

# Course Structure and Syllabus

## II BTech EIE II Semester

*(From the admitted batch of 2016 – 2017 under CBCS Scheme)*

Sub Code	Subject	Hrs/week		Max Marks		Total Marks	Credits
		Theory	Lab	Internal	External		
BTEIE401	COMPUTER ORGANIZATION	4	--	25	75	100	4
BTEIE402	SENSORS AND TRANSDUCERS	4	--	25	75	100	4
BTEIE403	DATA BASE MANAGEMENT SYSTEMS	4	--	25	75	100	4
BTEIE404	PRINCIPLES OF COMMUNICATION	4	--	25	75	100	4
BTEIE405	CONTROL SYSTEMS	4	--	25	75	100	4
BTEIE406	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	4	--	25	75	100	4
BTEIE407	TRANSDUCERS LAB	--	3	50	50	100	2
BTEIE408	DATA BASE MANAGEMENT SYSTEMS LAB	--	3	50	50	100	2
<b>TOTAL</b>		<b>24</b>	<b>6</b>	<b>250</b>	<b>550</b>	<b>800</b>	<b>28</b>

## **BTEIE401: COMPUTER ORGANIZATION**

**Theory : 4 Hrs/week**

**Credits : 4**

**Int Marks : 25**

**Ext Marks : 75**

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### **UNIT-I**

**Basic Computer Organization:** Functions of CPU, I/O Units, Memory Instruction: Instruction Formats - One Address, Two Addresses, Zero Address and Three Addresses and Comparison; Addressing Modes with Numeric Examples: Program Control - Status Bit Conditions, Conditional Branch Instructions, Program Interrupts: Types Of Interrupts.

### **UNIT-II**

**Input-Output Organizations:** I/O Interface, I/O Bus And Interface Modules: I/O Vs Memory Bus, Isolated Vs Memory-Mapped I/O, Asynchronous Data Transfer-Strobe Control, Hand Shaking: Asynchronous Serial Transfer- Asynchronous Communication Interface, Modes Of Transfer Programmed I/O, Interrupt Initiated I/O, DMA; DMA Controller, DMA Transfer.

### **UNIT-III**

**Memory Organizations:** Memory Hierarchy, Main Memory, RAM, ROM Chips, Memory Address Map, Memory Connection to CPU, Associate Memory, Cache Memory, Data Cache, Instruction Cache, Miss and Hit Ratio, Access Time, Associative, Set Associative Mapping, Waiting into Cache, Introduction to Virtual Memory.

### **UNIT-IV**

**8086 CPU:** Pin Diagram- Special Functions of General Purpose Registers. Segment Register, 8086 Flag Register, Addressing Modes of 8086, 8086-Instruction Formats: Assembly Language Programs Involving Branch and Call Instructions, Sorting, Evaluation of Arithmetic Expressions.

### **TEXT BOOKS:**

1. Computer System Architecture: Morris Mano.
2. Advanced Micro Processor and Peripherals - Hall/ A K Ray.

### **REFERENCE BOOKS:**

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
2. Structured Computer Organization and Design - Andrew S. Tanenbaum, 4th Edition PHI/Pearson.
3. Fundamentals or Computer Organization and Design – Sivaraama Dandamudi Springer Int. Edition.
4. Computer Architecture a quantitative approach, Jhon L. Hennessy and David A. Patterson, Fourth Edition Elsevier.
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

## BTEIE402: SENSORS AND TRANSDUCERS

Theory : 4 Hrs/week

Credits : 4

Int Marks : 25

Ext Marks : 75

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### UNIT I

#### Introduction to Measurement Systems

General concepts and terminology, measurement systems, sensor classifications: Analog Input and Output, Digital Input and Output, general input-output configuration, methods of correction.

#### Passive Sensors

**Resistive Sensors:** Potentiometers, Strain Gages, Resistive Temperature Detectors (RTDs), Thermistors, Light-dependent Resistors (LDRs), Resistive Hygrometers.

**Capacitive Sensors:** Variable capacitor and Differential capacitor.

**Inductive Sensors:** Reluctance variation sensors, Eddy current sensors, Linear variable differential transformers (LVDTs), Magneto elastic sensors, Electromagnetic sensors – Sensors based on Faraday's law of Electromagnetic induction, Touch Sensors: Capacitive, Resistive, Proximity Sensors.

### UNIT II

#### Self-Generating Sensors

**Thermoelectric Sensors:** Thermocouples, Thermo electric effects, Common thermocouples, Practical thermocouple laws, Cold junction compensation in thermocouples circuits.

**Pyroelectric Sensors:** Pyroelectric effect, pyroelectric materials, Radiation laws: Plank, Wein and Stefan-Boltzmann, Applications.

**Photovoltaic Sensors:** Photovoltaic effect, materials and applications.

### UNIT III

#### Digital Sensors

Position Encoders, Incremental position encoders, absolute position encoders, Variable frequency sensors-Quartz digital thermometers, vibrating cylinder sensors, SAW sensors, Digital flow meters. Sensors based on MOSFET Transistors, Charge coupled Sensors.

#### Smart Sensors

Definition of a Smart sensor, Smart sensor systems, Characteristics, Architectures, buses and interfaces, Smart sensors for electrical and non-electrical variables: Pressure and Temperature. Standards for Smart Sensors.

### UNIT IV

#### Mems Sensors and Applications

Unique Characteristics of MEMS, Typical Application Areas of MEMS, MEMS Accelerometer, Optical MEMS, MEMS as a switch, MEMS Micro actuators. Principles of micro sensors: MEMS for Pressure, Force and Temperature Measurement.

#### TEXT BOOKS:

1. Sensors and Signal Conditioning, Ramon Pallas-Areny, John G. Webster, 2<sup>nd</sup> Edition.
2. Sensors and Transducers: D. Patranabis, TMH 2003.

#### REFERENCE BOOKS:

1. Microsensors, MEMS and Smart Devices: Julian Garder, Vijay K. Varadan, John Wiley & Sons Ltd. (2006).
2. Sensor Technology Hand Book – Jon Wilson, Newne 2004.
3. Instrument Transducers – An Introduction to their Performance and design – by Herman K.P. Neubrat, Oxford University Press.
4. Measurement system: Applications and Design – by E.O. Doebelin, McGraw Hill Publications.
5. Electronic Instrumentation by H.S. Kalsi.

## BTEIE403: DATABASE MANAGEMENT SYSTEMS

**Theory : 4 Hrs/week**

**Credits : 4**

**Int Marks : 25**

**Ext Marks : 75**

### UNIT I

**Database System Introduction:** Data, DBMS, Database Users, Advantages and Applications of DBMS

**DBMS Concepts:** Data Models, Schemas and Instances, Three-Schema Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment, Centralized and Client/Server Architectures for DBMS, Classification of DBMS.

**Data Modeling Using the Entity-Relationship Model:** Using High-Level Conceptual Data Models for Database Design, Entity Types, Entity Sets Attributes and Keys, Relationships Types, Relationship Sets, Roles and Structural Constraints, Weak Entity types, ER diagrams, Naming Conventions and Design Issues, Enhanced Entity Relationship model.

### UNIT II

**Relational Data Model and Relational Database Constraints:** Relational Model Concepts, Constraints and Relational Schemas, Update Operations and Dealing with Constraint Violations, Relational Database Design Using ER to Relational Mapping.

**Relational Algebra and Relational Calculus:** Unary Relational Operations, Relational Algebra Set Operations, Binary Relational Operations, Additional Relational Operations, Examples of Queries in Relational Algebra, Tuple and Domain Relational Calculus.

**Schema Definition, Basic Constraints and Queries:** SQL Data definition, Specifying Basic Constraints in SQL, Schema Change Statements in SQL, Insert, Delete, Update Queries in SQL, More Complex SQL queries, Views in SQL, Data base Stored Procedures.

### UNIT III

**Relational Database Design:** Informal Design Guidelines for Relation Schema, Functional Dependencies, Normal Forms Based on Primary keys, General definitions of Second and Third Normal forms, BCNF, Properties of Relational Decomposition, Algorithm for Relational Database Design, Multi-Valued Dependencies and Fourth Normal form

**Indexing Structures for Files:** Types of single level ordered indexes, multilevel indexes, dynamic multilevel indexes using B Trees and B + TREES, Indexes on multiple keys.

### UNIT IV

**Transaction Processing:** Introduction to Transaction Processing, Transaction and System Concepts, Desirable Characteristics of Transactions, Characterising Schedules Based On Recoverability and Serializability

**Concurrency Control Techniques:** Two Phase Locking, Timestamp Ordering, Validation Concurrency Control, Multiple Granularity Locking

**Database Recovery Techniques:** Recovery Concepts, Recovery Based On Deferred and Immediate Updates, Shadow Paging

#### **TEXT BOOKS:**

1. Fundamentals of Database System, Elmasri, Navathe, Pearson Education.

#### **REFERENCES BOOKS:**

1. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw-Hill.
2. Database Concepts, Abraham Silberschatz, Henry F Korth, S Sudarshan, McGraw-Hill

## **BTEIE404: PRINCIPLES OF COMMUNICATION**

**Theory** : 4 Hrs/week  
**Int Marks** : 25

**Credits** : 4  
**Ext Marks** : 75

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### **UNIT I**

**Introduction** : Block diagram of Electrical communication system, Radio communication : Types of communications, Analog, pulse and digital Types of signals, Fourier Transform for various signals, Fourier Spectrum, Power spectral density, Autocorrelation, correlation, convolution.

**Amplitude Modulation:** Need for modulation, Types of Amplitude modulation, AM, DSB SC, SSB SC, Power and BW requirements, generation of AM, DSB SC, SSB SC, Demodulation of AM : Diode detector, Product demodulation for DSB SC & SSB SC.

### **UNIT II**

**Angle Modulation:** Frequency & Phase modulations, advantages of FM over AM, Bandwidth consideration, Narrow band and Wide band FM, Comparison of FM & PM.

**Pulse Modulations** : Sampling, Nyquist rate of sampling, Sampling theorem for Band limited signals, PAM, regeneration of base band signal, PWM and PPM, Time Division Multiplexing, Frequency Division Multiplexing, Asynchronous Multiplexing.

### **UNIT III**

**Digital Communication:** Advantages, Block diagram of PCM, Quantization, effect of quantization, quantization error, Base band digital signal, DM, ADM, ADPCM and comparison.

**Digital Modulation:** ASK, FSK, PSK, DPSK, QPSK demodulation, coherent and incoherent reception, Modems.

### **UNIT IV**

**Information Theory:** Concept of information, rate of information and entropy, Source coding for optimum rate of information, Coding efficiency, Shannon-Fano and Huffman coding.

**Error control coding:** Introduction, Error detection and correction codes, block codes, convolution codes.

#### **TEXT BOOKS:**

1. Communication Systems Analog and Digital – R.P. Singh and SD Sapre, TMH, 20th reprint, 2004.
2. Principles of Communications – H. Taub and D. Schilling, TMH, 2003.

#### **REFERENCE BOOKS:**

1. Electronic Communication Systems – Kennedy and Davis, TMH, 4th edition, 2004.
2. Communication Systems Engineering – John. G. Proakis and Masoud Salehi, PHI, 2<sup>nd</sup> Ed. 2004.

## BTEIE405: CONTROL SYSTEMS

**Theory** : 4 Hrs/week  
**Int Marks** : 25

**Credits** : 4  
**Ext Marks** : 75

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### UNIT I

**Introduction:** Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback.

**Mathematical Models** – Differential equations - Impulse Response and transfer functions - Translational and Rotational mechanical systems

### UNIT II

**Transfer Function Representation:** Transfer Function of DC Servo motor - AC Servomotor- Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples - Block diagram algebra – Representation by Signal flow graph - Reduction using mason's gain formula.

**Time Response Analysis:** Standard test signals - Time response of first order systems –Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants – Effects of proportional derivative, proportional integral systems.

### UNIT III

**Stability Analysis in S - Domain:** The concept of stability - Routh stability criterion – qualitative stability and conditional stability – limitations of Routh's stability

**Root Locus Technique:** The root locus concept - construction of root loci-effects of adding poles and zeros to  $G(s)$   $H(s)$  on the root loci. Basics of PID Controllers

### UNIT IV

**Frequency Response Analysis:** Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.

#### TEXT BOOKS:

1. Control Systems Theory and Applications, S.K Bhattacharya, Pearson
2. Control Systems, N.C. Jagan, BS Publications

#### REFERENCE BOOKS:

1. Control Systems, A. Anand Kumar, PHI
2. Control Systems Engineering, S. Palani, Tata – McGraw Hill
3. Control Systems, Dhanesh N.Manik, Cengage Learning
4. "I. J. Nagrath and M. Gopal", "Control Systems Engineering", New Age International (P) Limited, Publishers, 5<sup>th</sup> edition, 2009
5. "N. K. Sinha", "Control Systems", New Age International (P) Limited Publishers, 3<sup>rd</sup> Edition, 1998.

## BTEIE406: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Theory : 4 Hrs/week

Credits : 4

Int Marks : 25

Ext Marks : 75

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### UNIT I

#### Introduction to Managerial Economics

Definition, Nature and scope Managerial economics – Demand analysis: Demand determinants, Law of Demand and its exceptions. Elasticity of Demand : Definition , types, Measurement and significance of elasticity of Demand .Demand forecasting ,factors governing demand forecasting, methods of demand forecasting(survey methods, statistical methods, expert opinion method , test marketing , controlled experiments, judgemental approach to demand forecasting)

### UNIT II

#### Theory of Production and Cost Analysis

Production function –Isoquants and Isocosts, MRTS , Least Cost combination of inputs, Cobb-Douglas Production function, Laws of returns, Internal and external economies of scale. Cost Analysis: cost concepts, opportunity cost, fixed Vs Variable costs, explicit costs Vs Implicit cost, Out of pocket costs Vs Imputed costs. Break-even Analysis (BEA) – Determination of break even point (simple problems)- Managerial significance and limitations of BEA.

### UNIT III

**Market Structures & Pricing Strategies:** Market structures: Types of competition ,Features of perfect competition . Monopoly and momopolistic competition . Price- Output determination in case of perfect competition and monopoly. Objectives and policies of pricing – Methods of pricing

**Business and New Economic Environment:** Characteristics of business, features and evaluation of sole proprietorship, partnership, Joint stock company, public enterprises and their types, changing business environment in post – liberalisation scenario.

### UNIT IV

**Capital and Capital Budgeting:** Capital and its significance, types of capital, estimation of fixed and working capital requirements, methods and sources of raising finance. Nature and scope of capital budgeting , features of capital budgeting proposals , methods of capital budgeting.

**Financial accounting:** Double entry book keeping, journal, ledger , trial balance- final accounts.

**Financial Analysis Through Ratios:** Computation, Analysis and interpretation of liquidity ratios, Activity ratios, capital structure ratios and profitability ratios.

#### TEXT BOOKS:

1. Aryasri; Managerial economics and financial analysis, TMH, 2007.
2. Varshney & Maheswari: Managerial economics, sultan Chand, 2007.

#### REFERENCE BOOKS:

1. Ambrish Gupta, Financial accounting for management, Pearson education, New delhi,2007.
2. Shim & siegel :financial accounting (Schaum's Outlines), THM,2007.
3. Chary :Production and operations Management,THM,2007.
4. S.N.Maheswari & S.K.Maheshwari,financial accounting, Vikas ,2007.
5. Dwivedi : Managerial economics, 6<sup>th</sup> Ed., Vikas , 2007.

## **BTEIE407: TRANSDUCERS LAB**

**Lab : 3 Hrs/week**

**Credits : 2**

**Int Marks : 50**

**Ext Marks : 50**

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### **List of Experiments**

1. Extension of Range of DC Ammeter, Voltmeter.
2. Extension of Range of AC Ammeter, Voltmeter.
3. Construction of Series and Shunt type Ohm meters using PMMC
4. RLC and Q Measurement using Q-meter
5. Study of strain gauge using any one application
6. Measurement of temperature using RTD
7. Measurement of Linear Displacement using LVDT
8. Study of Capacitive Transducers.
9. Measurements of Resistance using Wheat Stone Bridge / Kelvin Bridge
10. Measurements of Capacitance using Shearing Bridge.
11. Measurements of Inductance using Maxwell's Bridge.
12. Characteristics of Opto – Electric Transducers (Photo Transistor, Photo Diode, LDR)
13. Piezoelectric Transducers
14. Bourdon tube.
15. Acceleration transducer.

**NOTE: Minimum 10 experiments should be conducted.**



## **BTEIE408: DATABASE MANAGEMENT SYSTEMS LAB**

**Lab : 3 Hrs/week**

**Credits : 2**

**Int Marks : 50**

**Ext Marks : 50**

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### **SQL**

- 1) Simple queries to understand DDL, DML and DCL commands. Apply different constraints with Create and Alter commands. Exercise on delete cascade and on update cascade clauses.
- 2) Perform Insert, delete and update operations based on conditions.
- 3) Different ways of performing Join.
- 4) Set operations and sub queries.
- 5) Exercise Aggregate Functions using Group By, Having and Order By clauses
- 6) Creation and dropping of Views.
- 7) Demonstration of operators in SQL.
- 8) Queries to demonstrate Conversion Functions, String Functions, Date Functions and Numeric Functions.
- 9) Creation of Synonyms, Sequences and Indexes.
- 10) Granting and Revoking of privileges.

### **PL/SQL**

- 1) Simple programs to understand PL/SQL
- 2) Write a PL/SQL program to demonstrate exception–handling
- 3) Demonstrate the working of Commit, Rollback and Savepoint in PL/SQL block.
- 4) Develop a program that includes the features Nested If and Case expression.
- 5) Program development using While loops, For loops
- 6) Programs using Cursors
- 7) Programs development using creation of procedures and functions.
- 8) Working of Triggers.

### **REFERENCES:**

1. Oracle: The Complete Reference by Oracle Press
2. Rick F Vander Lans, “Introduction to SQL”, Fourth Edition, Pearson Education, 2007.
3. Fundamentals of Database System, Elmasri, Navathe, Pearson Education.
4. Oracle PL/SQL for Dummies, Michael Rosenblum, Paul Dorsey, Wiley Publications.
5. Microsoft Virtual Academy- [mva.microsoft.com](http://mva.microsoft.com)