishers, New York.

REFERENCES:

1 Food and Process Engineering Technology, Wilhelm LR, Suler W A and Brusewitz, G H 2004. American Society of Agricultural Engineers (ASAE), St. Joseph, MI.

2 Engineering Properties of Foods, Rao M A, Syed S H Rizvi and Ashim K Datta 2005. CRC Press – Taylor & Francis Group, Boca Raton, FL.

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(A53007) AGRICULTURAL EXTENSION TECHNIQUES AND BUSINESS MANAGEMENT

Unit-I:

Describe the meaning of communication, explain models of communication process along with elements and their characteristics. Classify the methods and explain the meaning, objectives, procedure involved in carrying out various individual, group and mass contact methods and describe the factors influencing selection of extension methods.

Unit-II:

Discuss about the various information tools and sources like internet, cyber cafes, kiosks, video and teleconferencing, Parishkaram (Farmers call Center) in A.P. and kisan call centers and agriclinics including agricultural journalism. Discuss about the adoption and diffusion process and explain the models of adoption process and innovation-decision process, classify adopter categories and enlist the characteristics and explain the factors affecting adoption process. Describe the importance of capacity building of extension personnel and farmers and explain the meaning of training and discuss different types of training to farmers and enumerate the objectives of Farmer's Training Centre (FTC), mandate of Krishi Vignan Kendra (KVK) and objectives of District Agricultural Advisory and Transfer of Technology Centres (DAATTC).

Unit-III:

Management – Definition, decision management, importance of management, concepts, functions of management. Management – Management cycle, planning, organization, direction, control, co – ordination, communication. Agri – business management – Meaning, definition, concept, distinctive features of agribusiness management, application of management principles in agri – business.

Unit-IV:

Agro – based industries – Importance, need, procedure to be followed to setup agro – based industries, constraints in establishing agro – based industries. Project analysis – Project meaning, project cycle, identification, formulation, appraisal, Implementation, monitoring and evaluation. Project appraisal techniques – Undisounted techniques, pay back method, rate of return/return on investment, etc. Discounted techniques – NPV, BCR, IRR, sensitivity analysis.

Unit-V:

International trade – Definition, comparison between international trade and interregional trade, free trade vs. protectionism, methods of protectionism. India's contribution to international trade in food and agricultural commodities, share of agricultural products in total imports/exports of India, export – import policy. General agreement on trade and tariff (GATT), WTO, objectives, functions and structure of WTO, why WTO, ten benefits of WTO. Principles of WTO trading systems, MFN, national treatment, predictability, promoting fair competition, encouraging development and economic reform. WTO agreements – Provisions relate to agreements in agricultural and food commodities. Agreements on agriculture (AOA) – Domestic supply, market access, export subsidies agreements on sanitary and phyto – sanitary (SPS) measures, Trade related intellectual propert5y rights (TRIPS).

REFERENCES:

1. Education and Communication for Development, Dahama O.P. and Bhatnagar O.P 1980 –Ofxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Reaching the Unreached – Basics of Extension Education, Ganesh R., Mohammad Iqbal I. and Anandaraja N., Associated Publishing Company, New Delhi.
3. Essentials of Management, Joseph L Massie 1995. Prentice – Hall of India, New Delhi.
4. Agricultural Economics and Agri – business, Omri Rawlins N 1980. Prentice – Hall Inc., New Jersey.

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(A53083) FARM MACHINERY LAB

1. Study of various Farm Machiney, equipment.
2. Visit to machinery Production industry and ICAR, SAU'S research station.Determination of Field capacity and Field efficiency of primary tillage implements.
3. Draft and Fuel consumption measurement for different implements.
4. Study of different types of plough bottoms and shares of M.B. Plogh.
5. Determination of disc angle, tilt angle, concavity of a disc plough.
6. Calculation of draft and horse power.
7. Study of seed-cum-ferti drill and seed metering mechanisms.
8. Calibration of seed drill and problems.
9. Study of sprayers, dusters and measurement of nozzle discharge and field capacity.
10. Study of earth moving equipment through exposure Visit.
11. Construction and working of rotavators and weeding equipment
12. Practical Examination.

TEXT BOOKS:

1. Principles of Farm Machinery. Kepner R.A., Bainer, R and Barger E.L., 1987. CBS Publishers and Distributors, Delhi.
2. Elements of Agricultural Engineering. Jagadeshwar Sahay. 1992. Agro Book Agency, Patna.

REFERENCES:

1. Farm Machinery. Stone A.A. 1958. John Wiley and Sons. New York.
2. Farm Machinery and Equipment. Smith H.P. 1971. Tata Mc Graw-Hills. Publishing Co. Ltd., New Delhi.
3. Principals of Agricultural Engineering, Vol. I. Michael A.M. and Ohja T.P. 1985. Jain Brothers, New Delhi.
4. Land Reclamation Machinery. Borshahov Mansurov Sergecv 1988 Mir Publishers, Moscow.

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(A50086) ADVANCED COMMUNICATION SKILLS (ACS) LAB

Introduction

The introduction of the Advanced Communication Skills Lab is considered essential at 3rd year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organise ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

Objectives:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.
- To prepare all the students for their placements.

Syllabus:

The following course content to conduct the activities is prescribed for the Advanced Communication Skills (ACS) Lab:

1. **Activities on Fundamentals of Inter-personal Communication and Building Vocabulary** - Starting a conversation – responding appropriately and relevantly – using the right body language – Role Play in different situations & Discourse Skills- using visuals - Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.
2. **Activities on Reading Comprehension** –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.
3. **Activities on Writing Skills** – Structure and presentation of different types of writing – *letter writing/Resume writing/ e-correspondence/ Technical report writing/ Portfolio writing* – planning for writing – improving one's writing.
4. **Activities on Presentation Skills** – Oral presentations (individual and group) through JAM sessions/seminars/**PPTs** and written presentations through posters/projects/reports/ e-mails/assignments etc.
5. **Activities on Group Discussion and Interview Skills** – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video-conference and Mock Interviews.

Minimum Requirement:

The Advanced Communication Skills (ACS) Laboratory shall have the following infra-structural facilities to accommodate at least 35 students in the lab:

- **Spacious room with appropriate acoustics.**
- **Round Tables with movable chairs**
- **Audio-visual aids**
- **LCD Projector**
- **Public Address system**
- **P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ**
- **T. V, a digital stereo & Camcorder**
- **Headphones of High quality**

Prescribed Lab Manual: A book titled ***A Course Book of Advanced Communication Skills (ACS) Lab*** published by Universities Press,

Hyderabad.

Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

- **Oxford Advanced Learner's Compass**, 7th Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE**(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **The following software from 'train2success.com'**
  - **Preparing for being Interviewed**
  - **Positive Thinking**
  - **Interviewing Skills**
  - **Telephone Skills**
  - **Time Management**

Books Recommended:

1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. Advanced Communication Skills Laboratory Manual by Sudha Rani, D, Pearson Education 2011.
3. Technical Communication by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
4. Business and Professional Communication: Keys for Workplace Excellence. Kelly M. Quintanilla & Shawn T. Wahl. Sage South Asia Edition. Sage Publications. 2011.
5. The Basics of Communication: A Relational Perspective. Steve Duck & David T. McMahan. Sage South Asia Edition. Sage Publications. 2012.
6. English Vocabulary in Use series, Cambridge University Press 2008.
7. Management Shapers Series by Universities Press(India)Pvt Ltd., Himayatnagar, Hyderabad 2008.
8. Handbook for Technical Communication by David A. McMurrey & Joanne Buckley. 2012. Cengage Learning.
9. Communication Skills by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
10. Handbook for Technical Writing by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
11. Job Hunting by Colm Downes, Cambridge University Press 2008.
12. Master Public Speaking by Anne Nicholls, JAICO Publishing House, 2006.
13. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hil 2009.
14. Books on TOEFL/GRE/GMAT/CAT/ IELTS by Barron's/DELTA/ Cambridge University Press.
15. International English for Call Centres by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.

Learning Outcomes

Accomplishment of sound vocabulary and its proper use contextually.

Flair in Writing and felicity in written expression.

Enhanced job prospects.

Effective Speaking Abilities

DISTRIBUTION AND WEIGHTAGE OF MARKS:

Advanced Communication Skills Lab Practicals:

1. The practical examinations for the ACS Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the English Language lab sessions, there shall be continuous evaluation during the year for 25 sessional marks and 50 End Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned, by inviting the External Examiner from outside. In case of the non-availability of the External Examiner, other teacher of the same department can act as the External Examiner.

Mini Project: As a part of Internal Evaluation

1. **Seminar/ Professional Presentation**
2. **Report on the same has to be prepared and presented.**

* ***Teachers may use their discretion to choose topics relevant and suitable to the needs of students.***

* ***Not more than two students to work on each mini project.***

* ***Students may be assessed by their performance both in oral presentation and written report.***

Outcomes

- Accomplishment of sound vocabulary and its proper use contextually.
- Flair in Writing and felicity in written expression.
- Enhanced job prospects.
- Effective Speaking Abilities

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(A63013) IRRIGATION AND DRAINAGE ENGINEERING

Unit –I:

Introduction Irrigation Engineering, advantages of irrigation, necessity and development of irrigation in India and AP and classification if irrigation projects, Irrigation terminology-GCA,CCA, Base period, crop period, Delta, Duty, Relationship between Duty and Delta (Delta= (864B) / Duty cm), Introduction soil-water plant relationships, soil physical properties such as soil texture, soil structure, capillary conductivity, soil consistency-volume-mass relationships of soil constituents, Water relations of soil, kinds of soil water-Hygroscopic, Capillary and Gravitational movement of water into soils, Infiltration, factors affecting infiltration, procedure for measurement of infiltration rate and development of infiltration equations (Kostia-Kov equations-curve fitting) $Ic=KT^n+b$), Soil moisture characteristic curves, difference between soil moisture stress and soil moisture tension, soil moisture constants such as saturation capacity, field capacity moisture equivalent and permanent wilting point. Terminology related with movement of water within soils-water intake, percolation, interflow, seepage, permeability, hydraulic conductivity and hydraulic gradient- Measurement soil moisture by different methods, Evaporation, transpiration and evapo-transpiration-Estimation by Blaney-Criddle Thornthwaite, penman and modified Penman equations only-Potential ET.

Unit-II:

Water requirements of crops-Importance of water in plant growth, procedures of working out the net irrigation requirement (depth of irrigation) gross irrigation requirement, irrigation frequency and Irrigation efficiency (conveyance, application, storage, distribution, water use efficiency) with few numerical examples, Water application methods-classification, border irrigation, components of border irrigation-Width, Length and Slope for different soils for different soils, Hydraulics of border irrigation(Advance curve, Recession Curve and Opportunity time through Time and Distance Curve) design of border irrigation. Derivation of Israelson's equation for the width of the border (X= (Q/W.I) (1-eity), Furrow irrigation system-advantages and disadvantages, determination of infiltration depth in furrows by inflow-outflow method (Steam size, Distance Advance time, CS area and Wetted Perimeter data problem on computation of infiltration depth), Check basin irrigation–advantages and disadvantages, estimation of infiltration under check basin conditions, adaptability and design considerations.