Multidisciplinary Courses (MDC)

Course Code	Course Name	Level	L	T	P	C	CIE	SEE	Total	Pre-requisite
2501EE01	Basic Electrical & Electronics Engineering	FC	2		2	4	50	50	100	-
2501MB02	Engineering Economics	IC	3			3	50	50	100	-
2501MB03	Management Science	AC	2			2	50	50	100	-
	Total		**7**		**2**	**9**				

Basic Electrical & Electronics Engineering

Course Code	2501EE01	L	T	P	C
		2	0	2	4

Course Outcomes:
At the end of the course, student will be able to:

CO 1: Analyze the concepts associated to AC and DC circuits.
CO 2: Explain the operating principles of motors, generators and measuring instruments.
CO 3: Analyze the Different Energy Resources and Equipment Safety Measures.
CO 4: Explain the concept and the applications of semiconductor Diodes.
CO 5: Analyze the basic electronic circuits and interpret numeric information in different code formats.

Mapping of course outcomes with program outcomes:

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	3	1	-	1	-	-	-	2	2	-
CO2	2	3	1	-	-	-	-	-	2	2	-
CO3	3	2	1	-	-	-	-	-	2	2	-
CO4	3	2	1	-	-	-	-	-	2	2	-
CO5	3	2	1	-	-	-	-	-	2	2	-

Mapping of course outcomes with program Specific Outcomes:

CO\PSO	PSO1	PSO2
CO1	**1**	-
CO2	**1**	-
CO3	**1**	-
CO4	**1**	-
CO5	**1**	-

UNIT-I:
DC and AC Circuits:
DC circuits: Ohm's and Kirchhoff's laws, analysis of series, parallel and series-parallel circuits excited by independent voltage sources for R, L, C parameters, current division, voltage division
AC circuits: Generation of sinusoidal voltage, frequency of generated voltage, average value, RMS value, form, and peak factors. Real power, reactive power, apparent power, and Power factor.
PRACTICE:
1. Verification of Ohm's Law.
2. Verification of KCL and KVL.
3. Verification of KCL, KVL and ohm's law using simulation.

UNIT-II:

Machines and Measuring Instruments:

Principles and operation of DC machines, Transformers – Synchronous Machines - three Phase and single-phase induction motors - Moving coil and moving iron instruments, Wheatstone bridge and Megger.

PRACTICE:

1. To study Magnetization Characteristics of DC shunt generator
2. Measurement of Power and Power factor using Single-phase wattmeter
3. Measurement of Resistance using Wheat stone bridge
4. Measurement of Earth Resistance using Megger.

UNIT-III:

Energy Resources, Electricity Bill and Safety Measures

Conventional and non-conventional energy resources; Layout and operation of various Power Generation systems: Hydel, Thermal, Solar and Wind power generation. Calculation of electricity bill for domestic appliances. Working principle of Fuse and Miniature circuit breaker (MCB). Electric Shock, Earthing and its types, Safety Precautions to avoid shock.

PRACTICE:

1. Calculation of Electrical Energy for Domestic Premises

UNIT-IV:

SEMICONDUCTOR DEVICES

Intrinsic semiconductors – Extrinsic semiconductors - P type and N type - P-N junction characteristics of P N Junction Diode — Zener Effect — Zener Diode and its Characteristics. working of simple zener voltage regulator and amplifier- Bipolar Junction Transistor — CB, CE, CC Configurations and Characteristics.

PRACTICE:

1. Sketch the V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.
2. Sketch the V-I characteristics of Zener Diode and its application as voltage Regulator
3. Plot Input and Output characteristics of BJT in CE and CB configurations.
4. Obtain Frequency response of CE amplifier.

UNIT-V:

BASIC ELECTRONIC CIRCUITS

Block diagram description of a dc power supply, working of a half and full wave, bridge rectifier, filters.

DIGITAL ELECTRONICS

Overview of Number Systems, Logic gates including Universal Gates, BCD codes, Excess-3 code, gray code, Hamming code. Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR. Simple combinational circuits–Half and Full Adders

PRACTICE:

1. Implementation of half wave and full wave rectifiers.
2. Design Half Adder and Full Adder circuits.
3. Verification of truth table for Logic gates using ICs.

Text Books:

1. “Basic Electrical and Electronics Engineering”, Salivahanan S, Tata McGraw Hill Education (India) Private Limited, New Delhi (ISBN: 9789389691801).
2. “Principles of Electrical Engineering”, V. K. Mehta, R. Mehta, S. Chand and Company Ltd., New Delhi (ISBN-13: 9788121930888).
3. “Digital Fundamentals”, Thomas Floyd, Prentice Hall, 10th Edition (ISBN: 9780132737968).

Reference Books:

1. "Electronic Devices and Circuit Theory", Robert L. Boylestad and Louis Nashelsky, 11/e Pearson (ISBN: 9780135026496).
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai and Co (ISBN: 9788177000207).

Web Links:

1. https://nptel.ac.in/courses/108/101/108101091/ (NPTEL Video by Dr.Mahesh B. Patil from IIT Bombay)
2. https://nptel.ac.in/courses/117/106/117106108/ (NPTEL Video by Prof. Nagendra Krishnapura from IIT Madras)

Engineering Economics
(Common to ECE, PT & Min.E)

	L	T	P	C
Course Code: 2501MB02	**3**	**0**	**0**	**3**

Course Outcomes:
At the end of the course, student will be able to:

- **CO1:** Explain the Managerial Economic concepts and Illustrate the law of demand forecasting methods.
- **CO2:** Identify the production , cost behavior for managerial decision making and Break Even Point (BEP) of an enterprise.
- **CO3:** Differentiate types of market structures, business organizations along with basic knowledge on business cycle.
- **CO4:** Make use of the process & principles of accounting for the preparation of basic accounts.
- **CO5:** Utilize various techniques on investment project proposals with the help of capital budgeting techniques for decision making.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1	-	-	1	-	1	-	-	-	2	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-
CO3	1	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	1	-	-
CO5	-	-	-	-	-	-	-	-	3	-	2

UNIT – I
Introduction to Managerial Economics and demand Analysis: Definition and Scope of Managerial Economics, Concept and determinants of demand, Demand curve, Law of Demand and its limitations, Elasticity of demand and its types, Demand forecasting and its Methods.

UNIT – II
Production and Cost Analyses: Concept of production function – Law of variable proportions-Isoquants and Iso costs- cost concepts: opportunity costs, explicit and implicit costs- Fixed costs, Variable costs and total costs – Cost –Volume-Profit analysis-Determination of breakeven point (simple problems)- Managerial significance and limitations of breakeven point.

UNIT – III
Introduction to Markets, Pricing Policies & Types of Business Organization and Business Cycles.
Market structures: Perfect competition, monopoly, monopolistic competition and oligopoly –Features – Methods of pricing: Average cost pricing, Limit pricing, Market skimming pricing. Features and evaluation of Sole Trader, Partnership, Joint Stock Company – Business cycles : Phases of business cycles.

UNIT – IV

Introduction to Accounting & Financing Analysis: Introduction to double entry systems – Journal entries – Ledger – Trail balance – Trading and Profit and Loss account-simple problem.

UNIT – V

Capital and Capital Budgeting:Capital Budgeting: Meaning of Capital- Methods of Capital Budgeting-Traditional Methods(pay back period, accounting rate of return) and modern methods(Discounted cash flow method, Net Present Value. method, Internal Rate of Return Method and ProfitAbility Enhancement Courses Index)- Simple Problems.

Text Books:

1. Managerial Economics and Financial Analysis, A.R. Aryasri , McGrawHill Education. ISBN: 978-0070078031
2. Managerial Economics and Financial Analysis, N.Appa Rao, P.Vijay Kumar, Cengage Publications. ISBN: 978-8131515952

Reference Books:

1. Managerial Economics , V. Maheswari , Sultan Chand Publications. ISBN: 81-8054-914-4
2. Managerial Economics, Suma Damodaran : Oxford University Press. ISBN: 978-0198061113

Web Links:

1. https://www.udemy.com/course/introduction-to-managerial economics/?couponCode=LETSLEARNNOWPP
2. https://archive.nptel.ac.in/courses/110/101/110101149/

Management Science
(Common to ECE & PT)

	L	T	P	C
Course Code: 2501MB03	**2**	**0**	**0**	**2**

Course Outcomes:
At the end of the course, student will be able to:

- **CO1:** Apply management and motivation theories to renovate the practice of management.
- **CO2:** Explain concepts of quality management and use process control charts, concepts and tools of quality engineering in the design of products and process controls.
- **CO3:** Appraise the functional management challenges associated with high levels of change in the organizations.
- **CO4:** Identify activities with their interdependency and use scheduling techniques of project management PERT/CPM.
- **CO5:** Develop global vision and management skills both at strategic level and interpersonal level.

Mapping of Course Outcomes with Program Outcomes:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
CO1	-	-	-	-	-	-	-	-	-	-	2
CO2	-	-	-	-	-	-	-	-	-	-	
CO3	-	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-		2	-	-	-
CO5	-	-	-	-	-	-	1	-	-	-	-

UNIT – I
Introduction to Management: Concept nature and importance of management, Generic functions, Principles and Types of Management, Theories of motivation, Decision making process, Designing organization structure.

UNIT – II
Operations Management: Work study, Statistical quality control, Control charts (P-chart, R-chart, and C-chart), Need for inventory control, EOQ, ABC analysis, and Types of ABC analysis (HML, SDE, VED, and FSN analysis).

UNIT – III
Functional Management: Concept of HRM, HRD and PMIR, Functions of HR Manager, Job evaluation and merit rating, Marketing management, functions of marketing, channels of distributions.

UNIT – IV
Project Management: Development of Network, Difference between PERT and CPM, Identifying critical path, (Simple Problems).

UNIT – V
Strategic Management: Vision, Mission, Goals, Strategy, Elements of corporate planning process, SWOT analysis, Steps in strategy formulation and implementation.

Text Books:

1. Management Science, Aryasri, Tata McGraw Hill. ISBN: 9780070090279
2. Management, James Arthur, Finch Stoner, R. Edward Freeman, and Daniel R, Pearson Education/Prentice Hall, 6th Edition.ISBN: 9788131707043

Reference Books:

1. Principles of Marketing, , Kotler Philip, Gary Armstrong, Prafulla Y. Agnihotri, and Eshan ul Haque , Pearson Education/ Prentice Hall of India 13th Edition. ISBN: 9788131731017
2. A Handbook of Human Resource Management Practice, Michael Armstrong, Kogan Page Publishers. ISBN: 978-1789661033

Web Links:

1. https://archive.nptel.ac.in/courses/122/106/122106031/
2. https://www.google.com/search?sca_esv=680b12c94771f77f&sca_upv=1&rlz=1C1VDKB_enGBIN1079IN1079&tbm=vid&sxsrf=ADLYWIKvg0FuUABCxWsswlpWIfSE3hFy0A:1716531957118&q=management+science+online+video+lectures&sa=X&ved=2ahUKEwissbLs06WGAxVX2.wGHYpkDOMQ8ccDegQIExAF