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B.Tech III-II Semester (EIE)

S. No.	Course Code	Subject	L	T	P	C
1.	15A10601	Analytical Instrumentation	3	1	-	3
2.	15A04601	Microprocessors and Microcontrollers	3	1	-	3
3.	15A10602	Process Control	3	1	-	3
4.	15A10603	Power Plant Instrumentation	3	1	-	3
5.	15A10604	Industrial Instrumentation	3	1	-	3
6.	15A04603 15A10605 15A10606 15A01608	**CBCC-I** a. Digital Signal Processing b. PC based Instrumentation c. Automotive Electronics d. Intellectual Property Rights	3	1	-	3
7.	15A10607	Process Control Laboratory	-	-	4	2
8.	15A10608	Analytical Instrumentation Laboratory	-	-	4	2
9.	15A52602	Advanced English Language Communication (AELCS) Laboratory (Audit Course)	-	-	2	-
10.	15A10609	Comprehensive Online Examination-II	-	-	-	1
		Total:	**18**	**06**	**12**	**23**

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

	L	T	P	C
B. Tech III-II Sem. (EIE)	3	1	0	3

15A10601 ANALYTICAL INSTRUMENTATION

Course Objective:

Provide a solid background in the fundamental concepts and methods of spectroscopy, chromatography & environmental pollution and an appreciation of issues in each of these fields in current research.

Course Outcome:

On successful completion of the module students will be able to:

- Acquire knowledge about the interaction of electromagnetic radiations with matter and apply analytical techniques to accurately determine the elements present in the given sample.
- Select Instrument for a particular analysis with come idea of its merits, demerits and limitations
- Learn specific technique employed for monitoring different pollutants in air and water.
- They can understand the applications and usage of chromatography in real time industrial environments

UNIT I

Electromagnetic radiation – different regions, their wavelengths, frequencies and energies - interaction of EM radiations with matter – atomic, molecular, electronic interaction - Basic principles of spectroscopy – emission and absorption ofradiations – resonance - radiation sources – dispersing and resolving techniques – detectors - typical atomic emission and absorption spectrographs in the UV and visible region.

UNIT II

Molecular spectra – electronic, vibrational and rotational energies and spectra characteristic bands of radicals, OH, CH, CO, etc., - IR absorption - spectroscopy – single and double beam spectrophotometers - instrumentation techniques for analyzing solid, liquid and gaseous samples – sample handling techniques.

UNIT III

Microwave spectroscopy – NMR, ESR and EPR spectroscopy – basic principles – instrumentation techniques and applications - principles of ion optics – ion sources – single focusing and double focusing mass spectrometers – principles and application

UNIT IV

Principles of X-ray fluorescence spectrometry and flame photometry – detection of Xrays and nuclear radiations – ionization chamber - proportional counter – GM counter - scintillation counter - solid state detector - gamma ray spectrometers – isotope dilution and tracer techniques for quantitative estimation and analysis.

UNIT V

Electrochemical methods – electrical conductivity of liquids conductivity and water purity – practical measurements and application – sulphur dioxide monitor – determination of pH – oxygen analyzers. Principles of gas and liquid chromatography – process chromatography– operation of typical process chromatography.

Text Books:

1. H.H. Willard, L.L. Merrit, J.A. Dean and F.A. Settle, Instrumental methods of Analysis, 6th edition - CBS Publishers and Distributers, 1986.
2. B.E.Noltingk (Edtr,) Jone‘s Instrument Technology, Vol. 2, Fourth Edition, Butterworths, 1986 (chapters 4 &5 for unit 5)

Reference Books:

1. *D.A. Skoog and D.M. West, Principles of Instrumental Analysis, 2 nd edition, Holt-Saunders, 1980.*

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B. Tech III-II Sem. (EIE)

L	T	P	C
3	1	0	3

15A04601 MICROPROCESSORS AND MICROCONTROLLERS

Course Objectives:

- To understand the architecture of 8086 MICROPROCESSOR.
- To learn various 8086 Instruction set and Assembler Directives.
- To learn 8051 assembly Language programming

Course Outcomes:

After completion of this subject the students will be able to :

1. Do programming with 8086 microprocessors
2. Understand concepts of Intel x86 series of processors
3. Program MSP 430 for designing any basic Embedded System
4. Design and implement some specific real time applications Using MSP 430 low power microcontroller.

UNIT I

Introduction-8086 Architecture-Block Diagram, Register Organization, Flag Register, Pin Diagram, Timing and Control Signals, System Timing Diagrams, Memory Segmentation, Interrupt structure of 8086 and Interrupt Vector Table. Memory organization and memory banks accessing.

UNIT II

Instruction Formats -Addressing Modes-Instruction Set of 8086, Assembler Directives-Macros and Procedures.- Sorting, Multiplication, Division and multi byte arithmetic code conversion. String Manipulation instructions-Simple ALPs.

UNIT III

Low power RISC MSP430 – block diagram, features and architecture,Variants of the MSP430 family viz. MSP430x2x, MSP430x4x, MSP430x5x and their targeted applications, MSP430x5x series block diagram, Addressing modes, Instruction set Memory address space, on-chip peripherals (analog and digital), and Register sets. Sample embedded system on MSP430 microcontroller.

UNIT-IV

I/O ports pull up/down resistors concepts, Interrupts and interrupt programming. Watchdog timer. System clocks. Low Power aspects of MSP430: low power modes, Active vs Standby current consumption, FRAM vs Flash for low power & reliability.

Timer & Real Time Clock (RTC), PWM control, timing generation and measurements. Analog interfacing and data acquisition: ADC and Comparator in MSP430, data transfer using DMA.

UNIT-V:

Serial communication basics, Synchronous/Asynchronous interfaces (like UART, USB, SPI, and I2C). UART protocol, I2C protocol, SPI protocol. Implementing and programming UART, I2C, SPI interface using MSP430, Interfacing external devices. Implementing Embedded Wi-Fi using CC3100

Text Books:

1. "Microprocessor and Microcontrollers", N. Senthil Kumar, M. Saravanan, S. Jeevanathan, Oxford Publishers. 1 st Edition, 2010
2. "The X86 Microprocessors , Architecture, Programming and Inerfacing" , Lyla B. Das, Pearson Publications, 2010
3. MSP430 microcontroller basics. John H. Davies, Newnes Publication, I st Edition, 2008

References:

http://processors.wiki.ti.com/index.php/MSP430_LaunchPad_Low_Power_Mode
http://processors.wiki.ti.com/index.php/MSP430_16-Bit_Ultra-Low_Power_MCU_Training

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B. Tech III-II Sem. (EIE)

L	T	P	C
3	1	0	3

15A10602 PROCESS CONTROL

Course Objective:

To provide the students with the knowledge on process characteristics and different control schemes for different process

Course Outcome:

- To study the characteristics of various process characteristics
- To understand the functions of process Control elements
- To study the Characteristics of PID controller, Automanual transfer and tuning methods.
- To study the various control schemes.
- To understand the Multivariable Control

UNIT I

PROCESS CHARACTERISTICS: Terms and Objectives, Incentives for process Control – design aspects of a Process Control System- Classification of variables. Process Equation, Process variables, Degrees of freedom. Characteristics of liquid system, gas system, thermal system. Mathematical modelling of processes. Self regulating-Servo and Regulatory, Interacting and Non-Interacting process – inverse response.

UNIT II

PROCESS CONTROL ELEMENTS: Signal conversion - I/P, P/I Converters, Pneumatic and Electric actuators, Valve Positioner-Control Valve – Characteristics of Control Valves-Types of control valves-control valve sizing- cavitation and flashing. Dynamics of batch and Continuous process.

UNIT III

CONTROLLER: - Basic control actions – Discontinuous control mode, Continuous control mode- Proportional, Single speed floating, Integral and Derivative– Composite control modes – P+I, P+D and P+I+D control modes. Response of controller for different types of test inputs –Integral windup – Auto manual transfer. Selection of control mode for different processes – Typical control schemes for level flow, pressure and temperature.

CONTROLLER TUNING: – Zeigler and Nichols open and Closed loop methods, Performance indices–Based on evaluation criteria – ISE, IAE, ITAE.

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UNIT IV

VARIOUS CONTROL SYSTEMS : Feed Forward Control ,Cascade control , Ratio control,Over ride control, Split range control , Selective control ,Adaptive control, Inferential control.

UNIT V

MULTIVARIABLE CONTROL: Introduction -Control loop interaction –motivation – general pairing problem- relative gain array-properties- application of RGA- RGA sensitivity zeros and performance limitation –scaling consideration-block diagram analysis- decoupling design of non interacting control loops Piping and Instrumentation Diagram, Instrument terms and Symbols. Introduction to Intelligent controllers.

Text Books:

1. C.Stephanopoulos, ―Chemical process control‖, Prentice Hall of India. 1998.
2. Singh, _ Process Control‖ PHI Learning, 2009

Reference Books:

1. D.P. Eckman, ―Automatic Process Control‖, Wiley Eastern Ltd., 1972.
2. D.R. Coughanowr, ―Process System Analysis and Control‖, Second Edition, McGraw Hill 1991.
3. K. Ogata, ―Modern Control Engineering‖, Prentice Hall of India, 1982.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

	L	T	P	C
B. Tech III-II Sem. (EIE)	**3**	**1**	**0**	**3**

15A10603 POWER PLANT INSTRUMENTATION

Course Objective:
Able to introduce various methods of power generation and specially provide the knowledge of instrumentation and control in thermal power plants.

Course Outcome:
Upon completion of this course the student shall be able to apply his knowledge and understand how instrumentation system designed for a power plant.

UNIT I
OVERVIEW OF POWER GENERATION

Brief survey of methods of power generation-Hydro, thermal, nuclear, solar, wind, ocean etc. Importance of Instrumentation and control in power generation, piping and instrumentation diagram, Cogeneration of power, Control Rooms.

UNIT II
BOILER MANAGEMENT SYSTEM

Building block for boiler, boiler feed water circulation, measurements in water circuits, boiler drum level control, superheated steam temperature control, steam pressure control, feed water treatment, air-fuel circuit, measurement of pressure temperature flow level in air fuel circuit, combustion control, furnace draft control, deaerator control.

UNIT III
TURBO SUPERVISORY SYSTEM
Principles of steam turbine and gas turbine, condenser vacuum control, inlet and outlet measurements, governors, gland steam exhaust pressure control, speed vibration shell temperature monitoring and control, lubricating oil temperature control, generator cooling.

UNIT IV
POWER PLANT MANAGEMENT
Introduction, Master Control, Combustion Process, Boiler Efficiency, Maintenance of Measuring Instruments, Intrinsic and Electrical Safety, Interlocks for Boiler Operation, Computer based Control and Data Logging Systems, Distributed Control Systems.

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UNIT V

ANALYZERS IN POWER PLANTS

Impurities in raw water, fuel analyzers, pH meter, conductivity meter, chromatography, oxygen measurement in flue gas, measurement of exhaust gas temperature, carbon dioxide measurement, combustion analyzer , infrared flue gas analyzer, smoke detector, dust monitor, pollution monitoring instruments.

Text Books:

1. *Power Plant Instrumentation by K. Krishnaswamy, M. Ponni Bala, M. Ponni Bala PHI Learning Pvt. Ltd., 2011.*
2. *Modern Power station practice, vol. 6, Instrumentation, controls and testing, Pergamon press, Oxford, 1971.*

Reference Books:

1. *Power-Plant Control and Instrumentation: The Control of Boilers and Hrsg Systems, David Lindsey IET, 2000.*
2. *Pow Plant Engg, Nag, Tata McGraw-Hill Education, 07-Aug-2008.*

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B. Tech III-II Sem. (EIE)

L	T	P	C
3	1	0	3

15A10604 INDUSTRIAL INSTRUMENTATION

Course Objective:

To study the various parameter like vacuum, pressure, temperature, floe, level, force, torque, velocity torque, nuclear radiation, used in process industry, power plants manufacturing and automation plants.

Course Outcome:

Upon completion of the subject, the students shall be able to understand how the various process parameters are measured.

UNIT I

PRESSURE AND TEMPERATURE MEASUREMENT

Vacuum and low pressure measurement using Monometer, McLeod Gage, Knudsen Gage, Ionization Gases, Thermal conductivity. Pressure measurement using bourdon gages, capsule gages, bellows, pressure transmitter, dead weight tester, force balance, vibration cylinder, dual gage techniques, and calibration.

Temperature standards, fixed points, filled system thermometers, bimetallic thermometer, types of thermocouple, laws of thermocouples, cold junction compensation, RTD, 2wire,3wire, 4wire connections, thermistor and linearization, IC sensors, optical and radiation pyrometers, calibration.

UNIT II

FLOW AND LEVEL MEASUREMENT

Solid flow measurement, Flow equation, flow measurement in pipelines, liquid and gas rotameter, head type, positive displacement, vortex type, hotwire anemometer, electromagnetic type, ultrasonic type, laser Doppler velocimeter, mass flow meter, gas flow meter, selection criteria, calibration.

Solid level measurement, visual technique, float operated devices, displacer devices, pressure gage method, diaphragm type, differential pressure method, boiler drum level, electrical methods, conductive sensor, capacitive sensor, ultrasonic type, purging techniques.

UNIT III

FORCE AND TORQUE MEASUREMENT

Force measurement, different methods, gyroscopic method, vibrating wire sensor, strain gage type, calibration.

Definition of torque, different methods, dynamometer, gyroscope, calibration.

UNIT IV

VELOCITY AND ACCELERATION MEASUREMENT

Relative velocity, translational and rotational velocity measurement, velocity of rotating machinery, speed measurement using tachometer, electrical and magnetic types, revolution counter, proximity type, photo electric type, stroboscope. Acceleration-accelerometer- different types-measurement in rotating machinery- calibration.

UNIT V

OTHER MEASUREMENTS

Nuclear radiation fundamentals, radiation detector, sound level meter, microphone, hydrophone, humidity and moisture measurement, overview of density measurement, measurement of chemical composition, smoke measurement, pollution measurement, clean room and measurement of particles.

Text Books:

1. Measurement systems-Application and Design- by Doeblin, 4/e, McGraw Hill International, 1990.
2. Mechanical measurements by A.K Shawney, Khanna publishers.
3. Instrumentation by C.S.Rangan, Mani and Sharma, Tata McGraw Hill publishing.

Reference Books:

1. Process Instruments and Control Handbook by D.M Considine, 4/e, McGraw Hill International, 1993.
2. Mechanical and Industrial Measurements by R.K.Jain, Khanna Publishers, 1986.
3. Instrument Technology, vol,1 by E.B.Jones, Butterworths, 1981.

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B. Tech III-II Sem. (EIE)

L	T	P	C
3	1	0	3

15A04603 DIGITAL SIGNAL PROCESSING
(CBCC-I)

Course Objectives:

- Program a DSP chip to filter signals using either assembly language or a C compiler for the chip.
- Use Z transforms and discrete time Fourier transforms to analyze a digital system.

Course Outcomes:

At the end of the course, the student should be able to:

- Formulate engineering problems in terms of DSP tasks.
- Apply engineering problems solving strategies to DSP problems.
- Design and test DSP algorithms.
- Analyze digital and analog signals and systems.
- Analyze and compare different signal processing strategies.

UNIT-I

Review of discrete-time signals and systems – Time domain analysis of discrete-time signals & systems, Frequency domain analysis of discrete-time signals and systems.
Discrete Fourier Transform: Frequency-domain sampling and reconstruction of discrete-time signals, Discrete Fourier Transform (DFT), The DFT as a linear transformation, Relationship of the DFT to other transforms, Properties of DFT, Linear filtering methods based on DFT, Frequency analysis of signals using the DFT.

UNIT-II

Efficient computation of the DFT – Direct computation of DFT, Divide and conquer approach to computation of DFT, Radix-2, Radix-4, and Split radix FFT algorithms, Implementation of FFT algorithms, Applications of FFT algorithms – Efficient computation of the DFT of two real sequences, 2N point real sequences, Use of the FFT algorithm in linear filtering and correlation, A linear filtering approach to computation of the DFT- the Goertzel, and the Chirp-z transform algorithms, Quantization errors in the computation of DFT.

UNIT-III

Structures for the realization of discrete-time systems, Structures for FIR systems - Direct form, Cascade form, Frequency sampling, and Lattice structures, Structures for IIR systems – Direct form, Signal flow graphs & Transposed, Cascade form, Parallel

form and Lattice structures, Conversion from Lattice structure to direct form, lattice – Ladder structure.

UNIT-IV

General considerations – Causality and its implications, Characteristics of practical Frequency Selective Filters, Design of Finite Impulse Response (FIR) filters – Symmetric and asymmetric FIR filters, Design of linear phase FIR filters using windows, Design of linear phase FIR filters by the frequency sampling method, Design of optimum equi-ripple linear phase FIR filters, Comparison of design methods for linear phase FIR filters, Design of Impulse Invariance Response (IIR) filters from analog filters – IIR filter design by approximation of derivatives, by Impulse invariance, and by bilinear transformation methods, Characteristics of commonly used analog filters, Design examples of both FIR and IIR filters, Frequency transformation in the analog and digital domains, Illustrative problems.

UNIT-V

Introduction, Decimation, and interpolation, Sampling rate conversion by a rational factor, Implementation of sampling rate conversion, Multistage implementation of sampling rate conversion, Sampling rate conversion of bandpass signals, Sampling rate conversion by arbitrary factor, Applications of multirate signal processing.

TEXT BOOKS:

1. John G. Proakis, Dimitris G. Manolakis, "Digital signal processing, principles, Algorithms and applications," Pearson Education/PHI, 4th ed., 2007.
2. Sanjit K Mitra, "Digital signal processing, A computer base approach," Tata McGraw Hill, 3rd edition, 2009.

REFERENCES:

1. A.V.Oppenheim and R.W. Schaffer, & J R Buck, "Discrete Time Signal Processing," 2nd ed., Pearson Education, 2012.
2. B. P. Lathi, "Principles of Signal Processing and Linear Systems," Oxford Univ. Press, 2011.
3. Li Tan, Jean Jiang, "Digital Signal Processing, Fundamentals and Applications," Academic Press, Second Edition, 2013.

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B. Tech III-II Sem. (EIE)

L	T	P	C
3	1	0	3

15A10605 PC BASED INSTRUMENTATION
(CBCC-I)

Course Objective:

1. It is to provide and ensure a comprehensive understanding of using personal computers in measurement and control instrumentation.
2. Learn the process of collecting information/ data through PC from real world sources.
3. Learn remote and networked data acquisition and operating system.
4. Learn programmable logic controllers, and its application.

UNIT –I

Introduction to Computer Instrument Communication:

Personal Computer, Overview of operating System, I/O Ports, Plug-in-slots, PCI bus, Operators Interface. Computer Interfacing for Data Acquisition and Control – Interfacing Input Signals, Output system with continuous actuators, Data Acquisition and Control using Standard Cards: PC expansion systems, Plug-in Data Acquisition Boards; Transducer to Control room, Backplane bus – VXI.

UNIT –II

Programmable logic controller (PLC) basics:

Definition, Overview of PLC systems, input/output modules, Power supplies and Isolators.

Basic PLC programming:

Programming On-Off inputs/ outputs. Creating Ladder diagrams, Basic PLC functions, PLC Basic Functions, register basics, timer functions, counter functions.

UNIT – III

PLC intermediate and advanced functions:

Arithmetic functions, Number comparison functions, Skip and MCR functions, data move systems. Utilizing digital bits, sequencer functions, Matrix functions. PLC Advanced functions: Analog PLC operation, Networking of PLC

UNIT –IV

Application of PLC:

Controlling of Robot using PLC, PID control of continuous processes, Continuous Bottle-filling system, Batch mixing system, 3-stage air conditioning system, Automatic frequency control of Induction heating.

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UNIT – V

Related Topics:

Alternate programming languages. Auxiliary commands and functions. PLC installation, troubleshooting and maintenance. Field bus: Introduction, concept. HART protocol: Method of operation, structure, and applications. Smart transmitters, smart valves and smart actuators.

Text Books

1. *Programmable Logic Controllers – Principles and Applications, John. W .Webb Ronald A Reis , Fourth edition, Prentice Hall Inc., New Jersey, 1998.*
2. *Computer Control of Processes – M.Chidambaram. Narosa 2003*

References

1. PC Based Instrumentation and Control Third Edition by Mike Tooley ; Elsevier.
2. PC Interfacing and Data Acquisition Techniques for Measurement, Instrumentation and Control. By Kevin James; Elsevier.
3. Practical Data Acquisition for Instrumentation and Control Systems by John Park and Steve Mackay.
4. Distributed Control Systems, Lukcas M.P, Van Nostrand Reinhold Co., New York, 1986. Programmable Logic Controllers, Second edition, Frank D. Petruzella, Mc Graw Hill, Newyork, 1997.
5. Programmable Logic Controllers Programming methods and applications- Prentice Hall by. John R. Hackworth and Frederick D. Hackworth, Jr.

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B. Tech III-II Sem. (EIE)

L	T	P	C
3	1	0	3

15A10606 AUTOMOTIVE ELECTRONICS
(CBCC-I)

***Course Objective**:*
To make the students to understand the basic principle of conventional automobile and its replacement by modern electronic system.

Course Outcome:
The students understand how the conventional automotive subsystems are replaced by modern electronic systems , their relative advantages and comfort.

UNIT I
INTRODUCTION TO AUTOMOTIVE INDUSTRY AND MODERN AUTOMOTIVE SYSTEMS
Vehicle classifications and specifications, Introduction to modern automotive systems and need for electronics in automobiles, Application areas of electronics in the automobiles, Sensors and actuators, Possibilities and challenges in the automotive industry, Enabling technologies and industry trends

UNIT II
SPARK AND COMPRESSION IGNITION ENGINES
Ignition systems, Fuel delivery systems, Engine control functions, Fuel control, Calculation of injector pulse width and injection strategies, Ignition timing control, Lambda control, Engine control modes, Engine control diagnostics

UNIT III
TRANSMISSION CONTROL, BRAKING AND ELECTRONIC STABILITY CONTROL
Automotive transmissions- Transmission fundamentals- Types- Components, Introduction to electronic transmission control- Shift point control- Lockup control-torque converter clutch- Engine torque control during shifting, Safety and diagnostic functions, Improvement of shift quality, vehicle braking fundamentals, Vehicle dynamics during

Braking, brake system components, introduction to antilock braking systems, components and control logic, electronic stability and other technologies

UNIT IV
STEERING CONTROL:
Steering system basics, fundamentals of electronically controlled power steering types, electronically controlled hydraulic system, electric power steering

UNIT V

AUTOMOTIVE ELECTRONICS FOR PASSENGER SAFETY AND CONVENIENCE

Air bag and seat belt pretension systems- sensor functions, distributed front air bag sensing systems-single-point sensing systems- side-impact sensing- future occupant protection systems, tire pressure monitoring systems, configuration of systems such as power seats-power windows-remote keyless entry systems, types of hybrid vehicles-configurations- main components of hybrid Vehicles.

Text Books:

1. *Tom Denton, ―Automobile Electrical and Electronics Systems‖, Edward Arnold Publishers, 2000.*
2. *William B. Ribbens, ―Understanding Automotive Electronics‖, 5th edition, Newnes Publishing, 2000.*

Reference Books:

1. *Barry Hollembeak, ―Automotive Electricity, Electronics & Computer Controls‖, Delmar Publishers, 2001.*
2. *Fuel System and Emission controls‖, Check Chart Publication, 2000.*
3. *Ronald. K. Jurgon, ―Automotive Electronics Handbook‖, McGraw-Hill, 1999.*

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B. Tech III-II Sem. (EIE)

L	T	P	C
3	1	0	3

15A01608 INTELLECTUAL PROPERTY RIGHTS
(CBCC-I)

COURSE OBJECTIVE:

This course introduces the student to the basics of Intellectual Property Rights, Copy Right Laws Trade Marks and Issues related to Patents. The overall idea of the course is to help and encourage the student for startups and innovations.

UNIT – I

Introduction To Intellectual Property: Introduction, Types Of Intellectual Property, International Organizations, Agencies And Treaties, Importance Of Intellectual Property Rights.

UNIT – II

Trade Marks : Purpose And Function Of Trade Marks, Acquisition Of Trade Mark Rights, Protectable Matter, Selecting And Evaluating Trade Mark, Trade Mark Registration Processes.

UNIT – III

Law Of Copy Rights : Fundamental Of Copy Right Law, Originality Of Material, Rights Of Reproduction, Rights To Perform The Work Publicly, Copy Right Ownership Issues, Copy Right Registration, Notice Of Copy Right, International Copy Right Law. Law Of Patents : Foundation Of Patent Law, Patent Searching Process, Ownership Rights And Transfer

UNIT – IV

Trade Secrets : Trade Secrete Law, Determination Of Trade Secrete Status, Liability For Misappropriations Of Trade Secrets, Protection For Submission, Trade Secrete Litigation. Unfair Competition : Misappropriation Right Of Publicity, False Advertising.

UNIT – V

New Developments Of Intellectual Property: New Developments In Trade Mark Law ; Copy Right Law, Patent Law, Intellectual Property Audits. International Overview On Intellectual Property, International – Trade Mark Law, Copy Right Law, International Patent Law, International Development In Trade Secrets Law.

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TEXT BOOKS & REFERENCES:

1. Intellectual Property Rights, Deborah. E. Bouchoux, Cengage Learing.
2. Intellectual Property Rights– Unleashmy The Knowledge Economy, Prabuddha Ganguli, Tate Mc Graw Hill Publishing Company Ltd.,

Course Outcomes:

On completion of this course, the student will have an understanding of the following:

a) *Intellectual Property Rights and what they mean*
b) *Trade Marks and Patents and how to register them*
c) *Laws Protecting the Trade Marks and Patents*
d) *Copy Right and laws related to it.*

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B. Tech III-II Sem. (EIE)

L	T	P	C
0	0	4	2

15A10607 PROCESS CONTROL LABORATORY

Course Objective:
To understand practical aspect of process industries

Course Outcome:
Students can understand the closed loop control of various processes
Modeling of single capacity level process from experimental Reactive curve.

Obtain PID Turing parameters from the model.

1. Modeling of single capacity level process from experimental Reactive curve. Obtain PID Turing parameters from the model.
2. Modeling of Two capacity level process.
3. Modeling of two capacity interacting level process by semi log method.
4. Modeling of Thermal process from reaction curve and obtain tuning parameters from the model.
5. Modeling of Thermal process.
6. Closed loop control of flow process.
7. Closed loop control of level process.
8. Closed loop control of Thermal Process.
9. Closed loop control of Pressure process.
10. Inherent and Installed characteristic study of linear, equal percentage and quick opening valves.

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B. Tech III-II Sem. (EIE)

L	T	P	C
0	0	4	2

15A10608 ANALYTICAL INSTRUMENTATION LABORATORY

Course Objectives:

1. *Students will be introduced to modern analytical instruments with the goal of providing them with the tools.*
2. *The emphasis will be a "hands-on" approach with sample preparation, application, method development, data analysis and interpretation being key elements.*
3. *Interpret data derived from any analytical instruments.*

Course Outcomes:

1. *Apply basic lab safety rules while working in analytical instrumentation laboratories*
2. *Apply basic analytical processes and sampling procedures and perform them in the lab*
3. *Apply the basic principles of spectroscopy and work in real time with it.*
4. *Perform simple analytical procedures on given samples using Ultraviolet or Infrared Spectrophotometers leading to applied research.*

(Minimum 10 experiments should be completed)

1. Gas analyzers.
2. Gas and liquid chromatography.
3. Spectrometer: UV and VIS spectrometer.
4. Spectrometer: IR and FT IR Spectrometer.
5. Flame photometer.
6. Measurement of calorific value.
7. Mass spectrometer.
8. pH measurement.
9. Interfacing of ADC to PC and observe the data.
10. Interfacing of DAC to PC and generate various types of signals.
11. Serial communication through RS-232C between µCs / PCs.
12. Data transfer through IEEE-1394 (fireware) interface.
13. Data Acquisition System
14. Nuclear radiation detector.
15. Water Purity meter
16. Digital Conductivity meter
17. Digital Turbidity meter

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B. Tech III-II Sem. (EIE)

L	T	P	C
0	0	2	0

15A52602 ADVANCED ENGLISH LANGUAGE COMMUNICATION SKILLS (AELCS) LAB (Audit Course)

1. INTRODUCTION

With increased globalization and rapidly changing industry expectations, employers are looking for the wide cluster of skills to cater to the changing demand. 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 and to organise ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Taking part in social and professional communication.

2. COURSE 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.

3. SYLLABUS

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

UNIT-I: COMMUNICATION SKILLS

1. Reading Comprehension
2. Listening comprehension
3. Vocabulary Development
4. Common Errors

UNIT-II: WRITING SKILLS

1. Report writing
2. Resume Preparation
3. E-mail Writing

UNIT-III: PRESENTATION SKILLS

1. Oral presentation
2. Power point presentation
3. Poster presentation

UNIT-IV: GETTING READY FOR JOB

1. Debates
2. Group discussions
3. Job Interviews

UNIT-V: INTERPERSONAL SKILL

1. Time Management
2. Problem Solving & Decision Making
3. Etiquettes

4. 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

5. MINIMUM REQUIREMENT:

The Advanced English Communication Skills (AECS) Laboratory shall have the following infra-structural facilities to accommodate at least 60 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

6. SUGGESTED SOFTWARE:

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

1. **Walden Infotech: Advanced English Communication Skills Lab**
2. **K-VAN SOLUTIONS-Advanced English Language Communication Skillslab**
3. **DELTA's key to the Next Generation TOEFL Test: Advanced SkillsPractice.**
4. **TOEFL & GRE**(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
5. **Train2success.com**

7. BOOKS RECOMMENDED:

1. **Objective English for Competitive Exams**, Hari Mohana Prasad, 4th edition, Tata Mc Graw Hill.
2. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, O U Press 3rd Edn. 2015.
3. **Essay Writing for Exams, Audrone Raskauskiene, Irena Ragaisience & Ramute Zemaitience,OUP, 2016**
4. **Soft Skills for Everyone,** Butterfield Jeff, Cengage Publications, 2011.
5. **Management Shapers Series** by Universities Press (India) Pvt Ltd., Himayatnagar, Hyderabad 2008.
6. **Campus to Corporate,** Gangadhar Joshi, Sage Publications, 2015
7. **Communicative English,**E Suresh Kumar & P.Sreehari, Orient Blackswan, 2009.
8. **English for Success in Competitive Exams,** Philip Sunil Solomon OUP, 2015