Tripura University
(A Central University)

Curriculum

For

B. Tech in Mechanical Engineering

(4th Semester)

2021

4th SEMESTER

Sl. No.	Course Category	Subject Code	Subject Title	L	T	P	Contact Hours/week	Credit	Full Marks
1.	Humanities Science - 3	HU 401	Engineering Economics and Accountancy	3	0	0	3	3	100
2.	Humanities Science - 4	HU 402	Universal Human Values-II: Understanding Harmony	2	1	0	3	3	100
3.	Program Core - 6	PC ME 403	Thermal Engineering	3	1	0	4	4	100
4.	Program Core - 7	PC ME 404	Fluid Mechanics-II	3	1	0	4	4	100
5.	Program Core - 8	PC ME 405	Strength of Materials-II	3	0	0	3	3	100
6.	Program Core - 9	PC ME 406	Manufacturing Process - I	3	0	0	3	3	100
7.	Program Core - 10	PC ME 407	Strength of Materials Lab	0	0	2	1	1	100
8.	Program Core - 11	PC ME 408	Fluid Mechanics Lab	0	0	2	1	1	100
9.	Program Core - 12	PC ME 409	Manufacturing Lab	0	0	2	1	1	100
10.	Mandatory Course - 4	MC 410	Essence of Indian Knowledge Tradition	2	0	0	2	0	100
			Total:	19	3	6	28	**23**	**1000**

Engineering Economics and Accountancy

Course Code	HU 401
Course Title	Engineering Economics and Accountancy
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	Nil
Course Category	Humanities Science (HS)
Number of classes	38 hours

Course Outcomes:

At the end of the course, the student will be able to

CO Number	CO Description	K-level
CO-1	Understand the importance of engineering economics in business.	K-2
CO-2	Demonstrate the necessary knowledge and skills for running a business organisation.	K-2
CO-3	Understand the financial statement and position of an organisation.	K-2
CO-4	Analyze the accounting information for decision making.	K-4
CO-5	Develop the knowledge & skill on business and management.	K-3

Course Content:

Module 1: Engineering economics (9 hrs)

- Engineering economy and its importance;
- Demand & supply: Wants, satisfaction of wants, demand, supply, elasticity of demand, estimation of demand, supply chain economy;
- Production-Factors of production (land, labor, capital, and entrepreneurship), Laws of return.
- Money – Value of money, quantity theory; inflation and deflection.

Module 2: Business Skills for Engineers (9 hrs)

- Business Structure: Proprietorship, Partnership and Joint Stock Company;
- Basic management for businesses: Basic functions of management,
- Risk Management: Type of risk, Risk management steps
- Entrepreneur and Leadership: Leadership styles, Qualities of a good leader for a business;
- Financing and the business: Objectives and sources of funds;
- Taxation: Basics of Income tax & Goods and Services Tax (GST)

Module 3: Financial Accounting for Business (10 hrs)

- Transactions: Financial event, Features of transactions; Recording of transactions;
- Basic accounting: Ledger, Trail balance, Cash book (double column only);

- Final account: Objectives, Preparation of final accounts (Trading A/C, Profit & Loss A/C and Balance Sheet).

Module 4: Managerial Accounting for Decision-making (10 hrs)

- Cost classifications – Material cost control, labor cost control and overhead cost control (only theory);
- Cost sheet: Objective and preparation of Cost sheet (Basic problem);
- Capital budgeting: Objectives Pay-back period and NPV method for feasibility testing of investment
- Working capital management: Factors and sources of WC
- Ratio analysis: Interpretation for industrial control, Basic ratios- Current Ratio, Debt-equity ratio, proft ratio

References / Suggested Learning Resources:

- Fundamentals of Engineering Economics, 4th Edition, by Chan S. Park, Pearson Publishing;
- Engineering Economics And Financial Accounting Paperback, by Arasu, Scitech publication
- Engineering Economics and Financial Accounting for Anna University Paperback by A. Bagad,Technical Publications;
- Financial Management- An analytical framework , Nayak & Manna, Parul Library;
- Principles of Management, Ghose and Basu,ABS Publishing House;

****

Universal Human Values-II: Understanding Harmony

Course Code	HU-402
Course Title	Universal Human Values-II: Understanding Harmony
Number of Credits	3(L: 2, T: 1, P: 0)
Prerequisites	Induction Programme and Universal Human Values -I
Course Category	Humanities Science (HS)
Number of classes	36 hours

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

CO Number	CO Description	K-level
CO-1	Explain the term self-exploration and its application for self-evaluation and development.	K-2
CO-2	Identify the holistic perception of harmony at level of self, family, society, nature and explain it by various examples.	K-3
CO-3	Illustrate the role of a human being in ensuring harmony in society and nature.	K-2

CO-4	Distinguish between ethical and unethical practices, and start identifying a strategy to actualize a harmonious environment wherever they work.	K-4

Module1:CourseIntroduction-Need,BasicGuidelines,ContentandProcess for ValueEducation(8 Hrs)

Self-Exploration–whatisit?-Itscontentandprocess;'NaturalAcceptance'andExperientialValidation-astheprocessforself-exploration.
ContinuousHappinessandProsperity-AlookatbasicHuman Aspirations.
Rightunderstanding,RelationshipandPhysicalFacility-
thebasicrequirementsforfulfillmentofaspirationsofeveryhumanbeingwiththeircorrectpriority.
Understanding Happiness and Prosperity correctly- A critical appraisal of thecurrentscenario.
Methodtofulfilltheabovehumanaspirations:understandingandlivinginharmony atvariouslevels.

Module2:UnderstandingHarmonyintheHumanBeing(10 Hrs)

Understanding humanbeingasaco-existenceofthesentient'I'andthematerial'Body'.
UnderstandingtheneedsofSelf('I')and'Body'-happinessandphysicalfacility.
UnderstandingtheBodyasaninstrumentof'I'(Ibeingthedoer,seerand enjoyer).
Understandingthecharacteristicsandactivitiesof'I'andharmonyin'I'.
Understanding values in human-human relationship; meaning of Justice(nine universal values in relationships) and program for its fulfillment toensuremutualhappiness;TrustandRespectasthefoundationalvaluesofrelationship.
Understanding the meaning of Trust; Difference between intention andcompetence
Understanding the harmony in the society (society being an extension offamily): Resolution, Prosperity, fearlessness (trust) and co-existence ascomprehensiveHumanGoals.

Module 3: Understanding Harmony in the Nature and Existence - Wholeexistenceas Coexistence (8Hrs)

Understanding the harmony in the Nature Interconnectedness and mutual fulfillment among the four orders ofnature-recyclabilityandself-regulationinnature.
Understanding Existence as Co-existence of mutually interacting unitsinall-pervasivespace.
Holisticperceptionofharmonyatalllevelsofexistence.

Module4:ImplicationsoftheaboveHolisticUnderstandingofHarmonyonProfessionalEthics(10 Hrs)

Naturalacceptanceofhumanvalues.DefinitivenessofEthicalHumanConduct.
BasisforHumanisticEducation,HumanisticConstitutionandHumanisticUniversal
Order.Competenceinprofessionalethics:
a.Ability to utilize the professional competence for augmenting universal human order

b.Ability to identify thescopeandcharacteristicsofpeoplefriendlyandeco friendlyproductionsystems,
c.Abilitytoidentifyanddevelopappropriatetechnologiesandmanagementpatternsfor above production systems.

References / Suggested Learning Resources:

1.HumanValuesandProfessionalEthicsbyRRGaur,RSangal,GPBagaria, ExcelBooks,New Delhi,2010

2.Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan,Amarkantak, 1999.

3. HumanValues,A.N.Tripathi,NewAgeIntl.Publishers,NewDelhi,2004.

4. TheStoryofMyExperimentswithTruth-byMohandasKaramchandGandhi.

5. BharatMeinAngrejiRaj-PanditSunderlal

6.RediscoveringIndia-byDharampal

7.HindSwarajor Indian HomeRule- by MohandasK.Gandhi

8.IndiaWinsFreedom-MaulanaAbdulKalamAzad

9.Vivekananda-RomainRolland(English)

10.Gandhi-RomainRolland(English)

****

Thermal Engineering

Course Code	PC ME 403
Course Title	Thermal Engineering
Number of Credits	4 (L: 3, T: 1, P: 0)
Prerequisites	Thermodynamics
Course Category	Program Core (PC)
Number of classes	48 hours

Course Outcome:

After completing this course, the students will be able to

CO Number	CO Description	K-level
CO-1	Distinguish fuels and comprehend Air standard cycles.	K2
CO-2	Asses the refrigeration cycles and pschyrometry.	K3
CO-3	Articulate and test nozzle, diffuser theoretically.	K4
CO-4	Evaluate reciprocating compressors and steam turbines.	K5

Course Content:

Module 1: Fuels and Air standard cycles:(14 hours)

Introduction to solid, liquid and gaseous fuels–Stoichiometry, exhaust gas analysis- First law analysis of combustion reactions- Heat calculations using enthalpy tables- Adiabatic flame temperature- Chemical equilibrium and equilibrium composition calculations using free energy.

Air standard Otto, Diesel and Dual cycles-Air standard Brayton cycle, effect of reheat.

Module 2: Vapor power cycles, refrigeration cycles and pschyrometry:(14 hours)
Vapor power cycles Rankine cycle with superheat, reheat and regeneration, exergy analysis. Supercritical and ultra super-critical Rankine cycle- Gas power cycles, regeneration and intercooling- Combined gas and vapor power cycles- Vapor compression refrigeration cycles, refrigerants and their properties.Properties of dry and wet air, use of pschyrometric chart, processes involving heating/cooling and humidification/dehumidification, dew point.

Module 3: Basics of compressible flow, nozzle and diffuser: (10 hours)
Basicsof compressible flow. Stagnation properties, Isentropic flow of a perfect gas through a nozzle, choked flow, subsonic and supersonic flows- normal shocks- use of ideal gas tables for isentropic flow and normal shock flow- Flow of steam and refrigerant through nozzle,supersaturation, compressible flow in diffusers, efficiency of nozzle and diffuser.

Module 4: Compressors and steam turbines: (10 hours)

Reciprocating compressors, staging of reciprocating compressors, optimal stage pressure ratio, effect of intercooling, minimum work for multistage reciprocating compressors. Analysis of steam turbines, velocity and pressure compounding of steam turbines.

References / Suggested Learning Resources:
1. Sonntag, R. E, Borgnakke, C. and Van Wylen, G. J., 2003, 6th Edition, *Fundamentals of Thermodynamics*, John Wiley and Sons.
2. Jones, J. B. and Duggan, R. E., 1996, *Engineering Thermodynamics*, Prentice-Hall of India.
3. Moran, M. J. and Shapiro, H. N., 1999, *Fundamentals of Engineering Thermodynamics*, John Wiley and Sons.
4. Nag, P.K, 1995, *Engineering Thermodynamics*, Tata McGraw-Hill Publishing Co.Ltd.
5. YunusA.Cenegal and Michael A.Boles, 2002, *Thermodynamics- An Engineering Approach,* Tata McGraw Hill publications.

****

FLUID MECHANICS-II

Course Code	PC ME-404
Course Title	Fluid Mechanics-II
Number of Credits	4 (L: 3, T: 1, P: 0)
Prerequisites	Engineering Physics & Mathematics and Fluid Mechanics-I
Course Category	Program Core (PC)
Number of classes	48 hours

Course Outcome:
After completing this course, the students will be able to

CO Number	CO Description	K-level
CO-1	Describe various losses associated with flow through pipes andexplain dimensions for fluid properties, model laws	K2
CO-2	Solve problems related to flow in open channel	K3
CO-3	Explain boundary layer theory and forces on submerged bodies.	K4

CO-4	Evaluate basic principles and problems related to compressible flow and gas dynamics.	K5

Course Content:

Module 1: Flow through pipes, dimensions and models: (10 hours)

Major and minor losses of energies in pipes, Hydraulic gradient and total energy lines, flow through pipes in series, equivalent pipe, Flow through parallel pipes, Power transmission through pipes and nozzles, water hammer.

Dimensions of fundamental and derived quantities, Dimensional Homogeneity,Simlitude, dimensionless, Model Laws, classification of models.

Module 2: Flow in open channel: (10 hours)

Uniform flow through open channels, Chezy's formula, Most economical sections of channel. Non-uniform flow-specific energy and specific energy curve, critical depth and critical velocity, minimum specific energy, hydraulic jump.

Module 3: Boundary layer theory, drag and lift: (14 hours)

Laminar and Turbulent boundary Layer thickness, Vonkarman's momentum equation, Total drag due to Laminar and turbulent layers on flat plate, separation of boundary layer and it's control.

Drag and lift on a stationary body by flowing fluid, expression for drag and lift and dimensional analysis, stream lined and Bluff bodies, Drag on a sphere and cylinder, Terminal velocity of a body, lift on a airfoil.

Module 4: Compressible flow: (14 hours)

Introduction to Compressible flow,Thermodynamic relations, continuity equation, Bernoulli's equation and momentum equation, velocity of sound in fluid, Mach no. propagation of pressure waves in a compressible fluid-Mach angle, zone of action and silence, stagnation properties, Area-velocity relationship for compressible flow, flow of compressible fluid through nozzles maximum mass flow rate and it's variation, mass flow rate of compressible fluid through venturimeter, pito-static tube. Normal and oblique shock waves.

References / Suggested Learning Resources:

1. Som, S. K., & Biswas, G. Introduction to fluid mechanics and fluid machines: Tata McGraw-Hill.
2. Cengel, Y., Fluid Mechanics, Tata McGraw-Hill.
3. Bansal, R. K. A textbook of fluid mechanics and hydraulic machines, Laxmi Pub.
4. Rajput, R.K., A Textbook of Fluid Mechanics and Fluid Machines, S. Chand Pub.
5. Kumar, D.S., Fluid Mechanics and Fluid Power Engineering, S.K.Kataria& Sons.
6. NPTEL courses: http://nptel.iitm.ac.in/courses.php - web and video resources on Fluid Mechanics.

****

Strength of Materials-II

Course Code	PC ME 405
Course Title	Strength of Materials-II
Number of Credits	3 (L: 3, T: 0, P: 0)
Prerequisites	---
Course Category	ProgramCore (PC)
Number of classes	36 hours

Course Outcome:-

After completion of the course, students will be able to:

CO No	CO Description	K-level
CO-1	Explain effects of slope and deflection on beams and design beams considering slope and deflection.	
CO-2	Design a part subjected to the torsion.	
CO-3	Design simple thick and thin cylinders.	
CO-4	Design column and struts under different loading condition.	

Module 1:Slope and deflection: (9 Hrs.)
Introduction ,Deflection and slope of a beam subjected to bending Moment, relation between slope ,deflection and radius of curvature deflection of cantilever for various types of loading, deflection of simply supported beam for various types of loading. Conjugate beam method.

Module 2:Torsion: (9 Hrs.)
Derivation of torsion equation and its assumptions. Applications of the equation of the hollow and solid circular shafts, torsional rigidity. Combined torsion and bending of circular shafts, principal stress and maximum shear stresses under combined loading of bending and torsion.

Module 3: Thin Cylinders and Thick cylinders: (9 Hrs.)
Thin Cylinders and Spheres- Derivation of formulae and calculations of hoop stress, longitudinal stress in a cylinder, and sphere subjected to internal pressures. Thick cylinders – Lame's equation, shrink fit. Compound cylinders.

Module 4:Columns and Struts: (9 Hrs.)
Introduction, failure of a column , basic assumptions, different end conditions, expression for crippling for different end conditions Effective length of a column. Slenderness ratio, Limitations of Euler's formula, Rankine's formula, factor of safety.

References/ Suggested Learning Resources:-

1. Pytel A H and Singer F L, Strength of Materials, Harper Collins.
2. Dr. R K Bansal, Strength of Materials, Laxmi Publications (P) Ltd.
3. Timoshenko S P and Young D H, Elements of Strength of Materials, East West Press.
4. Beer P F and Johston (Jr) E R, Mechanics of Materials: SI Version, McGraw Hill.
5. Shames, I. H., Pitarresi, J. M., Introduction to Solid Mechanics, Prentice-Hall.
6. Khurmi, R.S., Strength of Materials, S.Chand and Co, Revised edition.
7. NPTEL courses, http://nptel.iitm.ac.in/courses.php, web and video courses on Strength of Materials by Prof. Sharma, S. C., and Prof. Harsha, S. P.
8. Nash W., Strength of Materials Schaum's out line series, Mc Graw Hill.
9. Subramanian, R., Strength of Materials, Oxford University Press, New Delhi.
10. Punmia, Mechanics of Materials, Laxmi Publications.

Manufacturing Process - I

Course Code	**PC ME 406**
Course Title	**Manufacturing Process - I**
Number of Credits	**3 (L: 3, T: 0, P: 0)**
Prerequisites	**Nil**
Course Category	**Program Core (PC)**
Number of classes	**36 hours**

Course Outcome:

	At the end of the course, the student will be able to:	
CO1	Explain the fundamentals of primary shaping processes	K2
CO2	Calculate the cutting forces during material removal processes.	K3
CO3	Design differentwelding joints.	K4
CO4	Calculate material removal rate(MRR) during unconventional machining	K3

Course Content:

Module 1: Conventional Manufacturing processes:(09 hours)

Casting and moulding: Metal casting processes and equipment, Heat transfer and solidification,shrinkage, riser design, casting defects and residual stresses.Introduction to bulk and sheet metal forming, plastic deformation and yield criteria; **Mechanical Working of Metals**:fundamentals ofhot and cold working processes; load estimation for bulk forming(forging, rolling, extrusion,drawing) and sheet forming (shearing, deep drawing, bending)principles of powder metallurgy.

Module 2:Machining Processes:(09 hours)

Metal cutting: Single and multi-point cutting; Orthogonal cutting, various force components: Chipformation, Tool wear and tool life, Surface finish and integrity, Machinability, cutting tool materials,Cutting fluids, Coating; Turning, Drilling, Milling and finishing processes, Introduction to CNCmachining. **(8)**

Module 3: Joining and Fabrication Processes:(07 hours)

Additive manufacturing: Rapid prototyping and rapid tooling**.Joining/fastening processes:** Physics of welding, brazing and soldering;design considerations inwelding,Solid and liquid state joining processes;Adhesive bonding.

Module 4:Unconventional Machining Processes:(11 hours)

Abrasive Jet Machining, Water Jet Machining, Abrasive Water Jet Machining, UltrasonicMachining, principles and process parameters. Electrical Discharge Machining, principle and processes parameters, MRR, surface finish, tool wear,dielectric, power and control circuits, wire EDM; Electro-chemical machining (ECM), etchant&maskant, process parameters, MRR and surface finish.Laser Beam Machining (LBM), Plasma Arc Machining (PAM) and Electron Beam Machining.

References / Suggested Learning Resources:

1. Kalpakjian and Schmid, Manufacturing processes for engineering materials (5th Edition)-PearsonIndia, 2014
2. Mikell P. Groover, Fundamentals of Modern Manufacturing: Materials, Processes, and Systems

3. Degarmo, Black &Kohser, Materials and Processes in Manufacturing.
4. Manufacturing Technology by P.N. Rao., McGraw HILL INDIA.
5. Materials and Manufacturing by Paul Degarmo.
6. Manufacturing Processes by Kaushish, PHI.
7. Principles of Foundry Technology, Jain, MCGRAW HILL INDIA.
8. Production Technology by RK Jain.

****

Strength of Materials Lab

Course Code	PC ME 407
Course Title	Strength of Materials Lab
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	---
Course Category	ProgramCore (PC)
Number of classes	24 hours

Course Outcome:-

After completion of the course, students will be able to:

CO No	CO Description	K-level
CO-1	Perform Tension, shear and torsion test on solid materials	K3
CO-2	Determine the Toughness of the material using CHARPY and IZOD Test.	K4
CO-3	Determine the Brinnell and Rockwell hardness number of the given specimen.	K4
CO-4	Estimate the elastic constants through compression test on springs and deflection test on beams	K4

List of Experiments *(Minimum 6 experiments to be performed).*

Sl. No.	Practical Exercises
1.	To study the Brinell Hardness testing machine and the Brinell hardness test.
2.	2. To study the Rockwell Hardness testing machine and perform the Rockwell hardness test.
3.	3. To study the Vickers Hardness testing machine and perform the Vickers hardness test.
4.	4. To study the Impact Testing machine and Perform Izod impact test.
5.	To study the Impact Testing machine and Perform charpy impact test.
6.	To study the UTM and perform the tensile test.
7.	To Perform compression test on UTM.
8.	To perform the bending test on UTM.
9.	To perform the shear (both single and double) test on UTM.
10.	Torsion test on mild steel rod.

References/ Suggested Learning Resources:-

1. Khurmi, R S, Strength of Materials, S. Chand and Co.

2. Hatt , W.K., Laboratory Manual of Testing Materials.

3. Dr. R K Bansal, Strength of Materials, Laxmi Publications (P) Ltd.

4.Timoshenko S P and Young D H, Elements of Strength of Materials, East West Press.

5.Beer P F and Johston (Jr) E R, Mechanics of Materials: SI Version, McGraw Hill.

6.Shames, I. H., Pitarresi, J. M., Introduction to Solid Mechanics, Prentice-Hall.

****

Fluid Mechanics Lab

Course Code	PC ME-408
Course Title	Fluid Mechanics Lab
Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	Fluid Mechanics – I & II
Course Category	Program Core (PC)
Number of classes	20 hours

Course Outcome:

After completing this course, the students will be able to

CO Number	CO Description	K-level
CO-1	Explain the collected data for Venturimeter.	K2
CO-2	Calculate the collected data with the small orifice/mouthpiece and Orifice meter.	K3
CO-3	Find out various losses during flow through pipes.	K3
CO-4	Analyze the data related to the experiment with Bernoulli's apparatus.	K4

Course Content:

List of experiments:*(Minimum 6 experiments to be performed)*

1. Calibration of Venturimeter
2. Calibration of Orificemeter.
3. Calibration of Rotameter.
4. Determining the Coefficient of discharge for small orifice by constant head method.
5. Determining the Coefficient of discharge for mouthpiece by constant head method.
6. Calibration of contracted Rectangular Notch.
7. Calibration of Triangular Notch.
8. Determination of friction factor of a pipe.
9. Determination of Coefficient for minor losses.
10. Verification of Bernoulli's equation.

References / Suggested Learning Resources:

1. Desmukh, T S, Fluid Mechanics and Hydraulic Machines A Lab Manual.
2. Lab manuals available in the laboratory.

****

Manufacturing Lab

Course Code	PC ME 409
Course Title	Manufacturing Lab

Number of Credits	1 (L: 0, T: 0, P: 2)
Prerequisites	Manufacturing Process
Course Category	Program Core 9 (PC)
Number of classes	24 hours

Course Outcome:

After completion of the course, students will be ableto :

	CO Description	K-level
CO1	To know Metal Forming operation with various equipments	K3
CO2	To perform Hydroforming operation.	K4
CO3	To perform Ring compression test	K4
CO4	To study Forging defects.	K4

List of Experiments *(Minimum 6 experiments to be performed)*

Sl. No.	**Practical Exercises**
1.	Familiarization with Metal Forming operation and Equipments
2.	To perform upsetting operation.
3.	To perform Extrusion operation
4.	To perform Multi step forging operation.
5.	To perform Hammer Forging operation
6.	To perform Rolling operation.
7.	To perform Sheet metal working operation.
8.	To perform Orbital Forming operation.
9.	To perform Hydroforming operation.
10.	To perform Stretch forming operation
11.	To perform Cogging operation
12.	To perform Swaging operation.
13.	To perform Stamping operation.
14.	To perform Quenching operation.
15.	To perform Riveting operation.
16.	To perform Ring compression test
17.	To study Forging defects.

References/ Suggested Learning Resources:-

1. http://msvs-dei.vlabs.ac.in/msvs-dei/Metal_Forming.php
2. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of WorkshopTechnology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
3. Kalpakjian S. and Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition, Pearson Education India Edition, 2002.
4. Gowri P. Hariharan and A. Suresh Babu, "Manufacturing Technology – I" Pearson Education, 2008.
5. Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India,1998.
6. Rao P.N., "Manufacturing Technology"

Essence of Indian Knowledge Tradition

Course Code	MC-410

Course Title	Essence of Indian Knowledge Tradition
Number of Credits	0 (L: 2, T: 0, P: 0)
Prerequisites	Nil
Course Category	Mandatory Course (MC)
Number of classes	26 hours

Course Outcome:

After completion of the course, students will be able to:

CO Number	CO Description	K-level
CO-1	Outline Vedic literature, Puranic Literature and other ancient knowledge tradition of India.	K-2
CO-2	Explain about scientific heritage of ancient India along with comprehending its relevance and application in various modern scientific disciplines.	K-2
CO-3	Demonstrate Indian Philosophical systems with a conscious emphasis on their relevance and application in modern scientific enquiry.	K-2
CO-4	Illustrate Indian Linguistic tradition along with its branches.	K-2
CO-5	Critically analyse the worth of Indian intellectual heritage, traditional practices and Indian lifestyle from scientific lenses.	K-4

Course Content:

Module 1: Introduction to Vedic Literature, Dharmaśāstra and Purāṇas (08 hrs)

- General structure of Vedic Literature,
- Different theories on the age of the Vedas,
- Educational system in the Vedic times
- Subject-matter of Ṛgveda-samhitā, *Sāmaveda -Saṁhitā, Yajurveda-Saṁhitā, Atharvaveda-Saṁhitā, Brāhmaṇa* and *Āraṇyaka* literature, Upaveda
- Vedāṅga Literature
- History of Dharmaśāstra
- Basic concepts of *Purāna*s

Module 2: Indian Knowledge System, Yoga and Health care (06 hrs)

- Origin and Development of Indian Knowledge System
- Concept of Dharma in Indian knowledge tradition
- General ideas about Yoga,
- Origin and Development of Pātañjala Yoga
- Origin and Development of Āyurveda and its relevance

Module 3: Introduction to Indian Philosophy (06 hrs)

- General introduction to Indian Philosophical systems, i.e. Orthodox and Heterodox
- Concept of *Puruṣārtha*s in Indian Philosophy
- General introduction of Upaniṣadic literature
- Indian Philosophy and Modern Science

- Principles in different philosophical systems
- Relevance of Indian Philosophy in Modern time

Module 4: Indian Linguistic and Artistic Tradition (06 hrs)

- Origin and Definition of Language
- Branches and aspects of Science of language
- Vedic and Classical Sanskrit
- Indo-European family of Language
- Role of Sanskrit in comparative Philology
- Sanskrit Phonology and Phonetic laws
- History of Sanskrit Grammar
- Introduction to Śikṣā literature
- Origin and Development of Artistic tradition

References / Suggested Learning Resources:

1) Capra, Fritjof. *The Tao of Phisics*. New York: Harpercollins, 2007.
2) Capra, Fritjof. *The Web of Life*. London: Harpar Collins Publishers, 1996.
3) Chaitanya, Krishna. *Arts of India*, Abhinav Publications, 1987.
4) Chatterjee, S.C & Datta, D.M. *An Introduction to Indian Philosophy*, Calcutta: University of Calcutta, 1984.
5) Cowell, E.B and Gough. A.E (Ed.), *Sarvadarśanasaṅgraha*. Sadguru Publications, 2008.
6) Dasgupta, Surendranath & De, Sushil Kumar. *A History of Sanskrit Literature.*Delhi: Motilal Banarsidass, 2017.
7) Dasgupta, Surendranath. *A History of Indian Philosophy*. Delhi: Motilal Banarsidass, 1991.
8) GN Jha (Eng. Trans.), Ed. RN Jha, *Yoga-darshanam with Vyasa Bhashya*, Vidyanidhi Prakashan, Delhi 2016.
9) Gonda, Jan. *A History of Vedic Literature*. Delhi: Monohar Publishers and Distributors, 2020.
10) Jha, R.N. *Science and Consciousness Psychotherapy and Yoga Practices*. Delhi: Vidyanidhi Prakashan, 2016.
11) Jha, V.N. Language, *Thought and Reality*.
12) Kane. P.V. *History of Dharmasastra*, Poona: Bhandarkar Oriental Research Institute, 1930.
13) Knowledge traditions and practices of India, CBSE Publications.
14) Max Muller. *Ancient Sanskrit Literature*, London: Spottiswoode and Co., 1859.
15) Nagaswamy, R. *Foundations of Indian Art*, Tamil Arts Academy, 2002.
16) Pride of India,New Delhi: Samskrita Bharati, 2006.
17) Shastri, Gourinath. *A History of Vedic Literature*, Kolkata: Sanskrit Pustak Bhandar, 2006.
18) Sinha, Jadunath. *Indian Philosophy*. Delhi: Motilal Banarsidass,1938.
19) Subrahmanialyer,K.S. *Vakyapadia of Bhrarthrihari*. Pune: Deccan College, 1965.
20) V. Sivaramakrishnan (Ed.), *Cultural Heritage of India-course material*. Mumbai: Bharatiya Vidya Bhavan, 5th Edition, 2014.
21) Wujastiyk, Dominik. *The Roots of Ayurveda*. India: Penguin India, 2000.

****
****