PEOPLE'S UNIVERSITY, BHOPAL

(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External (Nil)	Internal (Nil)	Total
BT-1501	Entrepreneurship & IPR	3	1	-			Min 40 (D Grade)			Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. It gives the knowledge entrepreneurship, role of entrepreneur in different field Forms of business organizations/ownership - formation of a company etc.
	2. To give the knowledge of working of management, its qualities, Motivation Theories - motivation model, SWOT analysis and TA analysis to the students.
	3. Marketing, its different types, its impact, its importance, Finance, Break Even Point, Role of state and central government agencies in promotion of small scale industry.

Unit	Contents (Theory)	Marks Weightage
I	**Entrepreneurship:** Definition and functions of an entrepreneur, Qualities of a good entrepreneur Role of entrepreneur in economic development, Theories of entrepreneur, Socio, Economic, Cultural and psychological, Entrepreneur traits and behavior, Roles in economic growth, Employment, Social stability, Export promotion and indigenization, Creating a venture, Opportunity analysis competitive and technical factors, Sources of fund. Forms of business organizations/ownership - formation of a company, Procedures and formalities for setting up of new industry-sources of information to contact for what and where.	**14**
II	**Management:** Importance, Definition and functions, Dimensions of organizations, Size/specialization, Behavior formalization, Authority centralization, Departmentalization, Spam and line of control, Technology and minzberg Organization typology, line, Staff & matrix organization. **Motivation Theories**: Maslow, Mc Cullen - motivation model - need, Want, Motive and behavior – attitude towards work, Self assessment and goal setting , Achievement, Motivation and behavior measurement, SWOT analysis and TA analysis, Stress and conflict management with uncertainty, Creativity and innovation.	**14**
III	**Marketing:** Importance, Definition, Core concepts of need want and demand, Project identification and formulation, Sources of information, Opportunity guidance, Choice of technology and its evaluation, Consumer behavior, Market survey and research, Preliminary project report, Detailed project report, Assessing viability and feasibility of a report, Exchange &relationships, Product value, Cost and satisfaction (goods and services) marketing environment, Selling, marketing and societal marketing concepts, Four p's, product, Price, Placement, Promotion. **Finance:** Nature and scope, Forms of business ownerships, Balance sheet, Profit and loss account, fund flow and cash flow statements, Break Even Point (BEP) and financial ratio analysis, pay-back period, NPV and capital budgeting. Subsidies and concessions for SSI - role of state and central government agencies in promotion of small scale industry.	**14**

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IV	**Concept of Property:** Theories of property, types of intellectual property- origin and development, theories of intellectual property rights, need for protecting intellectual property, commercialization of intellectual property rights by licensing, determining financial value of intellectual property rights, negotiating payments terms in intellectual property transaction.	**14**
V	Introduction to Patent Law, (a) Paris convention , (b) Patent cooperation treaty, (c) Wto-trips , Indian patent law, the patents act, 1970, patentable subject matter, patentability criteria, procedure for filing patent applications, patent granting procedure, revocation, patent infringement and remedies, relevant provisions of the biological diversity act, 2002, access and benefit sharing issues.	**14**

Text Book/References Books/ Websites:

1 Handbook for New Entrepreneurs, EDII, Ahmadabad.
2 P.Saravanavel; Entrepreneurial Development; S. S. Khanka.
3 Tandon B.C.;Environment and Entrepreneur ; Asian Publishers, New Delhi.
4 Singh P.Narendra; Emerging Trends in Entrepreneurship Development Theories & Practices Entrepreneurship
5 Rao Gangadhara N; Growth of Enterprise in Industrial Estates ; N. Gangadhara Rao. Deep & Deep Publications.

Suggested List of Laboratory Experiments: - Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External	Internal	Total 100	External	Internal	Total
CET-1502	Transportation Engineering-II	3	1	-	(70)	(30)	Min 40 (D Grade)	(Nil)	(Nil)	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. To tell about highway planning, alignment & geometric design: principles of highway planning to the students.
	2. It gives knowledge about design of bituminous & cement concrete pavements WBM, WMM, BM, IBM, surfaces.
	3. It explain about low cost roads, drainage of roads, traffic engg. & transportation planning, surface and sub-surface drainage, highway materials to the students.

Unit	Contents (Theory)	Marks Weightage
I	**Highway Planning, Alignment & Geometric Design:** Principles of highway planning, Road planning in India and financing of roads, Classification patterns. Requirements, Engg. Survey required for highway location, Cross sectional elements- width, Camber, Super-elevation, Sight distances, Extra Widening at curves, Horizontal and vertical curves, and Numerical problems.	**14**
II	**Bituminous & Cement Concrete Pavements**: Design of flexible pavements, Design of Mixes and stability, WBM, WMM, BM, surface dressing, Interfacial treatment- seal coat, Tack coat, Prime coat, Wearing coats, Grouted macadam, Bituminous concrete specification, Construction and maintenance. Advantages and disadvantages of rigid pavements, general principles of design, Types, Construction, Maintenance and joints, Dowel bars, Tie bars.	**14**
III	**Low Cost Roads, Drainage of Roads, Traffic Engg. & Transportation Planning:** Principles of stabilization, mechanical stabilization, Requirements, Advantages, disadvantages and uses, Quality control, Macadam roads-types, Specifications, Construction, Maintenance and causes of failures. **Surface and sub-surface drainage, highway materials:** Properties and testing etc. Channelized and Unchannelized intersections, At grade & grade separated intersections, description, Rotary-design elements, Advantages and Disadvantages, Marking, Signs and Signals, Street lighting. Principles of planning, Inventories, Trip generation, Trip distribution, Model split, Traffic assignment, Plan preparation.	**14**
IV	**Airport Planning, Runway & Taxiway:** Airport site selection, Air craft characteristic and their effects on runway alignments, Wind rose diagrams, Basic runway length and corrections, Classification of airports. **Geometrical Elements: T**axi ways and runways, Pattern of runway capacity.	**14**

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V	**Airport, Obstructions, Lightning & Traffic Control**: Zoning regulations, Approach Area, approach surface-imaginary, Conical, horizontal, Rotating beacon, boundary lights, Approach lights, Runway and taxiway lighting etc. Instrumental lending system, Precision approach radar, or Enroute traffic control.	**14**

Text Book/References Books/ Websites:

1. S.K. Khanna & C.E.G. Justo, Highway Engineering, Nam Chand & Bros.
2. Gurucharan singh , Highway Engineering Charotar publications.
3. S.K. Khanna & M. G. Arora Airport Planning & Design , Nam Chand & Bros.
4. Sharma & Sharma, Principles and Practice of Highway Engineering. Asia Publishing House.
5. Relevant IRC & IS Codes.

Suggested List of Laboratory Experiments: - Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1503	Design of R.C.C. Structures-I	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab work & Sessional - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. It gives knowledge of basic principles of structural design, calculation of various loads for structural design
	2. Detail design of beams for different shear and bond.
	3. Design of different types of slabs, on way & two way.

Unit	Contents (Theory)	Marks Weightage
I	**Basic Principles of Structural Design :** Assumptions, Mechanism of load transfer, Various properties of concrete and reinforcing steel, Introduction to working stress method and limit state methods of design, Partial safety factor for load and material, Calculation of various loads for structural design of singly reinforced beam, Partial load factors.	**14**
II	**Design of Beams:** Doubly reinforced rectangular & flanged beams, Lintel, Cantilever, Simply supported and continuous beams, Beams with compression reinforcement, Design of beam for shear and bond.	**14**
III	**Design of Slabs:** Slabs spanning in one direction, Cantilever, Simply supported and continuous slabs, Slabs spanning in two directions, Circular slabs, Waffle slabs, Flat slabs.	**14**
IV	**Columns & Footings:** Effective length of columns, Short and long columns- square, Rectangular and circular columns, Isolated and combined footings, Strap footing, Columns subjected to axial loads and bending moments (sections with no tension), Raft foundation.	**14**
V	**Staircases:** Staircases with waist slab having equal and unequal flights with different support conditions, Slab less tread-riser staircase.	**14**

Text Book/References Books/ Websites:

1 Jain & Jay Krishna; Plain & Reinforced Concrete Vol. I & II , O.P. Publication.
2 Purushothman;Design of Reinforced Concrete Elements; Tata Mcgraw Hill, New Delhi.
3 Rammuttham; Plain & Reinforced Concrete; Medtech.
4 B.C. Punnia; Plain & Reinforced Concrete; Firewall Media.
5 N.K.Raju ; Structural Design & Drawing; CBS Publisher.

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Suggested List of Laboratory Experiments:-

1 Design and drawing of rectangular and flanged beam.
2 Design and drawing of cantilever beam.
3 Design and drawing of one way slab.
4 Design and drawing of two way slab.
5 Design and drawing of square columns.
6 Design and drawing of rectangular and circular column.
7 Design and drawing of rectangular and combined footing.
8 Design and drawing of isolated and strap footing.
9 Design and drawing of staircase.

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Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total 100			Total (50)
CET-1504	Surveying-II	3	1	1	External (70)	Internal (30)	Min 40 (D Grade)	External (35)	Internal (15)	20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks:05

Pre-Requisite	**Nil**
Course Outcome	1. Different types of modern equipments for surveying its application and their uses in the field.
	2. The detail knowledge of astronomy & its use in the surveying.
	3. GPS, its detail working and application in surveying.

Unit	Contents (Theory)	Marks Weightage
I	**Modern Equipments for Surveying :** Digital levels and Theodolite, Electronic distance measurement(EDM) , Total station and global positioning systems (GPS), Digital planimeter	**14**
II	**Surveying Astronomy:** Introduction and purpose of astronomy, Determination of latitude and longitude azimuth, Definitions of astronomical terms, Coordinate systems for locating heavenly bodies, Geographic, Geodetic, Geocentric, Cartesian, local and projected coordinates for earth resources mapping, Convergence of meridian, Parallel of latitude, Shortest distance between two points on the earth, Determination of latitude and longitude.	**14**
III	**GPS Surveying:** Introduction & components of GPS, Space segment, Control segment and user segment, Elements of satellite based surveys-map datum's, GPS receivers, GPS observation methods and their advantages over conventional methods, Digital terrain model (DTM), Topographic representation of the terrain and generation of DTM on computers using spot heights and contour maps.	**14**
IV	**Photogrammetry :**Principle, Definitions and classifications of terrestrial and aerial photogrammetry, Flight planning for aerial photography, Scale and relief displacements of vertical aerial photographs, Stereoscopic vision on vertical photographs, Computation of position, Length and elevations of objects using photographs and photo mosaic.	**14**
V	**Remote Sensing:** Principle, Components, Classification, Remote sensing data acquisition process, Different types of remote sensing satellite imagery with special relevance to Indian Remote Sensing Satellites (IRSS) and applications, Geographic Information Systems (GIS), Definition, Components and advantages.	**14**

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Programme: **Bachelor of Technology** **Semester –V**

Text Book/References Books/ Websites:

1 T.P. Kanetkar and S.V. Kulkarini; Surveying and Leveling-Part-I & II ; Pune Vidyarthi Griha Prakashan, Pune.

2 A.M. Chandra; Surveying: Problems Solving with Theory and Objective type Questions; New Age International Publishers N. Delhi.

3 A.M. Chandra ; Advance Surveying; New Age International Publishers N. Delhi.

4 S.K. Duggal, Surveying Vol. II; Tata Mcgraw ; Hill Publishing Company Ltd. New Delhi.

Suggested List of Laboratory Experiments:-

1	To find the R.L. of given stations with the help of Auto Level.
2	Study of electronic total station and to find the horizontal distance and vertical height with the help of Total Station.
3	To set out a transition curve in the field.
4	To set out the simple curve by two theodolite method.
5	To set out the simple curve by single theodolite method.
6	To measure included angle by theodolite traversing.
7	To measure the exterior angle by theodolite traversing.
8	Determination of elevation of point trigonometric leveling.
9	To make a contour plan of given area (on full size drawing sheet).
10	Determination of horizontal distance between two inaccessible points with Theodolite.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total 100	External (35)	Internal (15)	Total (50)
CET-1505	Fluid Mechanics-II	3	1	1			Min 40 (D Grade)			20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test - Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1. It gives the knowledge of different types of flows and its related problems, pipe network, water hammer. transmission of power.
	2. To study uniform flow in open channels, specific energy, critical flow.
	3. To give the knowledge of different types of forces on immersed bodies such as sphere, cylinder, flat plate

Unit	Contents (Theory)	Marks Weightage
I	**Turbulent Flow:** Laminar and turbulent boundary layers and laminar sub layer, Hydrodynamic ally smooth and rough boundaries, Velocity distribution in turbulent flow, Resistance of smooth and artificially roughened pipes, Commercial pipes, Aging of pipes. **Pipe Flow Problems:** Losses due to sudden expansion and contraction, Losses in pipe fittings and valves, Concepts of equivalent length, Hydraulic and energy gradient lines, Siphon, pipes in series, Pipes in parallel, Branching of pipes. **Pipe Network:** Water hammer, Transmission of power, Hardy cross method	**14**
II	**Uniform Flow in Open Channels :** Channel geometry and elements of channel section, Velocity distribution, Energy in open channel flow, Specific energy, Types of flow, Critical flow and its Computations, Uniform flow and its computations, Chezy's and manning's formulae, Determination of normal depth and velocity, Normal and critical slopes, Economical sections.	**14**
III	**Non uniform flow in Open Channels :** Basic assumptions and dynamic equations of gradually varied flow, Characteristics analysis and computations of flow profiles, Rapidly varied flow hydraulic jump in rectangular channels and its basic characteristics, Surges in open channels & channel flow routing, Venturi flume.	**14**
IV	**Forces on Immersed Bodies:** Types of drag, Drag on a sphere, A flat plate, A cylinder and an aerofoil development of lift, Lifting vanes, Magnus effect.	**14**
V	**Turbines:** Classifications, Definitions, Similarity laws, Specific speed and unit quantities, Pelton turbine-their construction and settings, Speed regulation, Dimensions of various elements, Action of jet, Torque, Power and efficiency for ideal case, Characteristic curves, Reaction turbines, Construction & settings, Draft tube theory, Runaway speed, simple theory of design and characteristic curves, Cavitations. **Pumps: Centrifugal Pumps :** Various types and their important components, Manometric head, Total head, Net positive suction head, Specific speed, Shut off head, Energy losses, Cavitations, Principle of working and characteristic curves. **Reciprocating Pumps**: Principle of working, Coefficient of discharge, Slip, Single acting and double acting pump, Manometric head, Acceleration head.	**14**

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Programme: **Bachelor of Technology** **Semester –V**

Text Book/References Books/ Websites:

1. Modi & Seth ; Fluid Mechanics; Standard Book House, Delhi.
2. Rangaraju; Open Channel Flow; Tata Mc Graw - Hill Publishing Comp. Ltd., New Delhi.
3. A.K. Jain; Fluid Mechanics; Khanna Publishers, Delhi.
4. K.R. Arora; Fluid Mechanics, Hydraulics & Hydraulic Machanics ; Standard Publishers Distributors 1705- B, Nai Sarak, Delhi-6.
5. R K Bansal; Fluid Mechanics; Laxmi publication.

Suggested List of Laboratory Experiments:-

1. Study the performances characteristics of Pelton wheel turbine.
2. Study the performances characteristics of Francis turbine.
3. Study the performances characteristics of Kaplan turbine.
4. Calibration of multistage (two) pumps & study of characteristic of variable speed pump.
5. To study the performance & details of operation of Hydraulic Ram.
6. Determination of minor losses in pipe flow.
7. Study of the characteristic of the Reciprocating Pump.
8. Determination of chezy's and manning's constant.
9. Determination of pipe friction factor.

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Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total Nil			Total (50)
CET-1506	Highway Material Testing Lab	-	-	1	External (Nil)	Internal (Nil)	Nil	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil
Practical Internal Max Marks: 15	Lab work & Sessional - Max Marks: 10	Assignment/Quiz/Attendance - Max. Marks: 05

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:-

1. Aggregate Crushing Value Test.
2. Determination of Aggregate Impact Value.
3. Determination of Los Angeles Abrasion Value.
4. Determination of California Bearing Ratio values
5. Determination of Penetration value of bitumen
6. Determination of Viscosity of bituminous material.
7. Determination of Softening Point of bituminous material.
8. Determination of Flash point and Fire point of bituminous material.
9. Determination of bitumen content by Centrifuge Extractor.
10. Determination of Stripping Value of road aggregate.

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Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total Nil			Total 100
CET-1507	Industrial Training-I	-	-	2	External (Nil)	Internal (Nil)	Nil	External (70)	Internal (30	Min: 40 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test - Max Marks: Nil	Assignment/Quiz/Attendance - Max. Marks: Nil
Practical Internal Max Marks: 30	Lab work & Sessional - Max Marks: 25	Assignment/Quiz/Attendance - Max. Marks: 05

Pre-Requisite	Nil
Course Outcome	1. It gives the knowledge and importance of industrial training for the engineering students. Its requirement after completion of our studies.
	2. It gives the knowledge and importance of Training and Placement Officer (TPO)
	3. It gives the knowledge of how to present a seminar on their training and will face viva-voce on training in the institute

Unit	Contents (Theory)	Marks Weightage
I	The objective of undertaking industrial training is to provide work experience so that student's engineering knowledge is enhanced and employment prospects are improved, Industrial training of the students is essential to bridge the wide gap between the classroom and industrial environment. As a part of B. Tech. curriculum, CET-507, Industrial Training -I is a Practical course, which the students should undergo in reputed Private / Public Sector / Government organization / companies as industrial training of minimum two weeks to be undergone by the student in the semester break after IV semester theory examinations. **Training period**: Minimum of two weeks or 15 (Fifteen) Days. **Evaluation:** Fifth semester **Companies / Areas covered**: Any field related to concern branch / discipline of Engineering. **Grading**: As per Scheme. **Note:** Presentation will take place the following week after completion your training. The presentation is evaluated by your class in charge. Report must be submitted during power point presentation. A Viva voce comprising comprehensive questions based on your presentation and training undergone. **Etiquettes:** Dress properly, Behave well, Portray good image as a university student, Be punctual, Observe work ethics, Concern for safety, Be professional.	**100**

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments:- Nil

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Programme: **Bachelor of Technology** **Semester –V**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (50)			Total
BT-1508	Indian Constitution	2	-	-	External (35)	Internal (15)	Min: 20 (D Grade)	External (Nil)	Internal (Nil)	Nil

Duration of Theory (Externals): 2 Hours

Theory Internal- Max Marks: 15	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/Attendance Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1. Understand the functions of the Indian government.
	2. Understand and abide the rules of the Indian constitution.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction:** Constitution meaning of the term, Indian constitution, Sources and constitutional history, Features, Citizenship, Preamble, Fundamental rights and duties, Directive principles of state policy.	**07**
II	**Union Government and Its Administration:** Structure of the Indian Union, Federalism, Centre- State relationship, President role, Power and position, PM and council of ministers, Cabinet and central secretariat, Lok sabha, Rajya sabha.	**07**
III	**State Government and its Administration:** Governor, Role and position, CM and council of ministers, State secretariat, Organization, Structure and functions.	**07**
IV	**Local Administration:** District's administration head, Role and Importance, Municipalities, Introduction, Mayor and role of elected representative, CEO of municipal corporation, panchayati raj, Introduction, PRI: Zila Panchayat, Elected officials and their roles, CEO Zila Panchayat, Position and role, Block level, Organizational Hierarchy (Different departments), Village level, Role of Elected and Appointed officials, Importance of grass root democracy.	**07**
V	**Election Commission:** Role and functioning, Chief Election Commissioner and Election Commissioners, State Election Commission, Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC and women.	**07**

 # Mandatory (Non Credit) subject according to AICTE. Non University Examination; End Sem marks not to be included in total marks and credit. Students must pass in this subject.

Text Book/References Books/ Websites:

1. Laxmikanth ;Indian Polity; McGraw Hill Education.
2. Subhash Kashyap ;Indian Administration; National Book Trust.
3. D.D. Basu; Indian Constitution; Lexis Nexis; Twenty-Third 2018 edition.
4. Avasti and Avasti ; Indian Administration; Lakshmi Narain Agarwal Educational Publishers.

Suggested List of Laboratory Experiments:-Nil