Open Elective-IV

1. Managerial Economics & Financial Analysis
2. Intellectual Property Rights
3. Design Thinking
4. Vedic Mathematics
5. Material Science
6. Electronic Principles
7. Quality Engineering
8. Conventional and Renewable Energy Resources
9. Indian Knowledge Systems

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Semester	VII				
Course code					
Category	Open Elective Courses				
Course title	Managerial Economics and Financial Analysis				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Classwork	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: The examiner will set nine questions in total. Question one will be compulsory. Question one will have seven parts of 2 marks each from all units, and the remaining eight questions of 14 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, the first being compulsory and selecting one from each unit.

COURSE OBJECTIVES:

The main objectives of the course are:

1. To enable the student to understand and appreciate, with a practical insight, the importance of certain basic issues governing the business operations that are needed for sound economic decision-making.
2. To provide inputs on an overall analysis of an individual firm, its production function, cost analysis and break-even-point
3. To make students understand different market structures, pricing of the product or services and different forms of business organizations.
4. To understand capital requirements of the business and basic rule of accounting of the business.
5. To learn analytical techniques and arriving at conclusions from financial information for the purpose of business decision-making.

COURSE OUTCOMES:

Following are the course outcomes:

CO1. Makes students understand the concepts and applications of managerial economics in taking business decisions.

CO2. Empowers students to comprehend with the production process and technical relationship among factors of production, different cost concepts and optimization of cost.

CO3. Enables students to know the classification of markets and how firms determine their price output decisions in different kinds of markets with different forms of business.

CO4. Allows students to know different sources of capital for the business and how financial accounting is done for smooth business functioning.

CO5. Equips students with different financial analysis tools and techniques to evaluate financial performance of the business.

UNIT-I

Introduction to Managerial Economics: Definition, Nature and Scope of Managerial Economics, Micro and Macroeconomic Concepts.

Demand Analysis: Demand Determinants, Law of Demand and 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, Expert Opinion, Test Marketing, Controlled Experience, Judgemental Approach, and Time Series Analysis).

UNIT-II

Production & Cost Analysis: Production Function- Isocost and Isoquants, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production Function, Laws of Returns, Internal and External Economies of Scale.
Cost Analysis: Cost Concepts. Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems)

UNIT-III

Markets: Types of Competition and Markets, Features of Perfect Competition, Monopoly and Monopolistic Competition;
Pricing Objectives, Methods of Pricing;
Business: Features of different forms of Business Organisation (Sole Trader, Partnership, Joint Stock Company, Cooperative Society, and Public Enterprises).

UNIT-IV

Introduction to Capital and Financial Accounting: Need for Capital, Types of Capital, Working Capital Analysis, Methods and Sources of raising Finance.
Accounting: Definition, Concepts and Conventions (GAAP); Accounting Cycle; Formats for preparation of Trial Balance and Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet).

UNIT-V

Investment Decision: Capital Budgeting - Features, Objectives, and Methods (Payback Method, Accounting Rate of Return and Net Present Value) - advantages & disadvantages. (Simple Problems)
Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, Capital Structure Ratios and Profitability Ratios. (Simple Problems)

TEXT BOOKS

1. Managerial Economics & Financial Analysis, Special Edition-MRCET. McGraw Hill Publications, 2017
2. D.N. Dwivedi, Managerial Economics, Vikas Publications.
3. Justin Paul, Leena, Sebastian, Managerial Economics, Cengage
4. P. L. Mehta, Managerial Economics: Analysis, Problems and Cases, Sultan Chand & Sons.
5. S. N. Maheswari & S. K. Maheswari, Financial Accounting, Vikas Publications.
6. M. Y. Khan and P. K. Jain, Financial Management, McGraw Hill

INTELLECTUAL PROPERTY RIGHTS

Semester	VII				
Course code					
Category	Open Elective Courses				
Course title	Intellectual Property Rights				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Classwork	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: The examiner will set nine questions in total. Question one will be compulsory. Question one will have seven parts of 2 marks each from all units, and the remaining eight questions of 14 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, the first being compulsory and selecting one from each unit.

COURSE OBJECTIVES

1. To understand the concepts IPR
2. To understand Trademarks, Trade Secretes and GI of goods.
3. To understand Copyrights, Patents and Industrial Designs.
4. To learn about how to manage IP rights and legal aspects.
5. To understand the concepts of Cyber laws in IPR.

COURSE OUTCOMES:

CO1. Learner should be able to demonstrate understanding of basic concepts of IPR.
CO2. Able to differentiate between Trademarks, Trade secrets and GI of goods.
CO3. Able to understand Copyrights, Patents and Industrial Designs.
CO4. Able to manage and protect IP
CO5. Will gain Knowledge on Cyber law

UNIT – I

Introduction: Introduction to Intellectual Property Rights, types of intellectual property, importance of intellectual property rights, Evolution of IP acts and treaties (WIPO & TRIPS), Agencies responsible for IPR registrations, Role and value of IP in international commerce, Issues affecting IP internationally.

UNIT – II

Trade Marks: Purpose and function of trademarks, Acquisition of trade mark rights, transfer of rights, Selecting and evaluating trademark, registration of trademarks, claims.

Trade Secrets: Trade secret law, determination of trade secret status, liability for misappropriation of trade secrets, trade secret litigation.

Geographical Indications of Goods: Basic aspects and need for the registration

UNIT – III

Copyrights: Fundamentals of copyright law, originality of material, right of reproduction, right to perform the work publicly, copyright ownership issues, notice of copyright.

Patents: Foundation of patent law, patent searching process, Basic Criteria of Patentability

Industrial Designs: Kind of protection provided in Industrial design

UNIT – IV:

Managing IP Rights: Acquiring IP Rights: letters of instruction, joint collaboration agreement, **Protecting IP Rights:** non disclosure agreement, cease and desist letter, settlement memorandum. **Transferring IP Rights**: Assignment contract, license agreement, deed of assignment

UNIT- V

Introduction to Cyber law: Information Technology Act, cyber crime and e-commerce, data security, confidentiality, privacy, international aspects of computer and online crime.

TEXT BOOKS:

1. Intellectual property right by Deborah E Bouchoux
2. Cyber law, Text and cases South western special topics collection.
3. Intellectual property rights by N.K Acharya
4. Fundamentals of IPR for engineers, BY komal bansal

REFERENCES:

Intellectual property rights by P. Radhakrishnan.

DESIGN THINKING

Semester	VII				
Course code					
Category	Open Elective Courses				
Course title	Design Thinking				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Classwork	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: The examiner will set nine questions in total. Question one will be compulsory. Question one will have seven parts of 2 marks each from all units, and the remaining eight questions of 14 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, the first being compulsory and selecting one from each unit.

COURSE OBJECTIVES:

1. To understand the engineering design process and identification of customer need.
2. To understand innovative problem solving concepts.

3. To understand the principles of Design for Manufacturing and FMEA.
4. To know about the design for assembly principles.
5. To know about the concepts of design for environment and design for recycling.

COURSE OUTCOMES:

CO1: The importance of design in innovation.
CO2: Design tools and processes can generate innovative new ideas.
CO3: Design and design thinking to innovative in areas such as engineering, software development and business operations.
CO4: Strengthen students' individual and collaborative capabilities to identify customer needs, create sound concept hypotheses, collect appropriate data, and develop a prototype that allows for meaningful feedback in a real-world environment.
CO5: To describe the various case studies for design for environment.

UNIT-I

Introduction: Innovations in Design, Engineering Design Process, Prescriptive and integrative models of design, Design Review and societal considerations.

Identification of Customer Need: Evaluating Customer requirements and survey on customer needs, Conversion of customer needs into technical Specifications, Information sources.

UNIT-II

Theory of Inventive Problem solving (TRIZ), Creativity and Problem solving, Functional Decomposition of the problem for innovative concept development, Introduction to Axiomatic Design, Concept evaluation and decision making.

UNIT-III

Design for Manufacturing: Technical estimating, design of experiments, design for manufacturability, statistical process control, Introduction to FMEA (failure modes and effects analysis), and Case study of design for manufacturing: Manufacturing System Design Based on Axiomatic Design: Case of Assembly Line

UNIT-IV

Design for Assembly: Assembly Principles, Process, Worksheet, Assumptions. Case study of design for Assembly: Manufacturing System Design Based on Axiomatic Design: Case of Assembly Line

Design for Environment: Design for recycling; Design for disassembly, Design for energy Efficiency, Design for remanufacture, Design for disposability, Hazardous material minimization. Case study of design for Environment.

TEXT BOOKS:

1. Nigel Cross, Engineering Design Methods, John Wiley, 2009.
2. George E. Dieter, Engineering Design, McGraw-Hill, 2009.
3. GenrichAltshuller, The Innovation Algorithm, Technical Innovation Centre, 2011.

REFERENCE BOOKS

1. The Art of Innovation, by Tom Kelley.
2. Design Thinking, by Nigel Cross.

3. The Design of Business: by Roger Martin.

VEDIC MATHEMATICS

Semester	VII				
Course code					
Category	Open Elective Courses				
Course title	Vedic mathematics				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Classwork	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: The examiner will set nine questions in total. Question one will be compulsory. Question one will have seven parts of 2 marks each from all units, and the remaining eight questions of 14 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, the first being compulsory and selecting one from each unit.

Course Outcomes

CO 1: Develop the understanding of objectives and features of Vedic maths.
CO 2: Manage to solve various mathematical operations using Vedic sutras.
CO3: Recognize the inert potential of students
CO4: Improve their mathematical abilities to apply in various fields of computer science
CO5: Drastically enhance their academic performance to integrate the concepts of vedic mathematics in computer science

UNIT-I

Introductions & History of Vedic Mathematics, Introduction to Father of Vedic Mathematics "Jagatguru Bharti Krishan Tirthji" Multiplications-using Sutras- Ekanyunena Purvena, Ekadhikena Purvena, Nikhilam Navatahcarmam Dastah, Vertically & Crosswise, Sum of Products, Difference of products, Sum and difference of Products in arithmetic and algebra. Cross digit sum to check the answers of addition, multiplication and subtraction.

UNIT-II

Square using Sutras- Ekadhikena Purvena, Nikhilam Navatahcarmam Dastah, Duplex in arithmetic and Algebra, Sum of squared numbers, difference of squared numbers, Sum and difference of squared Numbers, Cube using Sutras-Nikhilam and Anurupyena, Contribution to Mathematics by Bhaskracharya-II

UNIT-III

Square root using Vilokanam and Duplex, Cube root upto 9 digits, divisibility by denominator ending digits 1, 3, 7 & 9, Division by Sutras-Paravartya, Ekadhikena, Nikhilam Navatahcarmam Dastah, Dhwajank having divisor upto 3 digits, Division of Algebraic Expressions having divisor linear and quadratic Contribution to Mathematics by Arybhatt

UNIT-IV

Solution of Simple equations, Solutions of simultaneous linear equations in two variables, factorization in arithmetic, factorization of quadratic and cubic expressions, Highest Common Factors

in arithmetic and algebraic expressions, Baudhyan Numbers.

TEXT BOOKS

1. Atul Gupta, The Power of Vedic Math, Jaico Publishing House
2. Vera E. Stevens, Pebble Maths: A new and successful way to teach Vedic Math to beginner learners of all ages and abilities, Pebble Maths Publishing House
3. Rajesh Kumar Thakur, The essentials of Vedic mathematics, Rupa Publications, India

MATERIAL SCIENCE

Semester	VII				
Course code					
Category	Open Elective Courses				
Course title	**Material Science**				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Classwork	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course objectives:

The course intends to provide the knowledge of

1. Crystal structure and defects in solids.
2. Classification of differentsolids.
3. Properties of semiconductor, dielectric and magnetic materials.

UNIT I

Crystal Structure Space lattice and translation vectors, Unit cell, Bravais lattice, Closed packed structures, Miller indices, Diffraction of electromagnetic waves by crystals: X-rays, electrons and neutrons, Bragg's law, X-ray diffraction (Laue and Powder method), Point defects in solids - Schottky and Frenkel defects.

UNIT II

Electrical Properties Classification of solids into conductors, semiconductors and insulators, Semiconductor Materials: intrinsic and extrinsic, Fermi level and electron & hole concentrations at equilibrium, Carrier transport: diffusion and drift, p-n junction, Zener and Avalanche breakdown.

UNIT III

Magnetic Properties Atomic magnetic moments and origin of magnetization, Types of magnetic materials, Ferromagnetism: molecular field, Curie temperature, Domain theory, Hysteresis and its applications. Superconductivity: Properties of superconductors, Meissner effect, London equations, Elements of BCS Theory, Applications of superconductors.

UNIT IV

Dielectric Properties Molecular theory, Polarization, Electric displacement vector, susceptibility, dielectric constant, permittivity and various relations between these parameters, Gauss's law in the presence of a dielectric, Energy stored in a uniform electric field, Concept of local molecular fields and Claussius - Mossotti relation.

Course outcome:

1. Segregate crystals based on their structure and apply effects of defects on manipulating properties of solids.
2. Distinguish between insulator, conductor and semiconductor. They should know the difference between intrinsic and extrinsic semiconductors and about the fermi level position in these semiconductors.
3. Select various dielectric, magnetic materials for specific applications in different fields.

Suggested reference books:

1. Concepts of Modern Physics- Arthur Beiser (TMGH)

2. Solid State Physics- S.O. Pillai (New Age Int. Ltd. Pub.)
3. Modern Physics for Engineers- S.P. Taneja (R. Chand)
4. Engineering Physics- Satya Prakash (Pragati Prakashan)
5. Engineering Physics- Malik & Singh (McGraw Hill)
6. Charles Kittel, Introduction to Solid State Physics, 7th Edition, John Wiley & Sons, 2008.
7. S O Pillai, Solid State Physics, 8th edition, New Age international Publishers,2018

ELECTRONIC PRINCIPLE

Semester	VII				
Course code					
Category	Open Elective Courses				
Course title	**Electronic Principle**				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Classwork	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Objective:
1. Study the basic principles of electronic systems.
2. Understand working of Digital electronics.
3. Understand the working of Display devices.

UNIT I

SEMICONDUCTOR DIODE: P-N junction and its V-I Characteristics, P-N junction as a rectifier, Switching characteristics of Diode. Diode as a circuit element, the load-line concept, half - wave and full wave rectifiers, clipping circuits, clamping circuits, filter circuits, peak to peak detector and voltage multiplier circuits.

UNIT II

ELECTRONIC DEVICES: LED, Zener Diode as voltage regulator, BJT, UJT, MOSFET, Thyristor, DIAC, TRIAC.

UNIT III

DISPLAY DEVICES: LED, LCD, Seven Segment, Sixteen Segment.

UNIT IV

DIGITAL ELECTRONICS: Binary, Octal and Hexadecimal number system and conversions, Boolean Algebra, Truth tables of logic gates (AND, OR, NOT) NAND, NOR as universal gates, Difference between combinational circuits and sequential circuits, Introduction to flipflops (S-R & J-K).

Course Outcomes:
1. Understand the working of electronic components.
2. Understand the Digital System and various displays.

TEXT BOOK/REFERENCES :
1.Integrated Electronics: Millman & Halkias ; McGrawHill
2. Modren Digital Electronics: R.P. Jain; McGraw-Hill
3. Electronics Principles: Malvino ; McGrawHill
4. Electronics Circuits: Donald L. Schilling & Charles Belove ; McGrawHill
5. Electronics Devices & Circuits: Boylestad & Nashelsky ; Pearson.

QUALITY ENGINEERING

Semester	VII				
Course code					
Category	Open Elective Courses				
Course title	**Quality Engineering**				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Classwork	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

UNIT I

Basic Concepts of Quality: Definitions of Quality and its importance in industry, Quality function, Quality Characteristics, Quality process, Quality Traits, Applications of Quality Concept, Introduction to quality control, Computer aided quality control, Total quality control(TQC) and its implementation, Elements of TQC, Quality Circle, Objectives of quality circle, Role of management in quality circle, Quality in service organizations, characteristics of a service organization, Important service dimensions, Design of service quality.

UNIT II

Basic Statistical Concepts: The Concept of variation, Distinction between variables and attributes data, The frequency distribution, graphical representation of frequency distribution, Quantitative description of distribution, the normal curve, concept of probability, laws of probability, probability distributions, hyper geometric distribution, binomial distribution, The Poisson distribution.

UNIT III

Quality systems: Quality systems, Need for quality System, Need for standardization, History of ISO:9000 series standards and its features, steps to registration, India and ISO:9000, Automated inspection systems technologies, Different forms of Inspection, Industrial inspection,

UNIT IV

Total Quality Management: Introduction to TQM, Concepts, Characteristics of TQM, Relevance of TQM, Approaches to TQM Implementation, TQM philosophies, Taguchi Philosphy, JIT, Kaizen, Six Sigma approach, 5-S approach

Course Outcomes:

Upon completion of this course the student will be able to:

1. Attain the basic techniques of quality improvement, fundamental knowledge of statistics and probability
2. Use control charts to analyze for improving the process quality.
3. Describe different sampling plans
4. Acquire basic knowledge of total quality management
5. Understand the modern quality management techniques

Text Books/References:

1. Quality planning and Analysis, Juran and Gryna, TMH, New Delhi
2. Quality Management, Kanishka Bed, Oxford University Press, New Delhi
3. Introduction to SQC, Montgomery DC, 3e, Wiley, New Delhi
4. Fundamentals of quality control and improvement, A Mitra, Mcmillan pub. Company, NY
5. Fundamentals of Applied Statistics, Gupta and Kapoor, Sultan Chand and Sons, New Delhi.

CONVENTIONAL AND RENEWABLE ENERGY RESOURCES

Semester	VII				
Course code					
Category	Open Elective Courses				
Course title	**Conventional and renewable energy resources**				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Classwork	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Course Objective:

1. The course will provide understanding of power generation technology using conventional and non-conventional energy sources which will be useful for understanding the operation and working of power plants.
2. Students will learn basics of Tariff structure for energy production.
3. Students will understand the operation, maintenance and working of substations.

UNIT I

INTRODUCTION: Energy sources, their availability, recent trends in Power Generation, Amount of generation of electric power from Conventional and non-conventionalsources of energy in Haryana, India and some developed countries of the world. Interconnected Generation of Power Plants.

UNIT II

POWER GENERATION PLANNING: Load forecasting, load curves, load duration curve, Base load and Peak load Power Plants, connected Load, maximum demand, demand factor, Group diversity factor, load factor, significance of load factor, plant factor, capacity factor, selection of unit size, No. of Units, reserves, cost of power generation, Depreciation, tariff.

UNIT III

CONVENTIONAL ENERGY SOURCES: Selection of site, capacity calculations, classification, Schematic diagram and working of Thermal Power Stations(TPS), Hydro Electric Plant and Nuclear Power Plant . NON-CONVENTIONAL ENERGY SOURCES: Selection of site, capacity calculations, Schematic diagram and working of Wind, Solar, fuel cell, Magneto Hydro Dynamic (MHD) system.

UNIT IV

ELECTRIC ENERGY CONSERVATION & MANAGEMENT: Energy management, Energy Audit, Energy Efficient Motors, Co-generation.

Course Outcomes:

After learning the course the students should be able to:

1. Describe the working of thermal power station using single line diagram and state the functions of the major equipment and auxiliaries of a TPS.
2. Explain hydro energy conversion process with block diagrams and identify the appropriate site for it.
3. Explain the working of Nuclear power station.
4. Describe the working of Solar Power station and wind power plant.
5. Compare various economic aspects of different types of Tariffs.
6. Classify various substations and describe working of its equipments.
7. Compare various generating systems.

TEXT BOOKS/REFERENCES:

1. Renewable Energy Sources and Emerging Technologies : D.P Kothari, K.C.Singla, Rakesh Ranjan- PHI Publications, 'Latest Edition'.
2.Electric Power Generation, B.R.Gupta, 'Latest Edition'.
3. Power Generation, Operation and Control, Wood and Wollenberg, John Wiley & Sons,'Latest Edition'.
4. A Course in Electric Power System, Soni, Gupta, Bhatnagar, Dhanpat Rai & Sons, 'Latest Edition'.
5. Power System Engineering, Nagrath & Kothari, Tata Mc-Graw Hill, New Delhi, 'Latest Edition'.
6. Power Plant Engg: G.D. Rai, 'Latest Edition'. 7. Electric Power: S.L. Uppal (Khanna Publishing), 'Latest Edition'.

INDIAN KNOWLEDGE SYSTEMS

Semester	VII				
Course code					
Category	Open Elective Courses				
Course title	**Indian knowledge systems**				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Classwork	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

UNIT -I: Bhāratīya Civilization and Development of Knowledge System:
Genesis of the land, Antiquity of civilization, On the Trail of the Lost River, Discovery of the Saraswatī River, the Saraswatī-Sindhu Civilization, Traditional Knowledge System, The Vedas, Main Schools of Philosophy (6+3), Ancient Education System, the Takṣaśilā University, the Nālandā University, Alumni, Knowledge Export from Bhārata

UNIT-II: Arts, Literature, and Scholars:
Art, Music, and Dance, Naṭarāja– A Masterpiece of Bhāratīya Art, Literature, Life and works of Agastya, Lopāmudrā, Ghoṣā, Vālmīki, Patañjali, Vedavyāsa, Yājňavalkya, Gārgī, Maitreyī, Bodhāyana, Caraka, Suśruta, Jīvaka, Nāgārjuna, Kaṇāda, Patañjali, Kauṭīlya, Pāṇini, Thiruvalluvar, Āryabhaṭa, Varāhamihira, Ādi Śaṅkarācārya, Bhāskarācārya, Mādhavācārya.

UNIT-III: Science, Astronomy, and Mathematics:
Concept of Matter, Life and Universe, Gravity, Sage Agastya's Model of Battery, Velocity of Light, Vimāna: Aeronautics, Vedic Cosmology and Modern Concepts, Bhāratīya Kāla-gaṇanā, Kerala School for Mathematics and Astronomy, History and Culture of Astronomy, Sun, Earth, Moon, and Eclipses, Earth is Spherical and Rotation of Earth, Archaeostronomy; Concepts of Zero and Pi, Number System, Pythagoras Theorem, and Vedic Mathematics.

UNIT-IV: Engineering, Technology, and Architecture
Pre-Harappan and Sindhu Valley Civilization, Laboratory and Apparatus, Juices, Dyes, Paints and Cements, Glass and Pottery, Metallurgy, Engineering Science and Technology in the Vedic Age and Post-Vedic Records, Iron Pillar of Delhi, Rakhigarhi, Mehrgarh, Sindhu Valley Civilization, Marine Technology, and Bet–Dwārkā, Ethnic Studies, Life Science in Plants, Anatomy, Physiology, Agriculture, Ecology and Environment, Āyurveda, Integrated Approach to Healthcare, Medicine, Microbiology, Medicine, Surgery, and Yoga, etc.

Text books:

1. Textbook on The Knowledge System of Bhārata by Bhag Chand Chauhan,
2. Histrory of Science in India Volume-1, Part-I, Part-II, Volume VIII, by Sibaji Raha, et al. National Academy of Sciences, India and The Ramkrishan Mission Institute of Culture, Kolkata (2014).

Reference Books:

1. Pride of India- A Glimpse of India's Scientific Heritage edited by Pradeep Kohle et al. Samskrit Bharati (2006).
2. Vedic Physics by Keshav Dev Verma, Motilal Banarsidass Publishers (2012).
3. India's Glorious Scientific Tradition by Suresh Soni, Ocean Books Pvt. Ltd. (2010).