Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat) Scheme of Studies & Examinations under Choice Based Credit System

Programme: B. Tech. in Aeronautical Engineering; Year - 2nd (Semester – IV); Session: 2019-20

S. No.	Course Code	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	AER 202 C	Aircraft Material & Processes	3	1	0	25	75	-	100	4	3
2	AER 204 C	Aircraft Performance,	3	1	0	25	75	-	100	4	3
3	AER 206 C	Aircraft System & Instrumentation	3	1	0	25	75	-	100	4	3
4	AER 208 C	Aircraft Propulsion	3	0	0	25	75		100	3	3
5	AER 210 C	Aircraft structure	3	0	0	25	75	-	100	3	3
6	AER 212 C	Aircraft Propulsion lab	0	0	2	25	-	75	100	1	3
7	AER 214C	Aircraft Structure Lab	0	0	2	25	-	75	100	1	3
8	MC 201C / MC 203C	Environmental Studies (Group A) / Constitution of India (Group B)	3	0	0	25	75	-	100	0	3
Total			18	3	4	200	450	150	800	20	

1. At the end of 4th Semester,the students have to undergo Professional Training (level-2) of atleast 4-weeks from Industry/Institute/Research Lab/Training Centre during summer vacation and its evaluation shall be carried out in the 5th semester.
2. For student admitted in B. Tech. 1st Semester (C-Scheme) in 2019 and all trailing students, Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.

Department: Aeronautical Engineering
Subject: Aircraft Material & Processes
Subject Code: AER 202 C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

UNIT – I

Elements and Properties of Aerospace Materials:
TOPIC NO 1 Structure of solid materials,
TOPIC NO 2 atomic structure of materials,
TOPIC NO 3 crystal structure, miller indices,
TOPIC NO 4 density, packing factor, space lattices,
TOPIC NO 5 X-ray diffraction, imperfection in crystals
TOPIC NO 6 physical metallurgy,
TOPIC NO 7 general requirements of materials for aerospace applications,
TOPIC NO 8 factors affecting choice of material for different parts of the airplane.
Linear and nonlinear elastic properties:
TOPIC NO 9 Yielding, strain hardening, fracture,
TOPIC NO 10 Bauchinger's effect,
TOPIC NO 11notch effect testing and flaw detection of materials and components,
TOPIC NO 12 creep and fatigue.

UNIT – II

Corrosion & Heat Treatment of Metals and Alloys:
TOPIC NO 13 Types of corrosion,
TOPIC NO 14 effect of corrosion on mechanical properties,
TOPIC NO 15 stress corrosion cracking,
TOPIC NO 16 corrosion resistant materials used for space vehicles,
TOPIC NO 17 heat treatment of carbon steels,
TOPIC NO 18 aluminium alloys, magnesium alloys and titanium alloys,
TOPIC NO 19 effect of alloying treatment, heat resistant alloys,
TOPIC NO 20 tool and die steels, magnetic alloys.

UNIT – III

Ceramics and Composites:
TOPIC NO 21 Introduction, profiling, hydroforming, marforming,
TOPIC NO 22 bending rolls, sparmilling and powdered metallurgy,
TOPIC NO 23 modern ceramic materials,
TOPIC NO 24 cermets, cutting tools, glass ceramic,
TOPIC NO 25 production of semi fabricated forms,
TOPIC NO 26 plastics and rubber,
TOPIC NO 27 carbon/carbon composites,
TOPIC NO 28 fabrication processes involved in metal matrix composites,
TOPIC NO 29 shape memory alloys,
TOPIC NO 30 applications in aerospace vehicle design,
TOPIC NO 31 open and close mould processes.

UNIT – IV

High Temperature Materials Characterization:

TOPIC NO 32 Classification, production and characteristics,
TOPIC NO 33 methods and testing,
TOPIC NO 34 determination of mechanical and thermal properties of materials at elevated temperatures,
TOPIC NO 35 application of these materials in thermal protection systems of aerospace vehicles,
TOPIC NO 36 Super alloys, high temperature material characterization,
TOPIC NO 37 comparative study of metals,
TOPIC NO 38 ceramics plastics and composites,
TOPIC NO 39 integral machining, contour etching.
TOPIC NO 40 high energy rate forming, manufacture of honeycomb structures,
TOPIC NO 41 design principles of jig for wing,
TOPIC NO 42 fuselage and other components of aircraft.

TEXT BOOKS:

1. Aircraft Material and Processes, G. F.Titterton, Himalayan Books.
2. Advanced Composite materials, Lalit Gupta, Himalayan Books.
3. Aircraft Production methods, G. B. Ashmead, Chilton Company.

REFERENCE BOOKS:

1. Engineering Materials, Their properties and Applications, Martin, J.W., Wykedham Publications (London) Ltd.
2. Materials Science and Engineering, Raghavan.V., Prentice Hall of India, New Delhi.
3. Materials Science for Engineers, Van Vlack.L.H., Addison Wesley.

Aircraft Performance
Subject Code: AER 204C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

UNIT – I

The Standard Atmosphere and Airflow:
TOPIC NO 1 Standard atmosphere,
TOPIC NO 2 relation between geo-potential and geometric altitudes,
TOPIC NO 3 pressure, temperature and density altitudes.
TOPIC NO 4 relations for isothermal and gradient atmospheric regions,
TOPIC NO 5 stability of atmosphere.
Measurement of air-speed:
TOPIC NO 6 Indicated airspeed,
TOPIC NO 7 calibrated airspeed,
TOPIC NO 8 equivalent airspeed and true airspeed,
TOPIC NO 9 airspeed indicator.
High Lift Devices:
TOPIC NO 10 Maximum lift coefficient of airfoils,
TOPIC NO 11 leading and trailing edge devices,
TOPIC NO 12 the deep stall,
TOPIC NO 13 propulsive lift,
TOPIC NO 14 V/STOL configurations.

UNIT – II

Aerodynamic Drag:
Topic No.15 Drag, causes of drag,
Topic No.16 Types of drag,
Topic No.17 factors affecting drag. drag polar,
Topic No.18 compressibility drag,
Topic No.19 design for minimum drag,
Topic No.20 Estimation of drag of complete airplane for subsonic and supersonic cases,
Aerodynamic Characteristics:
TOPIC NO 21 Force and moment coefficients from dimensional analysis and their variation with angle of attack,
TOPIC NO 22 lift, drag and moment coefficients,
TOPIC NO 23 relations between lift and drag, aerodynamic center,
TOPIC NO 24 center of pressure, pressure distribution over 2-D airfoil,
TOPIC NO 25 estimation of aerodynamic characteristics from measured pressure distribution,
TOPIC NO 26 variation of aerodynamic coefficients with Reynold's number and Mach number,
TOPIC NO 27 Effect of span,
TOPIC NO 28 aspect ratio, plan form, sweep, taper and twist on aerodynamic characteristics of a lifting surface,
TOPIC NO 29 delta wing aerodynamics.

UNIT – III

Aircraft Performance in Steady Flight:
TOPIC NO 30 Straight and level flight,
TOPIC NO 31 variation of drag with flight speed,
TOPIC NO 32 minimum drag conditions, variation of power with flight speed,

TOPIC NO 33 minimum power conditions, gliding flight,
TOPIC NO 34 shallow and steep angles of glide,

TOPIC NO 35 sinking speed, minimum sinking speed,
TOPIC NO 36 time of descent, climbing flight at shallow angles, TOPIC NO 37 correction for steep angles, time to flight,
TOPIC NO 38 maximum rate of climb.

UNIT – IV

Aircraft Performance in Accelerated Flight:

TOPIC NO 39 Take-off and landing, calculation of take-off ground run and take off distances,
TOPIC NO 40 minimum ground run,
TOPIC NO 41 assisted take-off,
TOPIC NO 42 calculation of landing ground run and landing distances,
TOPIC NO 43 I-range and endurance, numerical problems.

Maneuvers & Energy Methods:

TOPIC NO 44 Maneuvering performance,
TOPIC NO 45 introductory comments on spins and stalls,
TOPIC NO 46 analysis of spin, various types of stalling behavior of wings,
TOPIC NO 47 turning flight, maneuvers in 3-D space,
TOPIC NO 48 Karman's method of jato,
TOPIC NO 49 energy method of performance calculations.

TEXT BOOKS:

1. Aircraft Performance and Design, J. D. Anderson Jr., Tata Mc Graw-Hill.
2. Introduction to Flight, J. D. Anderson Jr., Tata Mc Graw-Hill.
3. Aerodynamics for Engineering Students, E.L. Houghton and N.B. Carruthers, Butterworth Heinamann

Subject: Aircraft Systems and Instrumentation
Subject Code: AER 206C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

UNIT – I

Aircraft Systems:
TOPIC NO 1 Hydraulic systems,
TOPIC NO 2 study of typical systems, components,
TOPIC NO 3 hydraulic systems controllers,
TOPIC NO 4 modes of operation, pneumatic systems,
TOPIC NO 5 working principles,
TOPIC NO 6 typical pneumatic power system,
TOPIC NO 7 brake system, components,
TOPIC NO 8 landing gear systems, classification,
TOPIC NO 9 shock absorbers,
TOPIC NO 10 retractive mechanism.

UNIT – II

Airplane Control Systems:

TOPIC NO 11 Conventional systems,
TOPIC NO 12 power assisted and fully powered flight controls,
TOPIC NO 13 power actuated systems,
TOPIC NO 14 engine control systems,
TOPIC NO 15 push pull rod system,
TOPIC NO 16 operating principles, modern control systems,
TOPIC NO 17 digital fly by wire systems, auto pilot system, active control technology.

UNIT – III

Engine Air conditioning and Pressurizing Systems:

TOPIC NO 18 Fuel systems, multi-engine fuel systems,
TOPIC NO 19 lubricating systems, starting and ignition systems,
TOPIC NO 20 basic air cycle systems, oxygen systems,
TOPIC NO 21 fire extinguishing system and smoke detection system,
TOPIC NO 22 deicing and anti-icing system.

UNIT – IV

Aircraft Instruments:
TOPIC NO 23 Flight instruments and navigation instruments,
TOPIC NO 24 accelerometers, air speed indicators,
TOPIC NO 25 mach meters, altimeters, gyroscopic instruments,
TOPIC NO 26 principles and operation,
TOPIC NO 27 study of various types of engine instruments,
TOPIC NO 28 tachometers, temperature and pressure gauges,
Introduction to navigational instruments:
TOPIC NO 29 VOR,
TOPIC NO 30 TACAN,
TOPIC NO 31 VORTAC, etc.

TEXT BOOKS:

1. Aircraft Systems, Mechanical, Electrical and Avionics Subsystems Integration, Ian Moir and Allan Seabridge, IIIrd Edition, Wiley Publishers.
2. Aircraft Instrumentation and Systems, S. Nagabhushana, L. K. Sudha, Ist edition, IK Books.

REFERENCE BOOKS:

1. Aircraft Instruments and Integrated Systems, EHJ Pallet, Prentice Hall.
2. Pallet, E.H.J. Aircraft Instruments & Principles, Pitman & Co.
3. Aircraft Systems, David Lombardo, McGraw Hill.

Subject: Aircraft Propulsion
Subject Code: AER 208C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

UNIT – I

Aircraft Piston Engines:
TOPIC NO 1 The internal combustion engine process,
TOPIC NO 2 brief history, G.I and C.I engines,
TOPIC NO 3 4-stroke and 2-stroke engines,
TOPIC NO 4 air standard cycles,
TOPIC NO 5 various types of arrangements for multi cylinder aircraft engines,
TOPIC NO 6 their merits and operational efficiencies,
TOPIC NO 7 cooling, lubricating and ignition systems, valve timing diagrams,
TOPIC NO 8 I.H.P., B.H.P. and S.H.P.,
TOPIC NO 9 performance, effect of altitude,
TOPIC NO 10 power required and power available,
TOPIC NO 11 supercharging, types of superchargers.

UNIT – II

Aircraft Gas Turbune Engines:
TOPIC NO 12 Air standard Brayton cycle, actual gas turbine engine cycle,
TOPIC NO 13 compressor and turbine efficiencies,
TOPIC NO 14 compressor and turbine work, centrifugal and axial type of compressors,
TOPIC NO 15 Their compressive action, relative merits in operations,
TOPIC NO 16 Combustion chambers, simplex and duplex burners, expansion process,
TOPIC NO 17 turbine materials for different components, engine intake and exhaust nozzles,
TOPIC NO 18 Afterburners, thrust augmentation, turboprop,
TOPIC NO 19 Turbo shaft and turbofan engines, multi shaft gas turbine engines,
TOPIC NO 20 Thrust equation installed and uninstalled thrust.

UNIT – III

Propellers:
TOPIC NO 21 Ideal momentum theory, blade element theory,
TOPIC NO 22 activity factor, airscrew coefficients,
TOPIC NO 23 Numerical problems on the performance of propellers,
TOPIC NO 24 selection of propellers, fixed, variable and constant speed propellers,
TOPIC NO 25 Material for propellers, momentum theory applied to helicopter rotor.

UNIT – IV

Other Propulsion Systems:
TOPIC NO 26 Introduction to other propulsion systems such as ram jet,
TOPIC NO 27 Scram jet, rocket propulsion,
TOPIC NO 28 Pulse detonation engine,
TOPIC NO 29 chemical, electric and hybrid propulsion.

TEXT BOOKS:

1. Mechanics & Thermodynamics of Propulsion, Hill, P.G. & Peterson, C.R., Pearson education.
2. Elements of Gas Turbine Propulsion, J. Mattingly, Tata McGraw Hill.
3. Aircraft Propulsion, S. Farokhi, Wiley-Blackwell, 2nd Edition edition.

REFERENCE BOOKS:

1. Gas Turbine, Jet and Rocket Propulsion, Mathur, M.L. and Sharma, R.P., Standard Publishers & Distributors, Delhi, 2nd edition
2. Heat transfer, B.Gebhart, McGraw Hill
3. Gas Turbine Theory, Cohen, Rogers and Saravanamuttu, Pearson Education
4. Physics of Electric Propulsion, Robert G. Jahn, Dover Publications, 2006.

NOTE:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students.

Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.

Subject: Aircraft Structures
Subject Code: AER 210C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	4	25	75	3 hours	100

UNIT I

Statically Determinate & Indeterminate Structures:
TOPIC NO 1 Plane truss analysis, method of joints,
TOPIC NO 2 method of sections, method of shear,
TOPIC NO 3 3-D trusses,
TOPIC NO 4 principle of super position,
TOPIC NO 5 Clapeyron's 3 moment equation and moment distribution method for indeterminate beams.
Energy Methods:
TOPIC NO 6 Strain energy in axial, bending, torsion and shear loadings.
TOPIC NO 7 Castigliano's theorems and their applications.
TOPIC NO 8 Maxwell betti's reciprocal theorem,
TOPIC NO 9 dummy load & unit load methods,
TOPIC NO 10 energy methods applied to statically determinate and indeterminate structures.

UNIT II

Stresses and Strain:
TOPIC NO 11 Introduction to various types of stresses and strains.
TOPIC NO 12 Bending of symmetric beams subject to skew loads,
TOPIC NO 13 bending stresses in beams of unsymmetrical sections,
TOPIC NO 14 generalized K-method, neutral axis method,
TOPIC NO 15 principal axis method, advantages and disadvantages of three methods

UNIT III

Columns:
TOPIC NO 16 Euler's column curve, inelastic buckling,
TOPIC NO 17 effect of initial curvature, southwell plot,
TOPIC NO 18 columns with eccentricity, use of energy methods,
TOPIC NO 19 theory of beam columns, beam columns with different end conditions,
TOPIC NO 20 stresses in beam columns.
Bending of Thin Plates:
TOPIC NO 21 Local buckling stress of thin walled sections
TOPIC NO 22 crippling strength estimation thin skin stringer panel,
TOPIC NO 23 effective skin width, inter rivet buckling-skin stringer panel,
TOPIC NO 24 Integrally stiffened panels-cutouts, lightly loaded beam

UNIT IV

Loads on Aircraft:
TOPIC NO 25 Pure translation, inertia forces on rotating bodies,
TOPIC NO 26 load factors for translational acceleration,
TOPIC NO 27 load factors for angular acceleration, numerical problems.
Stress Analysis of Wing and Fuselage:
TOPIC NO 28 Aircraft loads- classification – the V-N diagram,
TOPIC NO 29 shear force and bending moment distribution over the aircraft wing and fuselage,

TOPIC NO 30 shear flow in thin-webbed beams with parallel and non-parallel flanges,

TOPIC NO 31 complete tension field beams, semi-tension field beam theory.

TEXT BOOKS:

1. Aircraft Structures for Engineering students, Megson T M G, Butterworth-Heinemann publisher, 5th edition
2. Aircraft structures, D.J.Peery and J.J.Azhar, 2nd Ed., McGraw Hill.
3.

REFERENCE BOOKS:

1. Analysis of Aircraft Structures - An Introduction, 2nd edition , Donaldson, B.K., Cambridge University Press publishers.
2. Airframe structural Design, Michael Chun-Yung Niu, Conmilit Press Ltd.
3. Fundamentals of Aircraft Structural Analysis, Howard D Curtis, WCB-McGraw Hill.
4. Structural stability of Columns and Plates, N G R Iyengar, John Wiley & sons.
5. Mechanics of Materials, 8th edition, James M. Gere & Barry J Goodno, Cengage Learning Custom Publishing

NOTE:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students.

Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.

Subject: AIRCRAFT STRUCTURES LAB
Subject Code: AER 214C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
0	0	2	1	25	75	3 hours	100

S. No.	LIST OF EXPERIMENTS
1	To carry out stress analysis of a truss using software
2	Measurement of deflection of truss using DTI
3	Verification of superposition theorem
4	To prove Maxwell Reciprocal theorem for a Simply Supported/Cantilever beam.
5	Determination of Elastic constants for a Composite Tensile Specimen
6	Determination of Elastic constants for a Composite Flexural Specimen.
7	To measure deflection of Beams for simply supported and cantilever beam.
8	Unsymmetrical Bending of a Cantilever/simply supported beam
9	Stress Analysis of a column with different end conditions.
10	Buckling load estimation of slender eccentric columns
11	Determination of flexural rigidity of composite beams
12	Combined bending and Torsion of a Hollow Circular Tube
13	Determination of compressive strength of thin plates.

Note:

1. At least ten experiments are to be performed in the semester.
2. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or designed & set by the department as per the scope of the syllabus

Subject: AIRCRAFT PROPULSION LAB
Subject Code: AER 212C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
0	0	2	1	25	75	3 hours	100

S. No.	LIST OF EXPERIMENTS
1	Analysis of exhaust gases from single cylinder/multi-cylinder/petrol engine by Orsat apparatus
2	To prepare heat balance sheet on multi-cylinder diesel engine/petrol engine.
3	To prepate variable speed performance test of a multi-cylinder/single cylinder petrol engine/diesel engine and prepare the curve (i) bhp, ihp, fhp Vs speed (ii) Volumetric efficiency & indiacted specific fuel consumption Vs speed.
4	To perform constant speed performance test on a single cylinder /multi cylinder diesel engine and draw curves of (i) bhp vs fuel rate, air rate and a/f ratio (ii) bhp vs mep. mechanical efficiency and sfc.
5	To study and determine the effects of A/F ratio on the performance of the 2-Stroke single cylinder petrol engine.
6	To study and draw the valve timimg diagram four stroke single cylinder diesel engine.
7	To demonstrate the constructional arrangement and operation of turbojet and turbo-fan.
8	To demonstrate the constructional arrangement and operation of turboprop and turboshaft.
9	To determine the velocity and pressure measurement in co-axial jets.
10	To study wall pressure distribution in subsonic diffusers.
11	To study flame stabilization studies using conical flame holders.
12	To analyze the performance characteristics of gas turbine /jet propulsion system.
13	To evaluate propeller performance using propllertest rig.
14	To measure the lift force of a single propeller and to analyze the effects of propeller diameter, pitch and blade number.

Note:

1. At least ten experiments are to be performed in the semester.
2. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or designed & set by the department as per the scope of the syllabus

Subject: Constitution of India

Subject Code: MC203C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

Unit 1 Philosophy of Indian Constitution:
Topic No1 Ideological Basis and Salient Features of Indian Constitution,
Topic No2 Fundamental Rights & Duties of the Citizens**,**
Topic No3 Directive Principles of State Policy

Unit 2 Nature and Dynamics of Indian Federalism:
Topic No4 Federalism: Theory and Practice in India,
Topic No5 Federal Features of the Indian Constitution**,**Legislative,
Topic No 6 Administrative and Financial Relations between the Union and the States.

Unit 3 Union and State Legislature :
Topic No7 Parliament: Composition, Functions and Working of the Parliamentary system
Topic No8 State Legislature:
Topic No9 Composition and Functions of Vidhan Sabha/ Vidhan Parishad

Unit 4 Centre and State: Executive and Judiciary:
Topic No10 President,
Topic No11 Prime Minister and Council of Ministers **,**
Topic No12 Governor,
Topic No13 Chief Minister and Council of Ministers**,**Judiciary:
Topic No14 Supreme Court;
Topic No15 High Court

Text Books:

1. Austin G., The Indian Constitution: Corner Stone of a Nation, New Delhi: Oxford University Press, 196
2. Basu D.D., An Introduction to the Constitution of India, New Delhi: Prentice Hall, 1994
3. Kothari R., Politics in India, New Delhi: Orient Language, 1970
4. Siwach J.R., Dynamics of Indian Government and Politics, New Delhi: Sterling Publishers, 1985
5. Bhambhri C.P., The Indian State--Fifty Years, New Delhi: Shipra, 1997
6. Ghai U.R., Indian Political System, Jalandhar: New Academic Publishing Company, 2010

Course Outcomes: Upon successful completion of this course,students will be able:

1. To understand basic features of the constitution and rights and duties of Indian citizens
2. To understand the basic structure of Centre and State Government
3. To get acquainted with the nature of parliamentary form of Government
4. To have knowledge of the executive and judiciary powers in Indian democratic set-up

Scheme of End Semester Examinations (Major Test):

1. The duration of examinations will be three hours.
2. Nine questions of 15 marks each will be set out of which the students will have to attempt five questions in all.
3. First question of 15 marks will be compulsory. It will cover all the four units of the syllabus. The nature of the questions in each unit will depend upon the nature of content therein. The questions may have sub-parts with marks assigned against each.
4. Question No 02 to 09 of 15 marks each will be set from the four units of the syllabus --- two from each unit.
5. In addition to first compulsory question the students will have to attempt four more questions, selecting one from each unit.

Subject: Environmental Studies

Subject Code: MC201C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

UNIT – I Environmental Studies and Environmental Pollution

Topic No1 The Multidisciplinary Nature of Environmental Studies,
Topic No2 Introduction to Environment:
Topic No3 Definition, Scope, and importance of environmental studies;
Topic No4 need for public awareness.
Topic No5 Environmental Pollution: Definition, Cause and effects
Topic No6 Air pollution,
Topic No7 Water pollution,
Topic No8 Soil pollution,
Topic No 9 Marine pollution,
Topic No10 Noise pollution,
Topic No11 Role of an individual in prevention of pollution,
Topic No12 Pollution case studies

UNIT – II Natural Resources:

Topic No13 Water resources: over-utilization, floods, drought, dams-benefits and problems;
Topic No14 Mineral resources: Use and exploitation, environmental effects;
Topic No15 Food resources: changes caused by modern agriculture, fertilizer-pesticide problems, water logging,
Topic No16 Energy resources: Growing energy needs, renewable and non renewable energy sources;
Topic No17 Land resources: Land as a resource, land degradation, man induced landslides,
Topic No18 soil erosion and desertification.

UNIT – III Ecosystems and Biodiversity

No19 Concept of an ecosystem,
Topic No20 Structure and function,
Topic No21 Energy flow,
Topic No22 Ecological succession,
Topic No23 ecological pyramids.
Topic No24 Concept of Biodiversity, definition and types,
Topic No25 Hot-spots of biodiversity; threats to biodiversity,
Topic No26 Endangered and endemic species of India, Conservation of biodiversity.

UNIT - IV Social Issues and Environment

Topic No27 Water conservation,
Topic No28 rain water harvesting,
Topic No29 Environmental ethics: Issues and possible solutions.
Topic No30 Climate change, global warming,
Topic No31 acid rain,
Topic No32 ozone layer depletion,
Topic No33 Public awareness.
Topic No34 Population growth, variation among nations,

Topic No35 Family Welfare Programme.
Topic No36 Human Population and the Environment
Topic No37 Population growth,

Topic No38 Population explosion,
Topic No39 Women and Child Welfare.

Field Work –

1. Visit to a local area to document environmental assets—river/forest/grassland/hill/ mountain.
2. Visit to a local polluted site—Urban/Rural/Industrial/Agricultural.
3. Study of common plants, insects, birds.
4. Study of simple ecosystems—pond, river, hill slopes, etc

REFERNCE BOOKS:

1. A Textbook of Environmental Studies by Asthana D.K. and Asthana Meera
2. Fundamental Concepts in Environmental Studies by Mishra D.D.
3. Environmental Studies by S.C Sharma M.P Poonia
4. Textbook of Environmental Studies for Undergraduate by Erach Bharucha
5. Environmental Studies: Third Edition by R. Rajagopalan

PURAN
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CAMPUS