PROGRAM SPECIFIC OUTCOMES (PSO): M.Tech(Manufacturing & Automation)

At the end of the programme, the student will have

PSO1 an ability to apply knowledge and skill of various approaches in manufacturing technology and automation, for solving complex engineering problems.

PSO2 use research based knowledge and research methods including design of experiments, analysis and interpretation of data and IT tools.

PSO3 an ability to automate a mechanical system or a process to meet desired needs within realistic constraints such as health, safety and manufacturability.

PSO4 understanding about the concept of Quality in manufacturing

PSO5 Should be able to handle research problems and write dissertations.

M.D.UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION
M.TECH 1st YEAR (MANUFACTURING & AUTOMATION)
SEMESTER 1
CBCS Scheme effective from 2016-17

Sl. No	Course Code	Subject	Credit Pattern				Examination Schedule (Marks)				Duration of Exam (Hours)	No of Hours /week
			L	T	P	Total Credits	Marks of Class work	Theory	Practical	Total		
1	16MMA21C1	Metal Forming Analysis	4	0	-	4	50	100	-	150	3	4
2	16MMA21C2	Mechatronics & Product Design	4	0	-	4	50	100	-	150	3	4
3	16MMA21C3	Total Quality Management	4	0	-	4	50	100	-	150	3	4
4	16MMA21C4	Welding & Allied Processes	4	0	-	4	50	100	-	150	3	4
5	16MMA21CL1	Mechatronics Lab	-	-	2	2	50		50	100	3	4
6	16MMA21CL2	Welding Lab	-	-	2	2	50		50	100	3	4
7	16MMA21CL3	CAD/CAM Lab	-	-	2	2	50		50	100	3	4
8	16MMA21C5	Seminar	-		-	2	50	-	-	50		2
9	16MMA21D1 or 16MMA21D2 or 16MMA21D3 OR 16MMA21D4	Elective I	4	-		4	50	100		150	3	4
		TOTAL	**28**									

Elective I: Choose any one from the following three papers:
16MMA21D1 - INDUSTRIAL INSPECTION
16MMA21D2 - DESIGN AND METALLURGY OF WELDED JOINTS 16MMA21D3 - FOUNDARY TECHNOLOGY
16MMA21D4-DESIGN PLANNING CONTORL AND PRODUCTION SYSTEM

NOTE:

Examiner will set nine questions in total. Question One will be compulsory and will comprise short answer type questions from all sections and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

M.D.UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION
M.TECH 1st YEAR (MANUFACTURING & AUTOMATION)
SEMESTER 2
CBCS Scheme effective from 2016-17

Sl. No	Course Code	Subject	Credit Pattern				Examination Schedule (Marks)				Duration of Exam (Hours)	No of Hours/ week
			L	T	P	Total Credits	Marks of Class works	Theory	Practical	Total		
1	16MMA22C1	Mechanical Design-I	4	0	-	4	50	100	-	150	3	4
2	16MMA22C2	Diagnostic Maintenance & Monitoring	4	0	-	4	50	100	-	150	3	4
3	16MMA22C3	Seminar	-		-	2	50	-	-	50		2
4	16MMA22CL1	CIM Lab	-	-	2	2	50	-	50	100	3	4
5	16MMA22CL2	Diagnostic Maintenance & Monitoring Lab	-	-	2	2	50	-	50	100	3	4
6	16MMA22D1 or 16MMA22D2 or 16MMA22D3	Elective-II	4	0	-	4	50	100	-	150	3	4
7		Open Elective	3	0	-	3						
8		Foundation Elective	2	0	-	2						
	TOTAL					**23**						

NOTE: Examiner will set nine questions in total. Question One will be compulsory and will comprise short answer type questions from all sections and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

Elective II : Choose any one from the following three papers:

16MMA22D1 - QUALITY CONTROL TECHNIQUES
16MMA22D2 - FINITE ELEMENT METHODS
16MMA22D3 - ARTIFICIAL INTELLEGENCE IN MANUFACTURING

Open Elective: A candidate has to select this paper from the pool of Open Electives provided by the University.

Foundation Elective: A candidate has to select this paper from the pool of Foundation Electives provided by the University.

16MMA21C1- METALFORMINGANALYSIS

L	T	P	CREDIT	SESSIONAL:50 Marks
4	0	0	4	THEORY :100 Marks

TOTAL :150 Marks

DURATION OFEXAM. :3 Hrs.

Course Outcomes (CO'S): At the end of the course, the student shall be able to:
CO1 Understand application of finite element methods to metal forming processes.
CO2 Understand the formulations of plastic deformation problems for metal forming analysis.
CO3 Understand technology and analysis of important metal forming processesforging, rolling, extrusion, wire drawing, sheet metal forming processes.
CO4 Understand the thermos-mechanical problem formulation.
CO5 Analyse the effect of friction and lubrication in hot and cold working of materials

Unit 1

Stress-Strain relations inElasticand plasticDeformations ,True stress and true strain, true stress-strain curves, selection of stress-strain curves forcold and hot working, yield of isotropicplasticmaterial, yield criteria .Trescamaximum sheer-strain- energycriterion, plasticincompressibility, Poisson's ratio forplasticdeformation flowrule, application of theoryofplasticityforsolvingmetal forming Problems usingSlab method, Upperand lower Bound methods, Sliplinefield theory.

Unit 2

Technologyand analysis ofimportant metal formingprocesses- Forging, Roiling ,Extrusion. Wiredrawing ,Sheet Metal forming processes likeDeep drawing, Stretch forming, Bending, defects in various metal formingprocesses likerolling, forging, extrusion, wiredrawingand deep drawingand theircauses and remedial measures, Effects oftemperatureand strain rate in metal working, friction and lubrication in Hotand Cold working.

Unit 3

Lubrication in metal formingprocesses, principles and mechanism oflubrications, hydrodynamicand theirfilm lubrication, boundaryand extremepressurelubricants, solid lubricants ,lubricants used forrollingand cold drawing, forging,

Unit 4

Application of FiniteElement Methods to Metal Forming Processes-special Discretization ,Shapefunction,Stiffness matrices and theirassembly, Implicit and explicit formulations, Elasto -plasticapproximations, Lagrangian Vs Eularian schemes, Material integration schemes, auxiliaryequations forcontact, friction and incompressibility, Thermo-mechanical problem formulation

REFERENCEBOOKS:

1. Metal FormingAnalysis- R.H. Wagoner,CambridgeUniversityPress.
2. TheoryofElasticity-Dallyand Riley
3. Mechanical Metallurgy- Dieter,McGrawHill Inc.
4.An Introduction to the Principles ofMetal workingbyRowe, Arnold.
5. Metal forminganalysis byAvitzer, Mcgrawhill.

16MMA21C2-MECHATRONICS& PRODUCT DESIGN

L T P CREDIT **SESSIONAL:50 Marks**
4 0 0 4 **THEORY :100Marks**
TOTAL :150 Marks

DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO's): At the end of the course, the student shall be able to:
CO1 Understand conceptual design for mechatronics products based on potential custom requirements.
CO2 Analyze appropriate sensors and transducers and devise an instrumentation system
CO3 Understand design of a control system for effective functioning of mechatronics systems using digit electronics, microprocessors, microcontrollers and PLC.
CO4 Develop system model for mechanical system.

Unit 1

Introduction to Mechatronics systems and components, Principles of basic electronics-Digitallogic, number system logic gates, Sequence logic flipflop system, JK flipflop, D-flipflop.
Microprocess and their applications- Micro computer computer structure/ rnicro controlles, Integrated circuits-signal conditioning processes, various types of amplifiers, low pass and high pass filters.

Unit 2

Sensors-sensors and transducers. Displacement, position proximity sensors, velocity,force sensors. Fluid pressure temperature, liquid level and light sensors. Selection of sensors., Actuators ,Pneumatic and hydraulic systems, Mechanical actuation system
.Electri calactuation system .Other Electrical/ Electronichardwarein Mechatronicsystem.

Unit 3

Principles of Electronic system communication, Interfacing, A. D.andD.A. converters. Software and hardware principles and tools to build mechatronic systems.,Basic system models mathematicalmodels,mechanical and other system Building blocks.
System models-Engg.Systems, rotational ,translation ,elected mechanical ,Hydraulic mechanical system.,System Transfer functions. First-second ordersysteminseries

Unit 4 .

Design and selection of Mechatronics systems namely sensors line encoders and revolvers, steppe rand servomotors Ball screws, solenoids, line actuators and controllers with application to CNC system, robots, consumer electronics products etc, Design of a MechatronicProductusingavailablesoftwareCADpackages MATLAB and SIMULINK

REFERENCEBOOKS:

1. Mechatronics by W.Bolton ,published by Addison Worley Longman Pvt. Ltd. ,India Brander, Delhi.
2.Automation Production System and CIMS by Mikel P Grooer, Phentice Hall of India Pvt. Ltd, NewDelhi.
3. Production Systems and CIM, Groover,PHI.

4. Flexible Manufacturingsystems ,byMaleki, Prentic Hall.

16MMA21C3- TOTAL QUALITY MANAGEMENT

L	T	P	CREDIT	SESSIONAL:50 Marks
4	0	0	4	THEORY :100 Marks

TOTAL :150Marks

DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO's): At the end of the course, the student shall be able to:

CO1 Understand the concepts & dimensions of quality.
CO2 Understand the definition of quality given by different quality gurus.
CO3 Understand the quality at different stages.
CO4 Understand the hard, soft & human factors of quality.
CO5 Develop knowledge of tools & techniques, quality awards

Unit1

1. **TQM Perspective and TQM Implementation:**
   Quality, Chain Reaction ,Dimensions of Quality, Evolution Of Quality, Quality Control, Quality Assurance, Quality Planning, Quality Improvement, Quality Management, Total Quality Management, Cost Of Quality, Classification of Failure Cost, Reducing Costs, Juran's Model Of Optimum Quality Costs, Analysis of COQ For Improvement, Analysis Of External Nd Internal Failure Costs ,TQM, Elements Of TQM, Leadership For TQM, Deeming 14 Points For Top Management, TQM Tools And Techniques, PDSA, Barriers For TQM Implementation

Unit 2

2. **TQM principles and Strategies:**
   Customer Satisfaction & Employee Involvement.
   Service Quality, Features Of Services, The Kano Model ,Employee Motivation, Motivation Theory Of Individual Employees ,Effective Communications, Training And Mentoring ,Recognition And Reward.
   Continuous Process Improvement and Process Approach.
   Juran's Triology , Kaizan ,PDCA, Seven Quality Tools ,BPR ,Seven Deadly Wastes ,ETX Model, Lean Manufacturing, Kabana System, Cellular Manufacturing, Single Piece Flow,Zero Defects

Unit3

3. **Statistical Process Control & TQM Tools**
   The Seven Quality Control Tools, Standard Normal Distribution, AQL, Seven Management Tools, Benchmarking, QFD, Taguchi's Design, TPM, FMEA

Unit 4

4. **Quality Systems**
   ISO9000 standard, EMS14001, Quality Awards
   Supplier Partnership and Performance Measures-
   Importance Of Suppliers, Selection And Standards, Quality Audit, Product Audit, Vendor Rating System, PDCA For Measurements, Performance Measure Design, BSC.

REFERENCEBOOKS:

1. "Total QualityManagement "byOakland (Butterworth- Heinamann Ltd.)
2. "Managingfortotal qualityfrom Demingto Taguchiand SPC"byLogothetis N.(PHI)

3. "Total QualityControl"byFeigenbaum A.V.(MGH)
4. "Total Quality Management "by Besterfield Dale H(PearsonEducation)
5. "Aslicebyslice guideto TQM"byJohn Gilbert (AffiliatedEastWestPress).
6. "TheTQM toolkit- aguideto practical techniques fo rTQM"byWallerJenny, Allen Derekand BurnaAndrew (KoganPage

16MMA21C4- WELDINGANDALLIEDPROCESSES

L	T	P	CREDIT	SESSIONAL:50 Marks
4	0	0	4	THEORY :100 Marks

TOTAL :150Marks

DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO's):

At the end of the course, the student shall be able to:

CO1 Understand principles of various traditional and newer welding processes

CO2 Develop concept of welding specific materials such as plastics, stainless steel.

CO3 Develop concept and techniques of welding automation.

CO4 Analyze methods of advanced welding processes like underwater welding.

CO5 Analyze arc welding parameter section and types of metal transfer.

Unit 1

Introduction : Basic classification of welding processes, weld ability, weld thermal cycle, metallurgy of fusion welds, solidification mechanism and micro structural products in weld metal, epitaxial, cellular and dendrite solidification, metallurgical changes in weld metal, phase transformation during cooling of weld metal in carbon and low alloy steel, prediction of micro structures and properties of weld metal. Heat affected zone ,re-crystallization and grain growth of HAZ, gas metal reaction, effects of alloying elements on welding of ferrous metals.

Unit 2

Welding Arc :Arc efficiency, temperature distribution in the arc; arc forces, arc blow, electrical characteristics of an arc, mechanism of arc initiate on and maintenance ,role of electrodepolarityon arc behaviorand arcstability, analysis ofthearc.

Types of electrodes, AW Sand Indian system of classification and coding of covered electrode formild steel, Shieldinggases and associated mixtures

Unit 3

Meta transfer: Short circuit/dip transfer. Free flight. Globular type. Spray type, Forces affectingmetal transfer. Weld bead geometryand shapefactors, Weld dilution.

Electric arc welding principle, MIG:- welding equipment and processes ,shielding gas, types of metal transfer. Tungsten inert gas arc welding(GTAW):-welding equipment, electrodes, inert gases and torches. Submerged arc welding(SAW):-principle of processes ,applications, fluxes and weldingelectrodesused.CO2welding:-difference from MIG welding, Principle of operation, equipment, weldingparameters and applications.

Unit 4

Solid state welding : Introduction, main feature sand applications of Ultrasonic welding, Friction weldingand Explosivewelding friction stir processing and welding.

Welding of plastics : Difficulties in welding of Plastics, Processes for welding of Plastics.

UnderwaterWelding: Introduction ,methods and applications.

Automation in Welding: Introduction, Semi automatic welding, Automatic welding, Welding mechanization ,Flexible Automated Welding ,Robotic welding, Types of Welding Robots, Robot SelectionMechanics,Jointtrackingsystem.

REFERENCE BOOKS

1. Weldingprocesses &technologybyDr .R S ParmarKhannaPublishers
2. WeldingEngineering& TechnologybyDr. R. S .Parmar KhannaPublishers
3. Modern Arc Welding Technology by S.V. Nandkarni Oxford & IDH publishing Co. Principles ofWeldingTechnologybyL.M. Gourd ELBS/Edward Arnold
4. ThePhysics of weldingby LancasterPergaman Press.
5. The Metallurgy of welding by Lancster ;George Allen & Un win Ltd. U.K. Weldinghandbook,Vol.1&2,seventhedition;Americanweldingsociety. MetalHandbook,Vol6, 73;ASME
6. ProcedureHandbook of ARC welding; LincolnElectricCo.USA.
7. The Solid phase welding of metals by Tylecote ;Edward Arnold Pvt .Ltd. Welding&Welding TechnologyRichardL. Little ,McGrawHill. WeldingTechnologybyRossi;McGrawHill.
8. WeldingTechnologybyKoenigs bergerand Adaer; Macmillan.

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16MMA21CL1- MECHATRONICSLAB

L	T	P	CREDIT		
0	0	4	2	PRACTICAL :50Marks	SESSIONAL:50 Marks

TOTAL :100Marks

DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO's): At the end of the course, the student shall be able to:
CO1 Understand the various practical demonstrations of mechatronics.
CO2 To utilize the theories for designing digital system.
CO3 Selection of equipments and practical demonstration.
CO4 Prepare computer programme based on mathematical model

1. To verify truth table of various gates such as AND, OR, NOR NOT, etc
2. To realize a logic equation Y=AB+CD
3. Selection ofsensorforaparticularapplication from Catalogue/Internet.
4. Design a mechatronics product/system and incorporate application of mechatronics for enhancing product values
5 To studythehardware's and softwares ofmechatronics kit.
6 To move a table in X-direction within the range of proximity sensors using Control-X software.
7 To rotateat ableusingDAC system.
8 To move a table in Y-direction within the range of proximity sensors using Control-X software.
9 To ornament to with PLC.
10To run aconvey orwith computer.
11To studythemovemen to factuatingcylinders and sensors.
12To studymechatronic and the reinter facing in aCNC machine.
13 Lifeprediction from computer programmebased on mathematical model.

16MMA21CL2- WELDINGLAB

L	**T**	**P**	**CREDIT**	**SESSIONAL:50 Marks**
0	**0**	**4**	**2**	**PRACTICAL :50Marks**

TOTAL :100 Marks

DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO's): At the end of the course, the student shall be able to:
CO1 Understand heat flow in gas welding.
CO2 Analyse about bead geometry, hardness and microstructure of MIG,SAW and FCAW welding.
CO3 Understand underwater welding procedure

LIST OF EXPERIMENTS IN WELDING

1. To study Heat flow in Welding (Equipment

for use –Gas Welding equipment)

2.To study tensile property, Bead Geometry, Hardness of Bead, Micro structure of welding Bead in case of:

i) MIG Welding ii) TIG Welding

iii) SAW Welding iv)Arc welding

3 To study mechanical behavior (tensile strength Hardness of Bead, Micro structure of welding Bead ,impact strength ,corrosion and wear ,fatigue behaviour) in case of.

1. Friction stir welding
2. Friction stir processing

16MMA21CL3- CAD/CAM LAB

L	T	P	CREDIT	SESSIONAL:50 Marks
0	0	4	2	PRACTICAL :50Marks

TOTAL :100 Marks

DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO's): At the end of the course, the student shall be able to:

CO1 Review and train in CAD modeling.
CO2 use parametric CAD software for geometric modeling ofmechanical designs.
CO3 Translate production drawings to 3D CAD models.
CO4 Evaluate a mechanical design and optimize it using CAD, CAE software.
CO5 use 2D / 3D CAD and CAE for use in other courses and research thesis work

SECTION-I

1. Develop a general purpose code to carryout the Rotation of an object about an axis passing throught out points
2. Develop a general purpose code to carryout
   i) an Ortho graphic projection
   ii) Dimetric projection ,given fore shortening factor Fz
   iii) An Isometric projection.
   iv) A Perspective Projection given Zc ,IT
3. Develop general purpose code, given two arbitrary projections and the respective transformation matrices and the reconstructed coordinates of the vertices of the Object.
4. Develop a general purpose code to carry out the Reflection o fan Object about an arbitrary plane passing through Three points.

SECTION-II

1. Develop a general purpose code for integrated

i) Cubic Spline with Different Boundary conditions

ii) Bezier curve

iii)B- spline –its Various types and Best Fit B-spline. Given:

a)Coordinates of the Control Points

b)Boundary conditions, if any.

c)Order of the curve, If required, and Match the output cad/CAM package.

SECTION-III

1. Develop an optimized Tool Path for Economic Machining and generate the same in GUI(IDEAS/PRO-E/any CAD software)for interpretation
2. Study of Graphics Formats and Conversion from one format to another
3. Generate the Meshing of the CONICAL Cylindrical Surface (a part of stepped cylindrical surface) using any simulation Package
4. Study of Open GL programming for the customization of any CAD package
5. Development of following surface patches
   i) Bilinear Coons Patch
   ii) Tensor Product Bezier Surface

SECTION-IV

1. Solid Modelling Exercises using any CAD/CAM package. (fromagivenlistof10Tutorials)
2. Generative machining interpretation for various tool paths for machining of Curved surfaces.

List of Soft Core –I

16MMA21D1- INDUSTRIAL INSPECTION
16MMA21D2- DESIGN AND METALLURGY OF WELDED
JOINTS 16MMA21D3- FOUNDARY TECHNOLOGY
16MMA21D4- DESIGN, PLANNING AND CONTROL OF PRODUCTION SYSTEMS

16MMA21D1: **INDUSTRIAL INSPECTION**

L T P	Sessional : 50 Marks
4 0 0	Theory : 100 Marks
	Total : 150 Marks
	Duration of Exam : 3 Hrs

Course Outcomes (CO's): At the end of the course, the student shall be able to:
CO1 Understand about the types Gauges.
CO2 Complete understanding about measurement standards.
CO3 Understanding about the gears and threads.
CO4 Understanding surface textures with processes
CO5 Understand tolerances and their positioning with geometry

UNIT1.
Design consideration for Gauges and measuring instruments: material selection for gauges, hardness and surface finish, tolerance for linear and dimensional chains, limits, fits and tolerance as per Indian and international standards, design of plug gauge, snap gauge, center distance gauge

UNIT2.
Inspection of threads and gears : thread gauge design, thread size measurement by two wire and three wire methods, vernier gear tooth gauge design.

UNIT3
Surface textures: components of machined surface texture, specification of surface texture, surface roughness measuring device and techniques, design of pneumatic gauges in process gauging methods.

UNIT 4
Geometrical and positional tolerances
Geometrical and physical limitations in measuring devices.

REFERENCES:
1. Metrology:-1 .C. Gupta (Dhanpat Rai Pub.)
2. Engg. Metrology :- R. K. Rajput (S. K. Kataria and sons)
3. Metrology :- R. K. Jain.
4. PSG design data book for Gauge

16MMA21D2 . **DESIGN AND METALLURGY OF WELDED JOINTS**

L T P Sessional : 50 Marks
4 0 0 Theory : 100 Marks Total : 150 Marks Duration of Exam : 3 Hrs

Course Outcomes (CO's): At the end of the course, the student shall be able to:
CO1 Understand to predict and control of distortion in welded joints.
CO2 Calculate cost estimation of welded joints.
CO3 Understanding the effect of residual stress in welded joints.
CO4 Understanding weld metallurgy: thermal effect of welding on parent metal
CO5 Develop the application of welding automation for enhancing productivity

.UNIT 1.

Weld defects: common weld defects like weld cracks, LOP, LOF, porosity, blow holes etc., remedies and control, welding symbols.
Cost analysis of welded joints: costing factors of welding jobs fabrication cost, material cost, preparation cost, finishing cost,
overhead cost etc., economy in preparation and welding a job, labour accomplishment factor, cost calculation of welded jobs.

UNIT2.
Prediction and control of distortion: calculation of longitudinal contraction, transverse contraction, angular contraction due to single weld pass, control of welded distortion, and calculation of shrinkage. Residual stresses: introduction, types, effect of thermal stresses, control of residual welding stresses.
UNIT3.
Destructive and non destructive testing of welds: destructive tests, equipment required and test piece geometry for tensile test, bend test, impact test, hardness test, brittle and fatigue failure tests, non destructive tests for welds:-dye penetrate inspection, magnetic particle inspection etc.
Weldability tests: definition and concept of weldability, purpose and types of weldability tests such as hot cracking test, root cracking tests, hydrogen induced cracking test, cruciform test. UNIT4.
.Weld ability of metals: welding techniques, preparation of joints and electrode types for gray cast iron welding, aluminium welding, austenitic steels , titanium and its alloys.
Welding metallurgy: thermal effect of welding on parent metal, structure of fusion welds, effect of cooling rate, weld metal solidification and heat affected zone.
Automation in welding: introduction and concept, classification of welding automation, economics of welding automation.

REFERENCE BOOKS:
1. Modern welding technology:- carry H. B. (PH).
2. Welding technology: - A. C. Devis.
3. Welding and welding Technology : Little (TMH)
4. Welding technology : R. S. Parmar.
5. AWS - welding handbook (IV- VI) Edition.
6. Elements of machine design : Pandya and shah.

16MMA21D3 **FOUNDRY TECHNOLOGY**

L T P	Sessional : 50 Marks
4 0 0	Theory : 100 Marks
	Total : 150 Marks
	Duration of Exam : 3 Hrs.

Course Outcomes (CO'S): At the end of the course, the student shall be able to:
CO1 Design of pattern for a particular component to be manufactured
CO2 Understand the basic composition of various ferrous and non-ferrous metals and their application in casting process
CO3 Choose the appropriate furnace for the production of a particular material
CO4 Design of gating system for a particular component
CO5 Analyse adequate casting method based on quantity, application, mechanical properties and tolerances

UNIT 1
Items (Domestic and Engg.) made by foundry technology. Advantage and limitations of foundry technology and other manufacturing process.
Castability and factors favoring castability. Ferrous and Non ferrous casting metals and alloys and items made of them.
Melting furnaces for cast iron , cast steels, aluminium alloys, brass and bronzes.
Solidification of castings.
UNIT 2
Mold design considerations: Conceptual, functional and production phase. Pattern and core design considerations, traffic rules applications. Examples, case studies.
Gating system elements: objectives,practicalrules,optimal time filling, types of pouring basin, types of gates, types of
risers.
UNIT3
Special casting methods: Gravity die casting, cold chamber die casting, hot chamber die casting, investment casting, centrifugal casting,shell mold casting.continuous casting.
Rough cleaning (Fettling) and surface cleaning of castings.
Casting inspection.
UNIT 4
Repair and salvage of castings. .Heat treatment of castings.Quality control of castings.
Pollution control in foundry. Modernisation of foundry.

REFERENCE BOOKS:
1. Principal of metal casting by Richard W.Heine , Carl R Hoper. Philip C. RosenthaT, Tata Me Graw Hill.
2. Principal of foundary technology by P. L. Jain , Tata Me Graw Hill
3. Foundary practice by W.H. Salmon

16MMA21D4: DESIGN PLANNING AND CONTROL OF PRODUCTION SYSTEM L-T-P
4 0 0
Sessional :50
Theory :100 marks
Total :150 marks
Duration of Exam :3hrs

COURSE OUTCOMES:

Towards the end of the course, the students should be able to:
CO1 Develop life cycle approach to new product development and production system.
CO2 Develop the concept of break-even analysis, line balancing and relate it with practical industrial work.
CO3 Understand and generate MRP-I, MRP-II and ERP models for production and enterprise resource planning.
CO4 Estimating production requirement using various forecasting techniques.
CO5 Understand the criteria for sequencing & accordingly schedule the job on machines

UNIT 1
Introduction to production systems : Aim of production system, generalized model and types of production systems Features compiling service organizations, life cycle approach to production management.

UNIT 2
Product development and design : New product development and process selection, stages in new product development, ues of decision tree, Break even analysis, Make// buy decision, Problems for break even analysis non linearity in B.E. analysis, selection of location among alternatives - A case study, systematic layout planning, objectives , types, comparison and application of different types of layouts,.

UNIT 3
Assembling line balancing concept and problems for maximum line efficiency. Planning for production : Importance, objective and types of forecasting methods, Analysis and comparison standard error of estimate, Material Requirement planning, (MRP) objective, dependent demand, input to MRP, MRP model, Production schedule, MRP logic comparison.

UNIT 4
Sequencing & Scheduling : Criteria for sequencing, Priority sequencing and rules, n job 2 machine, n job 3 machine, n job m machine problems. Element of monitoring and follow up\

Reference Books ; 1. Production operations management : Buffa, Edwood 2. Elements of production , planning and control - Eilon Samuel A 3. Production control: A quantitative approach - Biegel. J 4. Industrial engineering and production management - MartandTelsang 5. Operations management- Theory and problems- Joseph Monks

16MMA22C1- MECHANICAL DESIGN-I

L	T	P	CREDIT	
4	0	0	4	

SESSIONAL:50 Marks
THEORY :100 Marks
TOTAL :150 Marks
DURATION OF EXAM. :3 Hrs.

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Course Outcomes (COs): At the end of the course, the student shall be able to:
CO 1- Expose the students to the Design for Production and for variable loading.
CO 2- Impart in depth knowledge of designing of screws and different types of fasteners.
CO 3- Design bearings, selection of bearings for different aspects & lubricants with their properties.
CO 4- Knowledge of gears, design of different types of gears with consideration of maximum power transmission and gear lubrication.
CO 5- Learn in depth knowledge of flywheels and their design.

Unit 1

Concept Desgin: Brain stormingmethod sandsketching

Unit 2

QualityFunction Development

Material Characteristics Mechanical, thermal and electrical properties.

Unit 3

Design :Design forassembly. Design formanufacturing.

Unit 4

.Production technologies: Metal forming ,casting ,maching, surface treatment, welding, bonding ,fastening ,clinching.

REFERENCEBOOKS:

1. QualityFunction development, L.Cohen.
2. ManfacturingEngg.: Principles forOrganization, D.T. Koenig.
3. Materials ScienceandEngineering: An Introduction,W.D. CallisterJr.
4. Handbook ofAluminum :AlloyProduction and Materials Manfacturing Vol.2,G.E.Totten.
5. CADSoftwareCatia,Dassault system.

16MMA22C2- Diagnostic Maintenance & Monitoring

L	T	P	CREDIT	SESSIONAL:50 Marks
4	0	0	4	THEORY :100 Marks
				TOTAL :150 Marks
				DURATION OF EXAM. :3 Hrs.

Course Outcomes (COs): At the end of the course, the student shall be able to:
CO 1- Expose the students to the Maintenance Management.
CO 2- Impart in depth knowledge of failures types and maintenance.
CO 3- have knowledge of condition monitoring.
CO 4- Knowledge of total productive maintenance.

Unit 1
Maintenance Management
Relevance of maintenance ,maintenance: an over view ,maintenance services ,problems of the plant manager, automation and maintenance ,maintenance objectives and costs, qualityand quality circle in maintence ,Engineeringreliability, maintainability

Unit 2
Failure analysis
Defect generation types of failures ,FTA ,FMEA,FMECA
Maintenance Types/systems
Planned and unplanned maintenance ,breakdown,
corrective,opportunistic,routine,preventive,predictive,CBM,Design out maintence

Unit 3
Condition monitoring
NDT concepts ,visual and temperarture monitoring, leakage monitoring,vibration monitoring, lubricant monitoringmethods ,equipments,ferrography,spectroscopy,cracksmonitoring,thicknessmonitoieng,corrosionmonitoing,noise monitoring,sound monitoring, smell monitoring

Unit 4
Total productive maintenance
Development and scope of concept ,tero technology,basic systems of TPM procedure and steps of TPM, productivity circle

Books:

Maintenanceplanningandcontrol-Kelly,A.Buttersworth&Co.1984
MaintenanceandsparepartsManagement–KrishananG,PrenticeHall–1991

16MMA22CL1- CIM LAB

L	T	P	CREDIT	SESSIONAL:50 Marks
0	0	4	2	PRACTICAL :50Marks

TOTAL :100 Marks

DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO): At the end of the course, the students will be able to:
CO1. Understand the basic features of CNC Machining Centres and CNC Turning Centres
CO2. Understand the part programming of CNC Machining Centres and CNC Turning Centres through live demonstrations of machining examples
CO3. Learn the basics of Automatic Guided Vehicles (AGVs) and Robotics
CO4. Learn about the basic knowledge about Coordinate Measuring Machine (CMM) and Machine Vision System

LISTOFEXPERIMENTS:

1. To studygeneral features ofMachiningCenter.
2. To preparetheCNC part program for machiningaprismaticcomponent on CNC machiningcentre.
3. To studythegeneral features ofaCNC Turningcenter.
4. To preparetheCNC part program formachiningof a Cylindrical Component.
5. Studyand Applications ofRoboticsystem in Automated storage andRetrieval system.
6. Application and Control ofroboticsystem inFlexible manufacturingSystem.
7. To studythegeneral features ofAutomated Guided Vehicle.
8. To studythe general configuration ofCMM and its Application in CIM environment.
9. MachineVision and QualityControl in CIM environment.
10. Studyand Applications ofConveyerSystem in CIM system.
11. Studyand applicationofCIM software

16MMA22CL2 – Diagnostic Maintenance & Monitoring Lab

L	T	P	CREDIT	SESSIONAL:50 Marks
0	0	4	2	PRACTICAL :50Marks

TOTAL :100 Marks

DURATION OF EXAM. :3 Hrs.

List of Experiments.

1. To study the introduction to maintenancetechniques. Preventive and predictive Maintenance
2. To study and perform Non-Destructive Testing techniques , liquid dyepenetrate and leak testing.
3. To study and perform, Boroscope , Flexiscope.
4. To study and perform Eddy current testing &Ultrasonic testing .
5. To study and perform Magnetic particle detection and Particle counter.
6. To study wear Analysis through thermography and Ferrography.
7. To study the applications of Diagnostic Maintenance to Industrial Machines and plants such as Sugar Industryor Textile Mills or Thermal Powerplant sand Railways.
8. To study the Maintenance planning and control of a large factory, work planning and work control.

Course Outcomes:

At the end of the course students will be able to

CO1 – Practically understand wear analysis through thermograph and Ferrography.

CO2 – practically study the maintenance planning and control of a large factory.

CO3- will be able to perform Non-Destructive Testing techniques.

List of Soft Core –II

16MMA22D1- QUALITY CONTROL TECHNIQUES
16MMA22D2- FINITE ELEMENT METHODS
16MMA22D3- ARTIFICIAL INTELLEGENCE IN MANUFACTURING

16MMA22D1- QUALITYCONTROLTECHNIQUES

L	T	P	CREDIT	SESSIONAL:50Marks
4	0	0	4	THEORY :100 Marks
				TOTAL :150Marks

DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO'S): At the end of the course, the student shall be able to:

CO1 Understand about the Concept of Quality control system and process capability study.

CO2 Analyze about process control charts and Errors.

CO3 Understand about the Inspection control methods.

CO4 Understanding about the probability theory, binomial and Poisson distribution .

CO5 Analyze product control, chance and assignable causes of Quality variation

UNIT I

Statistical concepts in Quality Control, variables and attributes, Graphical Representation ,Continuous and Discrete ProbabilityDistributions,control limit Theorem. Introduction to Quality Control, process Control and Product Control ,Chance and Assignable causes of Quality variation, Advantages of Shewhart control charts, Process Control charts for variables, X, R and P charts ,fixation of control limits, Type I and Type II Errors,

UNIT II

Theoryof runs, Interpretation of Out of Controlpoints, Probabilitylimits, Initiation of control charts ,Trial control limits ,Determination of aimed at value of Process Setting, Rational method of sub grouping, control chart parameters ,control limits and specification limits, Natural tolerance limits ,Relationship of a process in Control to upper and lower specification limits, process capabilitystudies.

UNIT III

Special control charts for variables, group control chart, control charts with large sub groups, control chart with reject limits, use of control limits for moving averages

Variables inspection and Attributes inspection ,Relative merits and demerits ,Control charts for Attributes ,p chart and n p chart, varying control limits ,high defectives and low defectives ,CUSU Mor Cumulative sum control chart, Average run length (ARL)Relative efficiencyorsensitivityofcontrol chart.

UNIT IV

Probability theory binomial and Poisson distribution, Acceptance Inspection, 100% Inspection, No Inspection and sampling Inspection , operating characteristic curve (O.C.curve). Effect of sample size and Acceptance number , type A and type B. O.C. curves, Single , Double and Multiple sampling Plans ,SS Plan. Acceptance/Rejection and Acceptance/Rectification Plans, Producers Risk and Consumer's Risk, Indifference Qualitylevel, Average Outgoing quality (AOQ)curve,AOQL ,quality protection offered by a samplingPlan,

REFERENCEBOOKS

1. Statistical Qualitycontrol byE.L. Grant
2. Qualitycontrol
and Industrial Statistics,byA.J. Duncan
3. Qualitycontrol byDaleH .Beste field
4. Total QualityControl byA. Y .Feigenboum
5. ElementaryS.O.L. by I.W .Burr, M. Dekkar.

16MMA22D2- FINITEELEMENTMETHODS

L	T	P	CREDIT	SESSIONAL:50 Marks
4	0	0	4	THEORY :100 Marks
				TOTAL :150 Marks
				DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO's): At the end of the course, the student shall be able to:

CO1 Understand the theories of linear system for finite element analysis.

CO2 Understand the theories of non-linear system for finite element analysis.

CO3 Develop the formulation of problem for analysis.

CO4 Analyse non-linear problem solution procedure.

CO5 Understand modeling of system with load, displacement and boundary Conditions

UNIT

I Review ofbasicFEMconcepts:

FEM Discretization and the Direct Stiffness Method: Basic concepts of structural modeling ,Review of the stiffness method of structural analysis ,Modeling stiffness ,loads and displacementboundaryconditions

Formulation of Finite Elements : Mathematical interpretation of finite elements , variation formulation ,Development of continuum elements, shape functions ,consistent loads, Iso parametric elements forplanestress, Numerical integration ,Convergence requirements.

Computer Implementation of the Finite Element Method: Pre processing: model definition ,Element level calculations, Equation assembly, Equation solver, Post processing: strain and stress recovery.

UNIT II

Advanced topics in linear problems : Static condensation and sub-structuring, Patched stand in compatibleelement ,p- formulation

Advanced Beam, Plateand Shell elements:

Timoshenko beam theory(shearlocking)

Plateand shell theory Thin plateand Mildin plate(shearand membranelocking)

Mixed formulation forplateand shell

Degenerated shell formulation Dynamicanalysis using FEM Consistent massand lumped mass, masslumping technique

Timeintegration methods: explicit, implicit ,explicit-implicitmethods.

Stability, convergenceand consistency

Hyperbolicsystems: structural dynamics and wave propagation

Parabolicsystem : transient the attransfer

Modal solution fornatural frequencies and modeshapes g. Modal Superposition method forstructural dynamics

Non linearanalysis

a. Non linearsolution procedures
b. Newton-Rapson,modified Newton-Rapson and secantmethods
c. Linesearch algorithm
d. Automatictimestep control

UNIT III

Material nonlinearity

a. Rateindependent elastic plasticitywith return-mapping algorithm
b. Isotropicand kinematic chardeningwith Baushingereffect c. Consistenttangent operator
d. Objectiverateand finiterotation elasto plasticity
e. Multiplicativedecomposition and finitedeformation elastoplasticity

Geometricnon linearity

a. Generalized strain and stress
b. Total and Updated L arrangingformulation c. Kirchhoffstress and Cauchystress

Boundarynon linearity

a. Frictionless contact problems
b. Penalty, Lagrangemultiplier, augmented Lagrange multiplier, and perturbed Lagrangemultiple methods
c. Frictional contact problems includingfrictional return mappingalgorithm
d. Rigid-flexiblecontactand flexible-flexiblecontact
e. Multiplicativedecomposition and finitedeformation elasto plasticity

UNIT IV

Geometricnon linearity

a. Generalized strain and stress
b. Total and Updated Lagrangian formulation c. Kirchhoffstress sand Cauchystress

Boundarynon linearity

a. Frictionless contact problems
b. Penalty ,Lagrangemultiplier ,augmented Lagrange multiplier ,and perturbed Lagrangemultiple methods
c. Frictional contact problems includingfrictional return- mappingalgorithm
d. Rigid-flexiblecontact and flexible-flexiblecontact Assignmentsand Tutorial are essential part ofthis course. Various programmingand formulation problems will be assigned through thecourseofstudy. In addition, students arerequired to completeoneprojects related to computer implementation ,application to plasticity, solvingnon linearstructural problem usingcommercial programs

16MMA22D**3- ARTIFICIALINTELLIGENCEINMANUFACTURING**

L	T	P	CREDIT	
4	0	0	4	

SESSIONAL:50 Marks
THEORY :100 Marks
TOTAL :150 Marks
DURATION OF EXAM. :3 Hrs.

Course Outcomes: Towards the end of the course, the students should be able to:
CO1 Understand knowledge acquisition and knowledge representation.
CO2 Apply artificial intelligence in manufacturing.
CO3 Understand expert system application.
CO4 Analyze state-of art expert system application.
CO5 Apply theoretical concepts to manufacturing problems

UNIT I

Definition, basic concepts of artificial Intelligence, scope, role and potential of artificial intelligencein manufacturing, Expertsystems,PopularA Iapplication.

UNIT II

Overview of Expert systems, architecture, comparison with procedural programming, developing Expert system of typical manufacturing domains,implementation and maintenance, state- of-art Expert system application, casestudy.

UNIT III

All theory problems, problem spaces and search, Heuristic search technique ,Knowledge acquisition and knowledge representation, predicate logic, procedurals, Declarative knowledge, forward V/ s backward reasoning AI architecture ,overview of advanced features ,n planning, learning, natural language processing, neural nets, fuzzy logic ,object oriented programs.

UNIT IV

Case studies, examples of AI, theoretical concepts to manufacturing problems ,CAD, CAPP, schedulingGT,CIM system.
Domains welding, casting, forming, metal cutting, maintenance

M.D UNIVERSITY

SCHEME OF STUDIES AND EXAMINATION

M.TECH 2nd YEAR (MANUFACTURING & AUTOMATION)

SEMESTER 3rd

CBCS Scheme effective from 2017-18

Sl. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	No of hours /week
			L	T	P	Total credits	Marks of Class works	Theory	Practical	Total		
1	17MMA23C1	Advanced metrology and calibration	4	0	-	4	50	100	-	150	**3**	**4**
2	17MMA23C2	Manufacturing Automation	4	0	-	4	50	100	-	150	**3**	**4**
3	17MMA23C3	Major Project (Dissertation Stage 1)	-	-	4	4	100	-	-	100		**4**
4	17MMA23CL1	Metrology & Automation Lab	-	-	2	2	50	-	50	100		**2**
5		Open Elective				3						
		TOTAL	**19**									

NOTE:

Examiner will set nine questions in total. Question One will be compulsory and will comprises of all sections and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

OPEN ELECTIVE

A candidate has to select this paper from the pool of open electives provided by the University.

M.D UNIVERSITY

SCHEME OF STUDIES AND EXAMINATION

M.TECH 2nd YEAR (MANUFACTURING & AUTOMATION)

SEMESTER 4th

CBCS Scheme effective from 2017-18

Sl. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				No of Credits
			L	T	P	Total	Marks of Class works	Theory	Practical	Total	
1.	17MMA24C1	Major Project (Dissertation Stage 2)	-	-	-	-	250	-	500	750	**20**
		TOTAL	**-**	**-**	**-**	**-**	**250**	**-**	**500**	**750**	

NOTE:

1. **Students have to publish a research paper in a journal / conference of the research work done in the semester.**

17MMA23C1-ADVANCEDMETEROLOGY&CALIBRATION

L	T	P	CREDIT	SESSIONAL:50
0	0	0	4	THEORY :100Marks
				TOTAL :150 Marks
				DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO): At the end of the course, the students will be able to:

CO1. Understand the basic features of measuring instruments like sine bar, callipers and depth gauge etc.

CO2. Learn the basics of metrology and measurement.

CO3. Learn about the basic knowledge of calibration of instruments.

UNIT–I

Fundamentaldeviationand itscalculations,effectoftoleranceonthefits,effectsof electroplating onthefitsand itssolution, shaft basisand holebasissystemand its applications,Go,No-Gogaugesdesign,toleranceposition andtoleranceforboltandnut. GeometricalTolerances.

Surfaceerrorsi.e.form,macroandmicroerrors,reasonsfor theseerrors.

Surface texture parameters, amplitude,spacing and hybrid,bearing ratio/ ABBOTT-Fire stonecurve,AverageSlope

UNIT– II

Measuringinstrumentforflatness& surfacefinishes,instrumentforgeometrical tolerances, profile projector, co-ordinate measuring machine,lasermicrometer, various grades ofslipgaugesandpingauges,autocollimeters,various types ofmicrometer

UNIT– III

Introductiontocalibration,calibrationofmechanicalmeasuringinstruments,micrometers depth-micrometer,verniercaliper,toolmakermicroscope,pin gauge,surfaceplate,dial gauges,opticalflats,slipgauges.

UNIT– IV

Calculationof uncertainty,bothAtype&Btype,formicrometers,vernierCalipersand co-ordinatemeasuringMachine

TextBooks:

1. EngineeringMetrologyAndInstrumentationbyR.K.Rajput
2. ISI–Standard919andISI-Standard4218.
3. GeometricalTolerancesIs:800(Part-I)–1985ISO1101–1983
4. EngineeringTolerancesbyH.G.Conwat

17MMA23CL1 – Metrology& Automation lab

L	T	P	CREDIT	SESSIONAL:50 Marks
0	0	2	2	THEORY :50 Marks
				TOTAL :100 Marks
				DURATION OF EXAM. :3 Hrs.

Course Outcomes (CO's): At the end of the course, the student shall be able to:

CO1 Understand the various practical demonstrations of automation of mechanical equipments.

CO2 To utilize the theories for designing feeder system

CO3 Selection of equipments and practical demonstration.

CO4 Operation of variety of software .

CO5 Computer programming on CNC machine

1.MeasurementsusingOpticalProjector/ToolmakerMicroscope.

2.MeasurementofalignmentusingAutocollimator/Rollerset

3.Measurementofcuttingtoolforcesusing
a)LathetoolDynamometer

b)DrilltoolDynamometer.

4.MeasurementsofSurfaceroughness,UsingTallySurf/MechanicalComparator

5. StudyandapplicationsofHydaulicsoftware.

6. StudyandapplicationsofPneumaticsoftware.

7. StudyandapplicationsofRoboticsoftware.

8. StudyandapplicationsofPLCsoftware.

9. Todesignanautomatedpartfeeder.

17MMA23C2-MANUFACTURING AUTOMATION

L	T	P	CREDIT
0	0	0	4

SESSIONAL:50 Marks
THEORY :100 Marks
TOTAL :150 Marks
DURATION OF EXAM. :3 Hrs.

Course Outcomes:

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

CO1 know various techniques of automatic material handling in a manufacturing organization.

CO2 understand the concept and interfacing of various pneumatic, hydraulic and software for automation of mechanical products /system.

CO3 understand control strategies, modeling and simulation in a manufacturing system.

UNIT-1

Introduction: AutomationinProductionSystem,Principles andStrategiesofAutomation,Basic Elements ofan AutomatedSystem,AdvancedAutomationFunctions,Levels ofAutomations,introductiontoautomationproductivity.

Materialhandlingsystems: OverviewofMaterialHandling Systems-Rotary feeders, oscillatingforce feeder, vibratory feeder,elevatortypeandCentrifugaltypefeeders,Principles andDesignConsideration, MaterialTransportSystems, StorageSystems.

UNIT-2

AutomatedManufacturingSystems: Components, ClassificationandOverviewof ManufacturingSystems, Manufacturing Cells,GT and CellularManufacturing, FMS, FMS andits Planning and Implementation, Flow lines &TransferMechanisms, FundamentalsandAnalysisof TransferLines,productdesignforautomaticassembly.

ControlTechnologies inAutomation: Industrial Control Systems,ProcessIndustriesVersesDiscrete-Manufacturing Industries,ContinuousVerses DiscreteControl, Computer Process and its Forms. Sensors,Actuators andother ControlSystemComponents.

UNIT-3

Evaluation of automatic production: product manufacturabiiity, orientation devices- active and passive devices,partsorientationandescapement.

Pneumaticandhydrauliccomponentsandcircuits:

Booleanalgebra,pneumaticsensorsandamplifiers,jetdestructiondevices,logicdevices,schimittrig geringdevices, developingpneumaticcircuitsforautomatic diecasting machine.

UNIT-4

Modelingand Simulationfor manufacturing Plant Automation: Introduction/needforsystemModeling,Building MathematicalModelofamanufacturingPlant,ModernTools-Artificialneuralnetworksinmanufacturingautomation,AIin manufacturing,Fuzzydecisionandcontrol, robotsand applicationofrobotsforautomation.

REFERENCEBOOKS:

1. Handbookofdesign,manufacturing and Automation:R.C. Dorf,JohnWileyandSons.

2. Automation,ProductionSystemsandComputerIntegrated Manufacturing,M.P.Groover,PearsonEducation.

3. IndustrialAutomation:W.P.David,JohnWileyandSons.

4. ComputerBasedIndustrialControl,KrishnaKant,EEE-PHI

5. AnIntroduction toAutomatedProcess Planning Systems, Tiess ChiuChang&RichardA.Wysk

6. ManufacturingassemblyHandbook:-BrunoLotter

7. AnatomyofAutomation,AmberG.H&P.S.Amber,PrenticeHall.

8. PerformanceModelingofAutomatedManufacturingSystems, Viswanandham,PHI.

9. AutomaticprocesscontrolsystemandHardware-R.P.

Hunter,PrenticeHall.

17MMA23C3 MAJOR PROJECT

(DISSERTATION STAGE-1)

Marks Credits -4

L	T	P	
-		4	Sessional Exam : 100

A candidate has to prepare a report covering identification of research topic, literature review, planning of research scheme and systematic documentation. The marks will be given on the basis of a report prepared and presentation given by the candidate covering the above said contents, contents of the presentation, communication and presentation skills.

COURSE OUTCOMES:

By the end of this course every student is expected to be able to

CO1 understand the process of research.

CO2 do literature survey to identify a research problem.

CO3 communicate and discuss research ideas.

CO4 plan and write dissertation synopsis.

17MMA24C1 DISSERTATION-II (IV sem)

COURSE OUTCOMES:

By the end of this course every student is expected to be able to

CO1 handle research problems and use modern research tools/methods.

CO2 analyse and review the existing literature on a research problem.

CO3 design and conduct experiments.

CO4 write dissertation and technical reports.

CO5 publish research papers.

M.D.U., ROHTAK
Session 2017-18

A) Foundation Elective Courses

Students of all PG programmes under CBCS (w.e.f. 2016-17) are required to study one foundation elective course in 2nd semester for 2 years Programmes and in 4th Semester for 3 years Programmes. They may choose any one of the following courses (excluding the courses offered by the departments of their own subjects, if not stated otherwise).

Sr. No.	Nomenclature of the course	Course Code	Offered by the Department of
1	Basics of Accounting	16COMF1	Commerce
2	Basics of E-Commerce	16COMF2	Commerce
3	Elements of Banking	16COMF3	Commerce
4	Computer Fundamentals	16CSAF1	Computer Science & Application
5	Appreciation of Short Stories	16ENGF1	English & Foreign Languages
6	Appreciation of Poetry & Prose	16ENGF2	English & Foreign Languages
7	Appreciation of Fiction	16ENGF3	English & Foreign Languages
8	Appreciation of Drama	16ENGF4	English & Foreign Languages
9	Moral Education	16GENF1	Genetics
10	Geography in Everyday Life	16GEOF1	Geography
11	Hindi language and Communication Skill	16HNDF1	Hindi
12	Entrepreneurship Development	16IMSF1	IMSAR
13	Communication and Soft Skills	16IMSF2	IMSAR
14	Media law	16LAWF1	Law
15	Appreciation of Indian Music	16MUSF1	Music
16	Psychology for Everyday Living	16PSYF1	Psychology
17	Electronics Engineering	16 ECE F1	UIET (Electronics & Communication)

(Foundation Elective Paper)
Basics of Accounting
Paper Code: 16COMF1

Total Marks: 50
External Marks: 40
Internal Marks: 10

Time: 3 Hours
Credits = 02

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of equal marks. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All questions shall carry equal marks

Unit-I

Meaning of Accounting, Accountancy and Book Keeping, Objectives of Accounting, Scope of Accounting, Types of Accounting, Limitations, Basic Accounting Terms, Double Entry System of Book Keeping, GAAP (Generally Accepted Accounting Principal), Basic accounting Equations

Unit-II

Journalizing: Classification of Accounts, Personal, Real and Nominal; Recording & posting of simple transactions only.

Unit-III

Preparation of Subsidiary Books: Cash Book(single column cash book) Purchase Book, Sales Book, Purchase Return, Sales Return Book, B/R and B/P Book.

Unit-IV

Preparation of Trial Balance, Preparing the Financial Statements Trading Account, Profit and Loss Account and Balance Sheet of sole proprietary business (Without Adjustment).

Suggested Readings:

1. D.K. Goyal: Financial Accounting, Arya Publications Pvt Ltd.
2. S.N. Maheshwari : An introduction to Accounting, Vikas Publishing House Pvt. Ltd.
3. Nishat Azmat and Andy Lymer: Basic Accounting: The step-by-step course in elementary accountancy, Kindle Edition
4. Anthony, R.N., a n d J.S. Reece, “Accounting Principles", Richard D. Irwin, Inc.
5. M onga, j.R., "Financial Accounting: Concepts and Applications", Mayoor Paper Backs, New Delhi.
6. Shukla, M.C., T.S. Grewal and S.C.Gupta, "Advanced Accounts", Vol-I, S.Chand & Co., New Delhi.
7. Gupta, R.L. and M. Radhaswamy, “Advanced Accountancy", Vol-I, Sultan C hand & Sons, New Delhi.

(Foundation Elective Paper)
Basics of E-Commerce
Paper Code: 16COMF2

Total Marks: 50
External Marks: 40
Internal Marks: 10
Time: 3 Hours **Credits = 02**

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of equal marks. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All questions shall carry equal marks

Unit-I

E-Commerce: Meaning, Concept, Definitions, Origin and Development, Categories of E-Commerce: B2B, B2C, B2G, G2G,G2C; The Constitution of the E-Commerce: Portal of the Network, Customer Relationship Management, Supply Chain Management, Logistic Management, Decision Support; Supporting Environment for E-Commerce: Technical Environment, Legal Environment, Credit Environment and Financial Environment.

Unit-II

M-Commerce: The Origin of M-Commerce, M-Commerce Components, The Development of M-Commerce, The Application of M-Commerce

Unit-III

Payment Technologies for E-Commerce: Online Bank, E-Payment Tools: E-Payment System, Intelligent Card, E-check, E-wallet, E-Cash

Unit-IV

Electronic Commerce: Influence on Marketing: Product, Physical Distribution, Price, Promotion, Marketing Communication, Common e-Marketing Tools

(Foundation Elective Paper)
Elements of Banking
Paper Code: 16COMF3

Total Marks: 50
External Marks: 40
Internal Marks: 10 **Time: 3 Hours**

Credits = 02

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of equal marks. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All questions shall carry equal marks

Unit-I

Introduction to Banking: Meaning, Concept, History of Banking, Business of Banking, Functions of Banking, Banker Customer Relationship, Recent Developments in Banking Industry: Corporate Banking, Retail Banking, International Banking, Rural Banking, Non-Banking Financial Intermediaries

Unit-II

Structure of Commercial Banks in India: Structure of Indian Banking System, Reserve Bank of India, Commercial Banks, Public Sector Banks, Private Sector Banks, Foreign Banks, Indian Banks vs. Foreign Banks.

Unit-III

Structure of Co-operative Banks in India: Co-operative Banks: Meaning, Definitions, Commercial vs. Co-operative Banks, Regional Rural Banks

Unit-IV

Structure of Apex Banking Institution in India: Meaning, Definitions, National Bank for Agriculture and Rural Development (NABARD), National Housing Bank (NHB), Small Industries Development Bank of India (SIDBI), Export Import Bank of India (EXIM Bank)

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

FOUNDATION COURSE

(16CSAF1)

COMPUTER FUNDAMENTALS

Total Marks: 50
External Marks: 40
Internal Marks: 10

Time: 3Hrs.

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit-I

Historical Evolution of Computing Systems: Overview of Data Processing, History of Computing, Computer Generations; Characteristics of Computer, Anatomy of Computer, Classification of Computers.

Number Systems and Codes: Introduction, Number Systems and its types, and inter-conversion of Number Systems; ASCII and EBCDIC codes.

Input and Output Devices: Concept of Input/Output, Types of Input Devices; Output Devices – Printers, Plotters and Monitors.

Unit-II

Memory and Storage Devices: Characteristics of memory systems, memory hierarchy, Types of Memory – RAM, ROM, etc.; Magnetic Disks, Magnetic Tapes, Optical Disks; Concept of Cache Memory and Virtual Memory.

Software and Operating System Concepts: Introduction, Software Types, Language translators, System Utility Software, Application Software; Operating System – Characteristics, its functions, and its classification; User Interfaces – CUI and GUIs. DOS and Windows operating systems.

Unit-III

Working with Office Tools:

Using Word Processing: Opening and Closing of documents, Text creation and Manipulation, Moving Around in a Document, Formatting of text, Table handling, Spell check, language setting and thesaurus, Handling Multiple Documents, Printing of word document.

Using Spreadsheet tool: Basics of Spreadsheet; Manipulation of cells, Formulas and Functions, Editing of Spread Sheet, Page setups, header and footer, printing of Spread Sheet.

Using Slide Presentation Tool: Basics of powerpoint, Preparation and Presentation of Slides, Slide Show, Formatting and Clip Arts, Taking printouts of presentation / handouts.

Unit-IV

Communication and Networks: Data Communication, Transmission Modes, Basics of Computer networks, types of computer network - LAN, MAN, WAN; Network Topologies and Applications of Computer Networks.

Internet Basics: Concept of Internet, Application of Internet, WWW, Web-sites and URLs, Search Engine, Using Electronic mails, Instant Messaging, Web Browsing software, Surfing the Internet.

Social Concern: Positive and Negative Impacts of Computer Technology, Computer Crimes, Computer Virus: Definition, Types of viruses, Characteristics of viruses, anti-virus software.

Computer Applications: Data Analysis, Sports, Research, Education, Business, Medicines & Health Care, Weather Forecasting, Military.

Suggested Readings:

1. Nasib Singh Gill: Handbook of Computer Fundamentals, Khanna Books Publishing Co.(P) Ltd., New Delhi, 2016.
2. P.K Sinha: Computer Fundamentals, BPB Publications.
3. Nasib Singh Gill: Computing Fundamentals and Programming in C, Khanna Books Publishing Co.(P) Ltd., New Delhi.
4. V. Rajaraman: Fundamentals of Computers, PHI
5. Microsoft Office – Complete Reference – BPB Publication
6. Norton Peter: Introduction to Computer, McGraw-Hill.
7. Leon, Alexis & Leon, Mathews: Introduction to Computers, Leon Tech World.
8. C.S. French: Data Processing and Information Technology, BPB Publications.

DEPARTMENT OF ENGLISH AND FOREIGN LANGUAGES
FOUNDATION COURSES
Odd Semester

Course Code: 16ENGF1

Nomenclature of the Course: Appreciation of Short Stories

Total Marks: 50
External Marks: 40 Lectures 2
Internal Marks: 10 Total Credits: 2
Time: 3 hrs

Prescribed Texts

William Carlos Williams:	"The Use of Force"
James Thurber:	"The Catbird Seat"
Ernest Hemingway:	"In Another Country"
John Henry Noyes Collier:	"Wet Saturday"
Dylan Thomas:	"The Enemies"

[**Prescribed Book**: Brooks, Cleanth, John Thibaut Purser, and Robert Penn Warren. *An Approach to Literature.*5th ed.]

Instructions to the Paper-Setter:

In Question 1, students will be required to explain one passage, out of the two given, with reference to the context. 8

In Question 2, students will be required to answer any four questions, out of the given six, in about 150 words each. 4 x 3 = 12

Questions 3 and 4 will be essay type questions. Both these questions carry 10 marks each.

Suggested Reading:

Currie, Gregory. *Narratives and Narrators.*

Davis, Robert Marry. Ed. *The Novel: Modern Essays in Criticism.*

Dietrich, R.F. and Roger H. Sundell. *The Art of Fiction.*

Miller, J. Hillis. *On Literature.*

Nayar, Pramod. K. *Studying Literature: An Introduction to Fiction and poetry.*

Scholes, Robert, and H. Klaus and Michael Silverman. *Elements of Literature.*

DEPARTMENT OF ENGLISH AND FOREIGN LANGUAGES
FOUNDATION COURSES
w. e. f. 2016-17 (Under CBCS)
Odd Semester

Course Code: 16ENGF2

Nomenclature of the Course: Appreciation of Poetry and Prose

Total Marks: 50
External Marks: 40 Lectures 2
Internal Marks: 10 Total Credits: 2
Time: 3 hrs

Unit I

Poetry

Wallace Stevens: "The Emperor of Ice-Cream"

Thomas Hardy: "Last Words to a Dumb Friend"

Ben Jonson: "To the Memory of my Beloved, the Author, Mr. William Shakespeare"

William Shakespeare: "Sonnet 66"

Geoffrey Chaucer: "The Prioress" (From *The Prologue*)

Robert Browning: "My Last Duchess"

[**Prescribed Book**: *Inside Poetry* by James Reeves and Martin Seymour-Smith]

Unit II

Essays

Charles Lamb: "The Two Races of Men"

Virginia Woolf: "The Death of the Moth"

Frances Bacon: "Of Studies"

Joseph Addison: "Female Orators"

Samuel Johnson : "Singularities Censured" (*Adventurer No. 131. Tuesday, February 5, 1754.*)

[Prescribed Book: *Elements of Literature* by Robert Scholes, H. Klaus and Michael Silverman]

Instructions to the Paper-Setter:

In Question 1, students will be required to explain one passage with reference to the context.

There will be one passage from each Unit.

8

In Question 2, students will be required to answer any four questions in about 150 words each.

There will be three questions from each unit.

4 x 3 = 12

In Questions 3 and 4 based on Units I and II respectively, students will be required to attempt critical appreciations. Both these questions carry 10 marks each.

DEPARTMENT OF ENGLISH AND FOREIGN LANGUAGES
FOUNDATION COURSES
Even Semester

Course Code: 16ENGF3

Nomenclature of the Course: Appreciation of Fiction

Total Marks: 50
External Marks: 40 Lectures 2
Internal Marks: 10 Total Credits: 2
Time: 3 hrs
Prescribed Texts

Unit I

Leo Tolstoy: *The Death of Ivan Ilych.*

(**Prescribed Book**: Kennedy, X.J. *An Introduction to Fiction.* Harper Collins, 1991).

Unit II

D.H. Lawrence: *The Man Who Died*

(**Prescribed Book**: *Interpreting Literature* (Fifth Edition) by K.L. Knickerbocker and H. Willard Reninger, Hold, Rinehart and Winston, Inc.1974).

Instructions to the Paper-Setter:

In Question 1, students will be required to answer any five questions in about 150 words each.

There will be four questions from each unit.

5 x 4 = 20

In Questions 2 and 3 based on Units I and II respectively, students will be required to attempt critical appreciations. Both these questions carry 10 marks each.

Suggested Reading:

Currie, Gregory. *Narratives and Narrators*.

Davis, Robert Murray.Ed. *The Novel: Modern Essays in Criticism.*

Dietrich, R.F. and Roger H. Sundell. *The Art of Fiction.*

Hudson, W.H. *An Introduction to The Study of English Literature.*

Miller, J. Hillis. *On Literature.*

Nayar, Pramod. K. *Studying Literature: An Introduction to Fiction and Poetry.*

Scholes, Robert, and H. Klaus and Michael Silverman. *Elements of Literature.*

DEPARTMENT OF ENGLISH AND FOREIGN LANGUAGES
FOUNDATION COURSES
Even Semester

Course Code: 16ENGF4
Nomenclature of the Course: Appreciation of Drama

Total Marks: 50
External Marks: 40
Internal Marks: 10 Total Credits: 2
Time : 3 hrs
Prescribed Text

William Shakespeare: *The Tempest*

Instructions to the Paper-Setter:

In Question 1, students will be required to explain one passage, out of the two given, with reference to the context. 8

In Question 2, students will be required to answer any four questions, out of the given six, in about 150 words each. 4 x 3 = 12

Questions 3 and 4 will be essay type questions. Both these questions carry 10 marks each.

Suggested Reading:

Interpreting Literature (Fifth Edition) by K.L. Knickerbocker and H. Willard Reninger, Hold, Rinehart and Winston.

Kennedy, X.J. *An Introduction to Fiction* by X. J. Kennedy.

Viva Modern Critical Interpretations of Shakespeare's The Tempest

Foundation course run by Department of Genetics.

(Foundation course)

MORAL EDUCATION

PaperCode:16GENF1

Total Marks: 50
External Marks: 40
Internal Marks: 10

Time: 2.00 Hours

Instructions

There will be a total of five questions. Question No. 1 will be compulsory and shall contain eight to ten short answer type questions without any internal choice and it shall cover the entire syllabus. The remaining four questions will include two questions from each unit. The students will be required to attempt one question from each unit. The students will attempt three questions in all.

UNIT I

Guiding principles for life

Ethics

a. Guidelines set by society
b. Changes according time and place

Morals

c. Guidelines given by the conscience
d. Always constant

Ethics in the workplace

a. Respect for each other
b. Obedience to the organization
c. Dignity of labour
d. Excellence in action

UNIT II

Concept of Trusteeship

a. Everything belongs to society
b. Man is only a caretaker
c. Our responsibility to ensure welfare of all

Importance of service

a. Responsibility of an individual
b. Man is only a caretaker
c Our responsibility to ensure welfare of all

MA Geography Semester-II
Foundation Course: 16GEOF1
GEOGRAPHY IN EVERYDAY LIFE

16GEOF1

Total Marks: 50
External Marks: 40
Internal Marks: 10

Learning Objectives

With spatial turn in the other social sciences and humanities and cultural turn in geography the spatial structure has begun to be seen not merely as an arena in which social life unfolds but rather as a medium through which social relations are produced and reproduced. All this has strengthened geography as a multidisciplinary and interdisciplinary discipline. Geography deepens understanding of many contemporary issues and challenges - climate change, food security, energy choices – that cannot be understood without a geographical perspective. It serves vital educational goals: thinking and decision making with geography helps us to live our lives as knowledgeable citizens, aware of our own local communities in a global setting. What we need is a global sense of the local, a global sense of place.

Learning Outcome

On completion of the course a student should be able to understand how geography permeates each and every aspect that concerns our living on this earth. They would know how Geography can use its versatility and multi-factor approach, co-existence between physical and human aspects, construction of ideas around space which are politically and administratively relevant, to its best advantage.

Unit I

Geography and Environment; Geography and Social Sciences; Geography and Development; Geography and Planning

Unit II

Geography and Governance; Geography and Globalization; Geography and Disasters; Geography and Cartography

Note: (i) The question paper will have three units. First two units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt two questions in all selecting one from each unit. Unit III shall be compulsory and shall contain five short answer type questions covering entire syllabus in which candidates will be required to attempt any five out of eight questions. All questions carry equal marks.

(ii) Internal Assessment of 10 marks will be 'Map Filling' about the location of important places, landforms, and geographical features in India and the world. The unit three shall be compulsory and shall contain five short answer type questions covering entire syllabus.

Recommended Readings

Daniels, Peter, Michael Bradshaw, Denis Shaw, and James Sidaway. 2012. An Introduction to Human Geography. 4th edition. Pearson Education Ltd. Harlow, England.

Herod, Andrew. 2009. Human Geography: the basics, Routledge, New York.

Hopper, Paul. 2012. Understanding Development: Issues and Debates, Polity Press. Cambridge, UK,.

Kant, Surya and Nina Singh ed. 2015. Geography Development Public Policy: Select Essays of Gopal Krishan. RK Books, New Delhi.

Kapur, Anu. 2010. Vulnerable India, Sage Publications, New Delhi.

Knox, Paul. 2014. Atlas of Cities. Princeton University Press.

Oxford Atlas of the World. 2015. 22nd edition. Oxford University Press.

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16HNDF1

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ENTREPRENEURSHIP DEVELOPMENT

Total Marks: 50
External Marks: 40
Internal Marks: 10

Course Code: 16IMSF1

Course Objective:
This course aims to acquaint the students with challenges of starting new ventures and enable them to investigate,
understand and internalize the process of setting up a
business.

Unit-I
Entrepreneurship: Concept, knowledge and skills requirement; characteristics of successful entrepreneurs; role of entrepreneurship in economic development; entrepreneurship process; factors impacting emergence of entrepreneurship

Uniti-II

Starting the venture: generating business idea – sources of new ideas, methods of generating ideas, opportunity recognition; environmental scanning, competitor and industry analysis; feasibility study – market feasibility, technical/operational feasibility, financial feasibility: drawing business plan

Unit -III
Functional plans: marketing plan – marketing research for the new venture, steps in preparing marketing plan, contingency planning; organizational plan – form of ownership, designing organization structure; financial plan – cash budget, working capital

Unit -IV
Sources of finance: debt or equity financing, commercial banks, venture capital; financial institutions supporting entrepreneurs; legal issues – intellectual property rights patents, trademarks, copyrights, trade secrets, licensing

Suggested Readings:

1. Hisrich, Robert D., Michael Peters and Dean Shephered, Entrepreneurship, Tata McGraw Hill, New Delhi
2. Barringer, Brace R., and R. Duane Ireland, Entrepreneurship, Pearson Prentice Hall, New Jersy (USA)
3. Lall, Madhurima, and Shikha Sahai, Entrepreneurship, Excel Books, New Delhi
4. Charantimath, Poornima, Entrepreneurship Development and Small Business Entreprises ,
5. Pearson Education, New Delhi

6. Kuratko, Donand and Richard Hodgetts, Entrepreneurship, Cengage Learning India Pvt. Ltd., New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section 'A'** shall comprise of eight short answer type questions from whole of the syllabus carrying one mark each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section 'B'** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks

COMMUNICATION AND SOFT SKILLS
Course Code: 16IMSF2

Total Marks: 50
External Marks: 40
Internal Marks: 10

Time Allowed: 3 Hours

Course Objective:
The objective of this course is to expose the students to basic communication and soft skills and to familiarize them with behavioral skills and business etiquettes.

Unit -I
Communication Skills - Concept, characteristics and process of communication; 7C's of communication; listening skills, verbal communication, non-verbal communication, body language, art of meeting and greeting, making effective conversation

Unit -II
Presentation Skills - Difference between speech and presentation, handling of presentation audience questions, holding meetings, group discussion and interviews; structuring a presentation, delivering the presentation; situational presentation

Unit -III
Behavioral Skills - Positive altitude, self-management, problem solving skills, time management skills, anger management, coping skills, assertiveness team building skills

Unit -IV
Business Etiquette - Business dress and grooming, office courtesies, etiquette for special occasions, meeting etiquette, dining etiquette

Suggested Readings:

1. Kaul, Asha, The Effective Presentation, Response Books, New Delhi
2. Fox, She, Business Etiquette for Dummies, Wiley Publishing inc.
3. Chaney, Lillian and Janette Martin, The Essential Guide to Business Etiquette, Praeger, London
4. Sanghi, Seema, Towards Personal Excellence, Response Books, New Delhi
5. Sherfield, Robert M, R J Montgomery and Patricia G Moody, Developing Soft Skills, Pearson Education, New Delhi
6. Chancy, Lillian and Janelte Martin, The Essential Guide to Business Etiquette, Praeger, Londonson Edueation, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section 'A'** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section 'B'** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

LL.M. SECOND SEMESTER EXAMINATION

(Media Law)

16LAWF1

Total Marks: 50
External Marks: 40
Internal Marks: 10

Time Allowed: 3 Hours

The question paper of each course will be divided into two sections A & B, Section A consists of Eight Small answer type questions (without internal choice) carrying 3 marks each covering the entire syllabus. This section as such will be compulsory. Section-B shall again consist eight questions carrying 14 marks each covering the entire syllabus. However, the candidate shall be required to attempt any four questions from this section.

NOTE FOR STUDENTS

Attempt all questions in Section A and Four Questions from Section B. Each Question in Section A carries 3 marks and each question in Section B carries 14 marks.

Unit: I. Introduction: Evolution of Media; Types of media: Print, Electronic; E-Media free flow of Information beyond boundaries and barriers; Difference between Visual and non-Visual Media- impact on People

Unit: II. Freedom of Speech and Expression- Article 19 (1) (a): An Introduction to Freedom of expression; Evolution of Freedom of Press; Restrictions under Constitution: Article 19 (2), Government power to legislate0- Article 246 read with the Seventh Schedule.; Power to impose Tax- licensing and licence fee; Advertisement & Ethics: Misleading Advertisement vis-à-vis Consumers rights.

Unit: III. Law of defamation and obscenity: Defamation; Libel, Slander; Obscenity; Sedition

Unit: IV. Development of laws relating to Mass Media via a vis International regime: Censorship of films; Censorship under Constitution; Censorship under the Cinematograph Act; Pre- censorship of films.

Select Bibliography:

- M.P. Jam, Constitutional Law of India (1994) Wadawa, Nagpur
- H.M. Seervai, Constitutional Law of India 2002 Vol. 1 Universal
- John B. Howard, "The Social Accountability of Public Enterprises" in Law and Community Controls in New Development Strategies (International Center for law in development 1980)
- Bruce Michael Boys, Film Censorship in India: A Reasonable Restriction on Freedom of Speech and Expression" 14 J.I.L.l 501 (1972)
- Rajiv Dhavan "On the Law of the Press in India" 26J.l.L.l 288(1984)
- Rajeev Dhavan "Legitimating Government Rhetoric: Reflections on Some Aspects of the Second Press Commission" 26 J.l.L.I 391 (1976)
- Soli Sorabjee, Law of Press Censorship in India (1976)
- Justice E.S. Venkaramiah, Freedom of Press: Some Recent Trends (1984)
- D.D. Basu, The Law of Press of India (1980)

Semester-2(Music)
Appreciation of Indian Music
16MUSF1

Paper Code	Core	Nomenclature of Papers	Maximum Marks	Internal Assessment Marks	Total Marks	Credit
16MUSF1	Foundation Elective	Appreciation of Indian Music	40	10	50	2

Structure of LTP

Lecture	Tutorials	Practical
3	1	0

Unit-I

- The study of sound and concept of Naad/swar
- Brief history of Indian Music
- Study of Technical terms of Indian Music
- An instroduction to Raga

  Classification of Raga

  Component/technical terms & structure of presentation of Raga

Unit-II

- Rhythm & Music

  Laya & Taal

  Writing of basic taalas-teental, ektaal, rupak, jhaptaal
- Writing an essay of 1000 words on relationship between Music and the subject belongs to you
- Music therapy and its impact on human body
- Different kind of compositional forms and their evolution
- Understanding music through Rag Mala painting

Department of Psychology

PAPER- (16PSYF1)

Psychology for Everyday Living

Credits : 2 (2Credit Theory:2 hrs/week

Total Marks: 50
External Marks: 40
Internal Marks: 10

Time Allowed: 3 Hours

Note:

a) *Nine questions would be set in all. Candidates would be required to attempt five questions.*
b) *There would be two questions (8 marks each) from each of the four Units. Candidates would attempt one question from each Unit.*
c) *Question No. IX would be compulsory. It shall be based on the entire syllabus and would contain eight short answer questions of one marks each*

Unit I

Science of Psychology: Definition, Goals, Basic and Applied areas of Psychology.

Self: Nature of self, Self-Regulation and Personal Growth.

Unit II

Intelligence: Definition; Theories: Theory of multiple intelligences, Triarchic theory, Emotional Intelligence.

Administration: Any one test of Intelligence/Emotional Intelligence.

Unit III

Personality: Definition;Theories: Trait and Type: Eysenck; Psychoanalytical: Freud; Humanistic: Maslow.

Administration: Any one objective test of Personality.

Unit IV

Stress and Coping: Nature of Stress; Sources; Stress reactions; Factors that influence reactions to stress.

Coping with stress: Modifying environment; Altering lifestyle.

Recommended Books:

Khatoon, N. (2012). General Psychology. Pearson: Delhi.

Baron, R.A. and Misra, G. (2016). Psychology. Pearson: Delhi.

Ciccarelli, S.K. and Meyer, G.E. (2006). Psychology. Pearson: Noida

FOUNDATION ELECTIVE COURSE

16ECEF1 ELECTRONICS ENGINEERING

		Marks	Credits
Exams	:	100	2
Sessionals	:	50	
Total	:	150	2
Duration of Exam	:	3 hrs.	

Instructions for setting of paper: Nine questions are to be set in total. First question will be short answer question covering whole syllabus and will be compulsory to attempt. Next eight questions will comprise of two questions each from the four sections. Student will be required to attempt four more questions selecting one from each section. Each question will be of 20 marks

UNIT 1

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 2

TRANSISTOR: Bipolar junction transistor : operation, characteristics, Ebers-moll model of transistor, CE, CB, CC configurations.
TRANSISTOR BIASING :Operating point, bias stability, collector to base bias, self-bias, emitter bias, bias compensation, thermistor & sensistor compensation.

UNIT 3

FIELD EFFECT TRANSISTORS: Junction field effect transistor, pinch off voltage, volt-ampere characteristics, small signal model, MOSFET Enhancement & Depletion mode, V-MOSFET. Common source amplifier, source follower, biasing of FET, applications of FET as a voltage variable resistor (V V R).

UNIT 4

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 flip-flops (S-R & J-K).

TEXT BOOK :

1.Integrated Electronics: Millman & Halkias ; McGrawHill
2.Modren Digital Electronics: R.P. Jain; McGraw-Hill

REFERENCE BOOKS:

1.Electronics Principles: Malvino ; McGrawHill
2.Electronics Circuits: Donald L. Schilling & Charles Belove ; McGrawHill
3.Electronics Devices & Circuits: Boylestad & Nashelsky ; Pearson.

M.D.U., ROHTAK

A) Open Elective Courses

Students of all PG programmes under CBCS (w.e.f. 2017-18) are required to study one open elective course in each of the 2nd and 3rd Semesters for 2-Years Programmes and in each of the 4th and 5th semesters for 3-Years Programmes. They may choose any one of the following courses (excluding the courses offered by the departments of their own subjects, if not stated otherwise).

Open Elective Courses of 2nd Semester:-

Sr. No.	Nomenclature of the course	Course Code	Offered by the Department
1.	Introduction to Bioinformatics	16BINO1	Bioinformatics
2.	Principles and Applications of Agriculture Biotechnology-I	16CBTO1	Biotechnology
3.	Principles and Applications of Biotechnology-I	16CBTO3	Biotechnology
4.	Basic Biochemistry	16BCHO1	Bio-Chemistry
5.	Plant Resource Utilization	16BOTO1	Botany
6.	Cyber Forensic & Security	16CSAO1	Computer Science & Applications
7.	National Security of India	16DSSO1	Defence & Strategic Studies
8.	Basics of Economics	16ECOO1	Economics
9.	Fundamental Aspects of Education	16EDUO1	Education
10.	Environmental Issues	16ENVO1	Environmental Science
11.	Food Adulteration	16FTEO1	Food Technology
12.	Genetics & Society	16GENO1	Genetics
13.	Basics of Geoinformatics	16GEOO1	Geography
14.	Geography of India Systematic and Regional	16GEOO2	Geography
15.	Nationalism in India	16HISO1	History
16.	Fundamentals of Management	16IMSO1	IMSAR
17.	Media & Society	16JRMO1	Journalism
18.	Family Law	16LAWO1	Law
19.	Academic Integrity & Plagiarism	16LISO1	Library & Information Science
20.	Mathematical Techniques and Applications	16MATO1	Mathematics
21.	Parametric & Non-Parametric Tests	16MATO2	Mathematics
22.	Principles of Medical Biotechnology I	16MBTO1	Medical Biotechnology
23.	Microbial World-Diversity and Applications	16MCBO1	Microbiology
24.	Sources of Energy-I	16PHYO1	Physics
25.	Administrative Literacy	16PUBO1	Public Administration
26.	Disaster Management - I	16POLO1	Political Science
27.	Ancient Indian Culture & Philosophy	16SKTO1	Sanskrit
28.	Understanding Sociology	16SOCO1	Sociology

29.	Quantitative Techniques	16STAO1	Statistics
30.	Sampling & Estimation Techniques	16STAO2	Statistics
31.	Computer Science Principles	16CSEO1	UIET (Comp. Sc. & Eng.)
32.	Software Engineering Practices	16CSEO2	UIET (Comp. Sc. & Eng.)
33.	Business skills for Biotechnologists	16MBTO1	UIET (Biotech)
34.	Operations Research	16MMEO1	UIET (Mech. Eng.)
35.	Multimedia Communication	16ECEO1	UIET(Electronics & Comm
36.	Applied Zoology	16ZOOO1	Zoology

CENTRE FOR BIOINFORMATICS

M. D. UNIVERSITY, ROHTAK

CBCS-SCHEME OF EXAMINATION (M.Sc. -Bioinformatics)-2016-17 onwards

Course Title: Introduction to Bioinformatics Credit: 3 0 0

Course Code: 16BINO1 MM. Th 80+ IA 20 Time: 3 Hours

Note: In all 7 questions are to be set, Question No. 1 is compulsory and to be set covering entire Syllabus. 6 questions will be set with two questions from each unit. Students are required to attempt one compulsory question and 4 other questions, *i.e.*, selecting atleast one from each unit.

UNIT I

Overview of Bioinformatics and Information technology: History, scope and application, Internet and World Wide Web; Generation of computers; Concept of networking; Internet protocols – OSI model; TCP/IP models.

UNIT II

Bioinformatics resources: Biological databases, Basic classification – Sequence & Structure; Generalized & Specialized; Primary & Secondary, with example databases .

Omics science: Introduction to genomics, proteomics, metabolomics, interactomics.

UNIT III

Bioinformatics tools: Information retrieval system (Entrez, SRS); Sequence alignment tools (BLAST, FASTA, CLUSTAL-W/X, MUSCLE, TCOFFEE), Variants of BLAST (BLASTn, BLASTp, PSI-BLAST, PHI-BLAST, etc).

M.Sc Agriculture Biotechnology **Semester-II**

Course Title: Principles and Applications of Agriculture Biotechnology-I

MM. Th 80+IA 20

Time: 2 h

Course Code No. 16CBTO1

NOTE: In all four questions will be set, two from each unit and one compulsory question of short answer type covering all the two units. Students are required to attempt one compulsory question and two other questions selecting at least one from each unit.

Theory

UNIT I

Tools and techniques used in agriculture biotechnology, restriction digestion (restriction endonucleases, types and mechanism), ligases, alkaline phosphatases, polynucleotide kinase, SI nuclease, DNAse, RNAse, scoreable and selectable markers. PCR, C-DNA and genomic libraries.

UNIT II

Plant tissue culture and its application in crop improvement. Recombinant DNA technology and cloning vectors, Different methods of gene transfer in plants (*Agrobacterium* mediated transfers, microinjection, eletroporation, somatic cell hybridization).

UNIT III

Genetic and Molecular basis of Heterosis and Apomixis and their significance, Mutations and polyploidy in crop improvement, Molecular markers, Marker assisted breeding, QTL mapping, Origin, evolution and cultivation practices of the major crop plants. Improvement of crop plants: increase in iron, protein and amino acids, golden rice colours – anthocyanins, betalaines, crocin and crocetins. Flavours–capsaicin, vanillin, stevioside thaumatin. Developing vaccine and plantibodies, terminator technology and male sterility

Suggested readings:

1. Hou CT, Shaw JF (2009) – Biocatalysis and agricultural biotechnology, CRC Press, USA
2. Agricultural biotechnology, 1st edition, (2008) Rawat H, Oxford Book Co, India.
3. Agrobiotechnology and plant tissue culture, Bhojwani SS, Soh WY, Oxford & IBH Publ, India
4. Agricultural biotechnology, (2005), Kumar HD, Daya Publ House, India
5. Plant molecular breeding, (2009), Newbury HJ, John Wiley and Sons., USA.
6. Embryology of Angiosperms, (2009), S.S. Bhojwani and S.P. Bhatnagar, Vikas Publ House, India.
7. Ashwani Kumar, Shekhawat NS (2009) – Plant tissue culture and molecular markers: theor role in improving crop productivity (IK International) 8. Biotechnology, 4th edition, (2010), H K Das, Wiley India Pvt. Limited, India
8. Biotechnology, 4th edition, (2010), H K Das, Wiley India Pvt. Limited, India

M.Sc Biotechnology **Semester-II**
Course Title: Principles and Applications of Biotechnology-I

MM. Th 80+IA20
Time: 2 h

Course Code No. 16CBTO3
NOTE: In all four questions will be set, two from each unit and one compulsory question of short answer type covering all the two units. Students are required to attempt one compulsory question and two other questions selecting at least one from each unit.

UNIT I

Molecular cloning tools; Restriction modification systems: Types I, II and III. Mode of action and nomenclature, DNA modifying enzymes and their applications: DNA polymerases, DNA phosphatases, and DNA ligases; Cloning Vectors: Definition and Properties, Plasmid vectors: pBR and pUC series; Bacteriophage lambda and M13 based vectors, Cosmids, BACs, YACs, linkers and adaptors.

UNIT II

Protein expression vectors: *E. coli* lac and T7 promoter based vectors, yeast YIp, YEp and YCp vectors, Baculovirus based vectors, mammalian SV40 based expression vectors, Methods in Molecular Cloning, Transformation of DNA: Chemical method & Electroporation; Gene delivery: Microinjection, electroporation, biolistic method (gene gun), liposome and viral mediated delivery, Agrobacterium mediated delivery, in vitro culture of plant and animal cells

UNIT III

DNA Amplification and DNA sequencing; PCR, RT-PCR, Sanger's method of DNA Sequencing: traditional and automated sequencing, Introduction to next generation sequencing, Chromosome walking & jumping, shotgun sequencing. Preparation, uses and screening of Genomic and cDNA libraries; Colony hybridization and colony PCR applications of Recombinant DNA Technology; Products of recombinant DNA technology: Products of human therapeutic interest-insulin, antisense molecules, Applications of recombinant DNA in crop improvement, Gene therapy, Recombinant vaccines, Protein engineering, Site directed mutagenesis and Biosensor technology

Suggested readings:

1. Brown, TA (2010) Gene Cloning and DNA Analysis: An Introduction, Sixth Edition. A John Wiley & Sons, Ltd., Publication, Germany.
2. Clark DP, Pazdernik NJ (2009) Biotechnology: Applying the Genetic Revolution. Elsevier Academic Press, USA.
3. Primrose SB, Twyman RM (2006) Principles of Gene Manipulation and Genomics, 7th Edition. Blackwell Publishing, Oxford, U.K.
4. Wiley JM, Sherwood LM, Woolveron CJ (2008) Prescott, Harley and Klein's Microbiology. McGraw Hill Higher Education.
5. Primrose SB and Twyman RM (2008) Genomics: Applications in human biology. Blackwell Publishing, Oxford, U.K.

Open Elective papers offered by Department of Biochemistry

16BCHO1: Basic Biochemistry

Note: Question 1 will be compulsory and will cover the entire syllabus in the form of short questions. Question 2 to 7 will include three questions from each unit and candidate will have to attempt two questions from each unit. Overall, three questions to be attempted. All questions to carry equal marks(16).

MM. Th 80+IA 20

UNIT I:

*Cell***:** definition, general structure and size of some important cells, general functions of cell organelles, basic difference in prokaryotic and eukaryotic cells

Carbohydrates: Definition, classifications and sources of carbohydrates, occurrence and biological functions of monosaccharides, disaccharides, and polysaccharides

*Lipids***:** Introduction, classification and functions of lipids. Saturated and unsaturated fatty acids.Essential fatty acids.Triacylglycerides and their properties,

*Amino acids***:** Nutritionalclassification of amino acids and physical properties of amino acids.
*Proteins***:** Definition, types, sources, properties and biological significance of proteins,Primary, secondary, tertiary and quaternary structure of proteins.

UNIT 2:
Nucleic acids: Nucleotides & nucleosides, types of DNA and RNA, evidence that DNA is the genetic material, feature of DNA double helix, Size of DNA in prokaryotic and eukaryotic cells.
*Vitamins***:** Sources, examples and classification, important functions of fat soluble and water soluble vitamins
Enzymes: History, general characteristics, nomenclature and IUB classification of enzymes, holoenzyme, apoenzyme, coenzymes, prosthetic groups, cofactors, activators, inhibitors, active site, metalloenzymes and isozymes, Units of enzyme activity, examples of some clinically important enzymes

Factors affecting enzyme activity: pH, temperature, time of incubation, enzyme concentration and substrate concentration. Properties of allosteric enzymes and their significance.

Suggested Readings for 16BCHO1: Basic Biochemistry:

1. Lehninger Principles of Biochemistry 4th Ed ***By*** David L. Nelson and Michael M. Cox, WH Freeman and Company.
2. Principles of Biochemistry ***By*** Geoffrey Zubay. Publisher: McGraw Hill College.
3. Biochemistry: The Molecular Basis of Life ***By*** Trudy McKee and James R McKee. Publisher: McGraw-Hill Higher education.
4. Biochemistry: Biomolecules, Mechanisms of Enzyme Action and Metabolism Vol 1 ***By*** D Voet. John Wiley and Sons.
5. Biochemistry ***By*** U. S. Satyanarayana
6. Outlines of Biochemistry ***By*** Eric C Conn, PK Stumpf, G Bruening and Ray H. Doi. John Wiley & Sons.

DEPARTMENT OF BOTANY

Open Elective Paper: Plant Resource Utilization
Semester-II: Paper Code: 16BOTO1

MM. Th 80+IA 20
Time: 3 hrs.

Note: The examiner is required to set even questions in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt Question 1 and four more selecting at-least one from each unit.

UNIT-I

Origin of Agriculture, World Centres of Primary diversity of domesticated plants: Plant Introductions and Secondary Centres.
Botany, Cultivation, Harvesting and uses of Wheat and Rice.
Botany, Cultivation and uses of following fruits and vegetables: Mango, Apple, Banana, Potato, Alliums, Cabbage, Spinach and Tomato

UNIT-II

General Account of the Spices: Ginger, Turmeric, Cinnamon, Clove,
Beverage Plants: Source and general account of Tea and Coffee.
Legumes: Origin, Botany, Cultivation and uses of Pigeon pea, Chick pea, Cluster bean
Medicinal Plants: Plants as sources of drugs, parts used and uses.
Fibres: Types of fibres - Soft fibres, Hard fibres, Surface fibres, Brush fibres and Braiding fibres.

UNIT-III

Gums: Important commercial gums and their uses.
Tannins and Dyes: Sources and their uses.
Vegetable Oils and Fats: Distinction between fatty and essential oils. Drying (Soyabean and linseed), nondrying (Groundnut and Mustard oil) and Semi drying (cottonseed and Sunflower oil) oils and their uses.
Wood and its Uses: Soft woods and hard woods, wood as fuel, construction material
Genetic Resources and their conservation.

SUGGESTED READINGS

1. Anonymous. *National Gene Bank*: Indian Heritage on Plant Genetic resources (Booklet). National Bureau of Plant Genetic Resource, New Delhi. 1997.
2. Cobley, L.S. and W.M. Steels. *An Introduction to the Botany of Tropical Crop*

Plants.3rd Ed. The English Language Book Society and Longman, London. 1979.
3. Bole, P.V. and Y. Vaghani. *Filed Guide to Common Indian Trees.* Oxford University Press, Mumbai. 1991.
4. Chandel, K.P.S., G. Shukla and N. Sharma. *Biodiversity in Medicinal and Aromatic Plants in India: Conservation and Utilization.* National Bureau of Plant Genetic Resources, New Delhi. 1996.
5. Conway, G. and V.W.Rattan. *The Doubly Green Revolution. Food for all in the 21st Century*. Cornell Univ. Press. 1999.
6. Dastur, J.F. *Medicinal Plants of India and Pakistan*.3rd Ed. Meyerbooks. 1985.
7. Hill, A.F. *Economic Botany.* McGraw Hill Book Co. Inc., New York. 1986.
8. Kirtikar, K.R. & D.D. Basu. *Indian Medicinal Plants.* Vols. I & II. 2nd Ed. Lalit Mohan Basu, Allahabad. 1953.
9. Kochhar, S.L. *Economic Botany of the Tropics*.2nd Ed. MacMillan India Ltd., Delhi.
10. Leonard, W.H. & J.H. Martin. *Cereal Crops.* MacMillan Co., New York, USA. 824 pp. 1963.

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

OPEN ELECTIVE COURSE

CYBER FORENSIC AND SECURITY

Paper Code: 16CSAO1

MM. Th 80+IA 20

Time: 3Hrs.

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-1

Introduction to Information Systems: Types of information Systems, Introduction to information security, Need for Information security, Threats to Information Systems, Information Security Investigations.

Security threats - Sources of security threats- Motives - Target Assets and vulnerabilities – Consequences of threats- E-mail threats - Web-threats - Intruders and Hackers, Insider threats, Security Threats to E-Commerce, Cyber-crimes.

UNIT-2

Cyber Forensics: Cyber Security, Cyber Security roles, Cyber Security Principles, Difference between information Security and Cyber Security, Types of Computer Forensics Technology, Types of Military Computer Forensic Technology, Types of Law Enforcement: Computer Forensic Technology, Types of Business Computer Forensic Technology, Specialized Forensics Techniques, Hidden Data and How to Find It, Spyware and Adware, Encryption Methods and Vulnerabilities, Protecting Data from Being Compromised Internet Tracing Methods, Security and Wireless Technologies, Avoiding Pitfalls with Firewalls Biometric Security Systems

UNIT-3

Ethical Hacking: Essential Terminology, Hacking windows – Network hacking – Web hacking – Password hacking, Malware, Scanning, Cracking. Digital Evidence in Criminal Investigations: The Analog and Digital World, Training and Education in digital evidence, Evidence Collection and Data Seizure: Why Collect Evidence, Collection Options Obstacles, Types of Evidence, The Rules of Evidence, Volatile Evidence, General Procedure, Collection and Archiving, Methods of Collection, Artifacts, Collection Steps, Controlling Contamination: The Chain of Custody, Reconstructing the Attack, The digital crime scene, Investigating Cybercrime, Duties Support Functions and Competencies.

UNIT-4

Cyber Crimes and Cyber Security Standards: Crime incident Handling Basics: Cyber activism, Tracking hackers, clues to cyber-crime, privacy act, search warrants, common terms, organizational roles, procedure for responding to incidents, reporting procedures, legal considerations, Information Technology Act 2000: Scope, jurisdiction, offense and

contraventions, powers of police, adjudication, Intellectual property issues in cyberspace, ISO, Copyright Act, Patent Law, Cyber Laws in India.

Reference Books:

1. V.K. Pachghare, "Cryptography and Information Security", PHI Learning Private Limited, India.
2. William Stallings and Lawrie Brown, "Computer Security: Principles and Practice", Prentice Hall.
3. Swiderski, Frank and Syndex, "Threat Modeling", Microsoft Press.
4. John W. Rittinghouse, William M. Hancock, "Cyber Security Operations Handbook", ElsevierPub.
5. Deborah G Johnson, "Computer Ethics", 4th Edition, Pearson Education Publication.
6. Earnest A. Kallman, J.P Grillo, "Ethical Decision making and IT: An Introduction with Cases", McGraw Hill Publication.
7. Dr. Surya Prakash Tripathi, RitendraGoyal, Praveen Kumar Shukla, "Introduction to Information Security and Cyber Law", WilleyDreamtech Press.
8. Kenneth J. Knapp, "Cyber Security and Global Information Assurance: Threat Analysis and Response Solutions", IGI Global.
9. Cahnder, Harish, "Cyber Laws and Its Protection", PHI Learning Private Limited,Delhi,India
10. Michael E. Whitman, Herbert J. Mattord, "Principles of Information Security", Cengage Learning Pub.
11. Charles P. Pfleeger, Shari LawerancePfleeger, "Analysing Computer Security", Pearson Education India.
12. Joseph M Kizza, "Computer Network Security", Springer Verlag.

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OPEN ELECTIVE OFFERED BY THE DEPARTMENT
Of
Defence and Strategic Studies

SEMESTER-II

PAPER CODE-16DSSO1

NATIONAL SECURITY OF INDIA

Maximum Marks: 100

Credits: 3:0:0 **Theory Marks: 80**

Time Allowed: 3 Hours **Internal Assessment Marks: 20**

INSTRUCTION FOR THE PAPER SETTERS

The Paper-Setters/Examiners will have to set Eight Question, selecting two from each out of Unit-I,II, III and IV. And one question consisting of Ten short answer type questions, without it any internal choice covering the entire syllabus be set in Unit V of the question Paper.

The Question Paper will consist of five units: I, II, III, IV and V. Unit-V will be compulsory. The first Four Units will contain two questions each from the respective syllabus and each question will carry 15 marks. Unit V of the question and will contain Ten short answer type question, with any internal choice and will cover the entire syllabus uniformly. Each short answer type question will carry Two marks. The Question Paper should be set strictly according to the syllabus. Separate marks for each question. Should be indicated in the question papers.

UNIT-I

1. **National Security Concepts:-**
   - **a) Definition of National Security, National Defence and National Interest.**
   - **b) Elements of National Security.**

UNIT-II

2. **National Security Structure:-**
   - **a) National Security Council and Cabinet Committee on Security affairs.**
   - **b) Armed Forces, Para-Military Forces.**

UNIT-III

3. Threats to Indian Security:-

a) Internal – Threats

b) External – Threats

UNIT-IV

4. India and Its Neighbours:-

a) India's Geo-Strategic Location

b) India's Relations with its neighbours

Books Recommended

1. Howard, Michael, "Theory and Practice of War"

2. Howard, Michael, "The Causes of War"

3. Bernard Black, L, "War and Its Causes"

4. Wright, Quincy, "A Study of War"

5. Mao-Tse-Tung, "Guerilla Warfare"

6. Legueur Walter, "Guerilla Warfare"

7. Robert E. Osgood, "Limited War – The Challenges to American Strategy".

8. Rees David, "Korea, the limited War"

9. Kitson Frank, "Low Intensity Operations, Subversion Insurgency, Peace keeping"

10. Osanka F.M., "Modern Guerilla Warfare"

11. Nasution, Abdul H., "Fundamentls of Guerilla Warfare"

12. Brodie, Bernard, "Strategy in the Missile Age"

13. Sampooraan Singh, "India and the Nuclear Bomb"

14. Tirpathi, K.S., "Evolution of Nuclear Strategy"

15. **Gupta, Rakesh, "Militarisation of outer-space"**

16. **Encyclopedia Britannica**

17. **Halperin Morton H., "Defence Strategies for the seventies"**

18. **Mir Publications, "Weaponary in Space, The Dilemma of Society"**

MA (Economics)

Semester-II

16ECOO1 - Basics of Economics (Open Elective Paper)

Max. Marks: 100 **Written Exam:80**

Time: 3 Hrs. **Internal Assessment: 20**

Unit -1

What is an Economy? Control problems f an Economy: What, how and for whom to produce, concept of production possibility function and opportunity cost.

Unit-II

Consumer's equilibrium – meaning of utility, marginal utility, conditions of consumer's equilibrium.

Unit-III

Demand, market demand, determinants of demand, demand schedule, price elasticity of demand, factors effecting price elasticity of demand.

Unit-IV

Cost and Revenue: Total cost, Total fixed cost, Total variable cost.
Average cost: Average fixed cost, average variable cost
Revenue- Total revenue and marginal revenue,-meaning their relationship

Note:

(A) Nine questions would be set in all.

(B) Question No. 1 based on the entire syllabus, would be compulsory. It would contain eight short answer questions of two marks each.

(C) There would be two questions (16 marks each) from each of four units.

(D) Candidates would be required to attend five questions (one compulsory and selecting one from each unit).

Reading List:

- D.N. Divedi: Principles of Economics, 2nd Edition, Vikas Publication House.
- R Dutta and K P M Sundaram: Indian Economy, S Chand
  A.N.Agarwal: Indian Economy, Problems of Development and Planning, New Age.
- Mishra and Puri: Indian Economy, Himalaya.

OPEN ELECTIVE - I (FUNDAMENTAL ASPCETS OF EDUCATION)
16EDUO1

Time: 3 Hours **Max. Marks: 100**
Credits: 03 **(Theory: 80, Internal: 20)**

NOTE FOR PAPER SETTER

I Paper setter will set 9 questions in all, out of which student will be required to attempt 5 questions

II Q. No. 1 will be compulsory and will carry 16 marks. It will comprise of 4 short answer type questions of 4 marks each to be selected from the entire syllabus.

III Two long answer type questions will be set from each of four units, out of which the students will be required to attempt one question from each unit. Long answer questions will carry 16 marks each.

IV All questions carry equal marks

COURSE OBJECTIVES:

After completing the course, the students will be able to:

understand nature and functions of education and philosophy and their relationship

explain the meaning, types and scope of educational technology

acquaint the learner with the process of development and assessment and its implication in teaching learning process

develop an understanding of different stages of growth and development.

understand the concept of educational sociology and sociology of education.

acquaint students with the basics of social organization and its concept.

develop an understanding of different factors influencing social organization-folkways, mores, institutions; values.

COURSECONTENTS

UNIT – I

Education and Philosophy

Concept of Education and Philosophy.

Nature of Education and Philosophy.

Relationship of Education and Philosophy.

Need of Philosophical Foundations of Education.

Branches of Philosophy; Metaphysics, Epistemology and Axiology, their implications for Education; Philosophical redirection of educational research in recent times.

UNIT–II

Educational Technology. Meaning, Nature, Approaches, Types, Scope And Significance Of Educational Technology

Programmed Instruction: Concept, Principles and Styles of Programmed Instruction Development of Programmed Instructional Material.

ICT In Education; Computer Assisted Instruction, Computer Managed Learning And Process of development of Computer based instructional material, Web Integrated Learning.

E-Learning and Virtual classrooms.

UNIT-III

Developmental Aspects of the Learner

Educational Psychology: Concept and scope

Concept of Teaching and learning

Role of Educational Psychology in the Teaching –learning process

Concept of Growth and development and principles' of development and its implications to teaching and learning process.

Genetic epistemology of Jean Piaget.

Motivation: Need, types and how can a teacher motivate students for learning.

Factors affecting Learning.

UNIT – IV

Concept of Educational Sociology and Sociology of Education

Social organization and its concepts.

Factor influencing social organization-folkways, mores, institutions; values.

Dynamic characteristics of social organization and its educational implications.

Education as an investment.

Brain drain: Concept, factors responsible for Brain drain, how to check brain drain from our country.

Suggested Readings:

Andrews, T.W. (1961).Methods in Psychology, New York: John Wiley and Sons, Inc.

Baller, Warren R., Don, C.(1962). The Psychology of Human Growth and Development, New York: Holt, Rinehart and Winston.

Banerjee A.C. & Sharma S.R. (1999) : Sociological and Philosophical issues in Education, Jaipur : Book Enclave.

Bhushan, A & Ahuja, M. (1992), Educational Technology, Meerut : Vikas Publication.

Bloom, B.S. (1972), Taxonomy of Educational Objectives. A Hand Book- I (Cognitive Domain), New York: Devid Mokeay Campo.

Chauhan S.S.(1978), A Textbook of Programmed Instruction, New Delhi : Sterling Publishers.

Das, R.C.(1993), Educational Technology: A Basic Text, New Delhi: Sterling Publishers.

Dave, R.H (1969). Taxonomy of educational objectives and achievement testing; development of educational testing vol. 1. London: University of London Press.

Mangal. S.K. (2009). Essentials of Educational Technology. New Delhi: Prentice Hall of India pvt. Ltd.

Sharma, Hemant Lata (2014). Innovative inputs in ICT. Jalandhar: Amit Prakashan.

Sharma, Hemant Lata & Sharma, Savita (2010). Learning to Learn With Love : Theory and Practices of Co-operative Learning, New Delhi : Gagandeep Publication.

Pnadey, K.P.(1983). Perspective in Social Foundation of Education, Amitash Prakashan, Ghaziabad.

Kamat, A.R.,(1985).Education and Social Change in India, Samaiya Publishing Co., Bombay.

Maunheim, K.et al.,(1962). An Introduction to Sociology of Education. Routledge and Kegam Paul,London.

Mossish , Loor., (1972). Sociology of Education: An introduction, George Allen and Unwin, Londo

Walia J.A., (2011): Philosophical, Sociological and Economic Bases of Education, Jalandhar: Ahim Paul Publishers

Semester –II

Open Elective

16ENVO1: Environmental Issues

MM. Th 80+IA 20 Time : 3 Hours.

Note: 1. Seven questions will be set in all.
2. Question No. 1 will be objective covering the entire syllabus & compulsory. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt five in total, Question I and four by selecting at least one from each unit.

Unit-1

Global Environmental Issues: Green House effect – causes and associated hazards, Ozone layer depletion – causes and associated hazards, Deforestation, Human Population Growth. Environmental problems associated with urbanization, industrialization, modernization of agriculture

Unit-2

Regional Environmental Issues: Forest and Wildlife management, desertification, reclamation of degraded land; Human intervention on wetlands, siltation and eutrophication, reclamation of wetlands, Mining and Environment, Open cast mining, Oil exploration and transportation, Deforestation and their impact on environment.

Unit-3

Pollution: Air Pollution : Causes of air pollution, Some important pollutants of air (CO, SO_X, NO_X and HC and Particulates) – their sources and effects on living and non-living organisms. Water Pollution: Sources of pollution of surface and ground water, Types of water pollutants. Solid Waste – Sources, characterization, disposal and management. Soil Pollution sources of soil pollution, Pollution and residual toxicity from the application of insecticides, pesticides and fertilizers; Soil erosion.

List of Recommended Books

1. Fundamentals of Environmental Science: G. S. Dhaliwal, G. S. Sangha and P. K. Raina, Kalyani Publication
2. Environmental Chemistry : A. K. De
3. Environmental Chemistry : B.K. Sharma, and H. Kaur
4. Fundamentals of Ecology : E. P. Odum
5. Environmental Science (6th ed) (1997): Jr. G. T. Miller, Wadsworth Pub. Co.

Food Adulteration

PAPER CODE: 16FTEO1

There will be seven questions in all. The first question will be compulsory and short answer type covering the entire syllabus. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt question 1 and four more selecting atleast one from each unit.

MM. Th 80+IA 20

Time: 3h

Unit I

Basic food groups, Function of foods and its general composition.

Food Quality & Safety, various aspects of food quality & safety, challenges of food safety.

Food adulteration and contamination, common food contaminants & adulterants

Unit II

Food Adulteration: Nature of adulterants, methods of evaluation of food adulterants and toxic constituents in foods, common food adulterants & their detection on various foods like

a) Milk and Milk products
b) Oils and fats
c) Spice and condiments
d) Wheat and other flours
e) Sugar and Preserve
f) Fruit and Vegetable products
g) Beverages Alcoholic and Non-Alcoholic

Unit III

Food Laws and Regulation: Prevention of Food Adulteration Act 1954, Food Safety and Standards Act (2006), Food Safety and Standards Authority of India (FSSAI), BIS, FPO, APEDA.

Recommended Books:

1. Gould, W.A and Gould, R.W. (1998). Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
2. Furia, T.E. Ed. 1980. Regulatory Status of Direct Food Additives. CRC Press, Florida.
3. Rekha S. Singhal , Pushpa R. Kulkarni, Dananesh V. Rege, (1997). Hand Book of Indices of food Quality and Authenticity, wood head Publishing Ltd.
4. Siva Kiran, R.R. (2012). Manual for Detection of Common Food Adulterants, First Edition, IAPEN.
5. Battershal, J.P. (2013). Food Adulteration & its detection, General Books LLC.
6. Prevention of Food Adulteration Act, 4th Edition, Ashoka Law House, 2002

Open Elective Paper (offered by Department of Genetics)

Paper Code: 16GENO1 **Genetics &Society** **Credits: 3**

Internal Assessment Marks: 20

Time: 3 Hrs **Max. Marks: 80**

Instructions

There will be a total of seven questions. Question No. 1 will be compulsory and shall contain eight to ten short answer type questions without any internal choice and it shall cover the entire syllabus. The remaining six questions will include two questions from each unit. The students will be required to attempt one question from each of the four units. The students will attempt four questions in all.

Unit I

Basic principles of inheritance of characters, Chromosomes and genes, pedigree-gathering family history symbols, construction of pedigree ; Consanguinity and its effects; Sex linked anomalies: Haemophilia, Colour blindness; Sex limited and sex influenced traits.Human Health and Disease: Common syndrome according to numerical and structural alteration: Klinefilter, Down's, Turner, Achondroplasia,; Inherited enzyme defects in man: Albinism, Galactosemia; Multifactorial disorders: Diabetes, Schizophrenia, Huntington's disease, Alzheimer's disease; Methods of genetic testing, Prenatal diagnosis, New born screening;DNA fingerprinting:Paternity testing, Individual Identification.

Unit II

GM World: Green revolution, Application r-DNA technology in agriculture: Transgenic crops, Gene gun, GM foods, Ht, Bt and others, Concerns about bio-safety of genetically modified organism (GMO) (Allergen, toxicity, impact on biodiversity etc.); Indian regulatory system for testing of GMOs in laboratory, field trials and commercial release of transgenic ;potential benefits of GMOs.

Unit III

Microbial innovations in pharmaceutical, health, agricultural and industrial sectors; Strategies for selection and improvement of industrial strains of microorganisms;

Stem cell research, Cloning designer babies, Organ banking, Transgenic animals, Creating transgenic animals, In vitro fertilization, Genetic counseling and reproductive decisions, Eugenics;

Role of Genetics for the improvement of Health,Agriculture and environment.

Suggested books:

1 Principles of Genetics by D. Peter Snustad and Michael J Simmons
2 Genes in the Environment- Rosie S. Hails, Wiley-Blackwell Publications
3 The Science of Genetics by Alan G. Atherly, Jack R. Girton, John F. McDonald
4 Principles and branches of Medical Genetics, Emery and Rimoih, Churchill Livingstone, Newyork, Vol-1-3.
5 Industrial Microbiology, G. Reed (editor), CBS Publishers (A VI Publishing Company).
6 Modern Microbial Genetics (2002)-Streips U. N. and Yasbin R.E., Wiley-Liss
7 Plant Biotechnology (2006) - B. D. Singh, Kalyani Publishers
8 Plant Biotechnology-The Genetic Manipulation of Plants (2003) Slater A. Scott N. & Fowler M., Oxford University Press Inc Nigel Jen,
9 Animal Cell Biotechnology:Methods and protocols, Humana Press.
10 Genetics in Medicine 7th Ed (2007) - Thompson and Thompson, Saunders
11 Primose SB, Molecular Biotechnology, Panima, 2001

M.A. Geography Semester-II Session 2016-17 onwards

Open Elective: 16GEOO1

BASICS OF GEOINFORMATICS

Credit: 03 (3+0+0)
End Semester Exam: 80 marks
Internal Assessment: 20 marks
Total: 100 marks Time: 3hrs

Learning Objectives

This course is designed to give students an exposure to basics of geospatial technologies. It offers to learn the techniques of generation and management of earth surface information. An inter and multi disciplinary approach has been used to make subject interesting and useful for students. Latest technology of GPS is included to understand use of modern day navigation and surveying.

Learning Outcomes

Students will be able to learn the use of latest geospatial technology. It will help them to understand the spatial phenomena in a better manner with availability of real time and accurate information. These technologies being modern and interdisciplinary in nature will enable the students to apply this knowledge in various fields of life**.**

Unit – I

Aerial Photography

Aerial photography: history and development, advantages and limitations; Classifications of aerial photographs; Geometry of an aerial photograph; Scale of an aerial photograph; Availability and procurement of aerial photographs in India; Aerial photograph vs map.

Unit – II

Remote Sensing.

Introduction to Remote Sensing; electromagnetic radiation; stages of remote sensing; energy interactions in atmosphere; energy interactions with earth surface features and spectral signatures. Remote Sensing applications in land use/land cover, urban, environment, forest and disaster studies.

Unit – III

Remote Sensing

Remote Sensing platforms: airborne and space borne; satellite orbits: geostationary and near polar; Image data characteristics: resolutions- spatial, spectral, radiometric and temporal; Sensors and their types; Satellite missions of ISRO .

Unit – IV

GIS and GPS

Geographic Information System (GIS): definition and applications; GIS and remote sensing integration; components and elements of GIS; representation of earth surface features in GIS; introduction to Global Positioning System; GPS satellites constellations; GPS segments; Applications of GPS.

Note (i): Open Elective to be chosen from the basket of Open Electives (OEs) provided by the University.

(ii) The question paper will have five units. First four units of question paper will contain two questions from each unit. Candidate(s) are required to attempt one question from each unit. Unit-V shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

Paul Wolf, Bon DeWitt, and Benjamin Wilkinson. Elements of Photogrammetry with Application in GIS. USA: Mc-Graw Hill Education.2014.

Avery, T.E., and G.L. Berlin. Fundamentals of Remote Sensing and Airphoto Interpretation, Macmillan, New York.1992.

Campbell, J.B. Introduction to Remote Sensing, Guilford, New York.1996.

Curran, Paul J. Principles of Remote Sensing, Longman, London & New York. 1985.

Joseph, G. Fundamentals of Remote Sensing, Universities Press Hyderabad. 2005.

Lillisand, T.M. and P. W. Kiefer. Remote Sensing and Image Interpretation, New York. John Wiley & Sons.1986.

Burrough, P.A. and McDonnell, R.A. Principles of Geographic Information System. Oxford: Oxford University Press. 1998.

Chang, Kang-tsung. Introduction to Geographic Information Systems. New Delhi: Tata McGraw-Hill.2006.

Doberstein, Dan. Fundamentals of GPS Receivers: A Hardware Approach. New York: Springer

MA GEOGRAPHY SEMESTER-II SESSION 2016-17 ONWARDS

Open Elective 16GEOO2

GEOGRAPHY OF INDIA: SYSTEMATIC AND REGIONAL

Credit: 03 (3+0+0)
Exam: 80 marks
Internal Assessment: 20 marks
Total: 100 marks
Time: 3 hrs

Learning Objectives

History, geography and culture have comprised to make India into a major force in South Asia. The course provides an insight into different aspects of India's regional vitality towards unity, stability and progress.

Learning Outcomes

The student will get familiarised with the geographic dimensions of India in terms of its political and administrative characteristics; aspects of its regional vitality; and formation of regions.

Unit-I

India: a historical-geographical expression; Size, location, and boundaries; Physical environment; Historical setting.

Unit-II

Unity in diversity of India: Unifying mechanism and divisive streaks; Evolution of the administrative map of India since Independence.

Unit-III

Regional vitality of India; multiculturalism in India; the Indian diaspora; India's cultural landscape.

Unit -IV

Regionalisation schemes of India: Physiographic (S.P. Chatterjee); Climatic (Koeppen and Trewartha); Agricultural (Jasbir Singh and C.B. Mamoria); and Industrial (B.N. Sinha).

Note (i): Open Elective to be chosen from the basket of Open Electives (OEs) provided by the University.

(ii) The question paper will have five units. First four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

1. Ahmad, Aijazuddin. 1999. *Social Geography*. Rawat Publication, New Delhi.

2. Chandna, R.C. 2002. *Geography of Population.* 5th edn. Kalyani Publishers, Delhi.
3. Deshpande, C.D. 1992. *India: A Regional Interpretation,* ICSSR and Northern Book Center, New Delhi.
4. Hussain, M. 2014. *Geography of India.* 5th edn. McGraw Hill Education, New Delhi.
5. Singh, Jagdish. 2003. *India: A Comprehensive Systematic Geography.* Gyanodya Prakashan, Gorakhpur.
6. Spate O.H.K. & A.T.A. Learmonth. 1967. *Geography of India and Pakistan,* Methuen, London.
7. Sukhwal, B. L. 1971. *India: A Political Geography.* Allied Publishers, New Delhi.
8. Tirtha, Ranjit. 2000. *Emerging India.* Rawat Publications, Jaipur.
9. Tiwari, R.C. 1999. *Geography of India.* Prayag Publishers, Allahabad.
10. Wadia, D. N. 1953. *Geology of India.* Macmillan & Co., London.

HISTORY

Paper: **Nationalism In India**
Paper Code: 16HISO1

Max.Marks : 100
Theory : 80
I.A : 20
Time : 3 Hrs.

Note: Nine questions are to be set in all spreading into five units Each of the first four units shall contain two questions from each unit of the syllabus and Unit-V (Q. No. 9) which will be compulsory, shall contain eight short answer type questions (two marks each) covering the entire syllabus. The Candidates shall be asked to attempt five questions in all selecting one question from each unit including compulsory question. All questions shall carry equal marks.

Unit – I

1. Approaches to Indian Nationalism : Conceptual Debates.
2. Emergence of Organized Nationalism.

Unit-II

1. Trends till 1919
2. Gandhian Movements - Nature, Programme, Social Composition, Limitations and Challenges.

Unit-III

1. Revolutionary and Left Movements.
2. Subhash Bose and INA and Telengana.
3. States' Peoples' Movements.

Unit-IV

1. Working of Congress and Non-Congress Provincial Ministries.
2. Communal Politics and Partition.

Suggested Readings :

Desai, A.R.	:	Social Background of Indian Nationalism, Bombay, 1949
Tara Chand	:	History of the Freedom Movement Vol. I, II, III, IV (4 Vols.), Delhi, 1961
Majumdar, R.C.	:	History of Freedom Movement Vol. I, II, III, Calcutta, 1962-63
Chandra Bipan and others	:	Communalism in Modern India, New Delhi, 1987
"	:	Struggle for Independence of Indi, New Delhi, 1987
Dhankhar, Jaiveer S.	:	A Short History of Hindustan Socialist Republic an Association, Delhi, 2001
"	:	Prelude to Pakistan, Delhi, 2000
Mahrotra, S.R.	:	The Emergence of Indian National Congress, Delhi, 1971
Sarkar, S.	:	Modern India 1885-1947, New Delhi, 1983

Note : In addition, students are advised to consult the current Research Journals of History.

FUNDAMENTALS OF MANAGEMENT
Course Code: 16IMSO1

MM: Th 80+IA 20

Time: 3 hours

Course Objective:
The objective of this course is to expose the students to basic concepts of management and to enable them to gain appreciation for emerging ideas, techniques, procedures and practices in the field of management.

Unit -I
Introduction: concept and nature of management; evolution of management thoughts – traditional, behavioural, system and contingency viewpoints

Unit -II
Planning, decision making and organizing: nature and elements of planning, planning types and models; strategic planning – an overview; basic issues in organizing – work specialization, chain of common delegation, decentralization, span of management, bases for departmentation

Unit -III
Leading: recognition of human factor, motivation models/approaches; leadership styles/behaviours, personal characteristics of effective leaders, leadership development

Unit -IV
Management control– concept and process, overview of control techniques, effective control system; evaluating corporate social performance; managing company ethics and social responsibility

Suggested Readings:

1. Robbins, S.P. and Decenzo, D.A. Fundamentals of Management , Pearson Education Asia, New Delhi
2. Hellreigel, Management, Thomson Learning, Bombay
3. Koontz, H and Wechrich, H; Management, Tata McGraw Hill
4. Stoner, J et. al, Management, New Delhi, PHI, New Delhi
5. Robbins & Coulter, Management, PHI, New Delhi
6. Satya Raju, Management – Text & Cases , PHI, New Delhi

1. Richard L. Daft, Management, Thomson South-Western

Instructions for External Examiner: The question paper shall be divided in two sections. **Section 'A'** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section 'B'** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

Journalism and Mass Communication

(Open Elective) [for students of other Dept.)

16JRMO1

MEDIA & SOCIETY

2nd Semester

Marks: 100
Credits: 3:0:0 **Theory Marks: 80**
Time Allowed: 3 Hours **Internal Assessment Marks: 20**

Unit I

1. Media Definition
2. Relationship of Media in Society
3. Impact of Media on society- recent trends
4. Media and Social Development

Unit II

1. Media Literacy
2. Impact of Media on children and youth
3. Media and gender issues
4. Media and Rural Society

Unit III

1. Media and Violence
2. Media and Rising Crime
3. Media and Democracy
4. Media and development of Scientific temperament
5. Media and environmental issues

Unit IV

1. Media accountability

2. Media and Economic development
3. Media and Nation building
4. Popular culture and media

LL.M. THIRD SEMESTER EXAMINATION w.e.f. Session 2017-18

Open Elective (Family Law)

PAPER CODE: 16LAWO1

MM: Th 80+IA 20

Time: 3 hours

NOTE FOR EXAMINER/PAPER SETTER

The question paper of each course will be divided into Five sections, each of the First Four Sections of the Question Paper will contain 2 questions respectively from Unit-1 to Unit-4 of the syllabus. The students will be required to attempt one question from each section. Section 5 of the question paper shall contain 8 short answer type questions of 3 marks each(without any choice) covering the entire syllabus. As such Section 5 will be compulsory. The examiner will be free to set the questions in problem forms based on case law.

NOTE FOR STUDENTS(ON QUESTION PAPER)

Attempt four questions from sections 1 to 4, selecting at least one question from each section. These questions shall carry 14 marks each. Section 5 is compulsory and each question in this section shall carry 3 marks.

UNIT-I

Application of Hindu Law, Sources of Hindu, Schools of Hindu Law, Hindu Joint Family, Features of Mitakshra and Dayabhaga Joint Families, Coparcenary, Classification of Property, Karta of Joint Family, Position, Liabilities and Powers of Karta. Karta's powers of Alienation, Coparcener's Power of Alienation, Coparcener's Right to Challenge Improper Alienation, Alienee's Rights and Remedies

Leading Case: Harihar Prasad V Balmika Prasad AIR 1975 SC 733
K.S. Subhiah Pillai V Commissioner of IT AIR 1999 SC 1220

UNIT-II

The nature and concept of Hindu Marriage, Evolution of the Institution of Marriage, The Hindu Marriage Act, 1955, Essential Conditions for Valid Hindu Marriage, Ceremonies of Marriage, Registration of Hindu Marriages, Remedy of Restitution of Conjugal Rights, Void and Voidable Marriages, Judicial Separation and Divorce, Various Types of Grounds for Divorce and Judicial Separation, Fair Trial Rule, Legitimacy of Children, Jurisdiction, Bars to Matrimonial Remedies, Ancillary Reliefs, Permanent Alimony and Maintenance, Custody etc.

Leading Case: Kailishwati V Ayudhia Parkash AIR 1977 PLR 216
Naveen Kohli V Neelu Kohli, (2006) 4 SCC 558

UNIT-III

The Hindu Succession Act, 1956, Effects of the Hindu (Succession) Amendment, 2005, Rules of Succession to the Property of Hindu Male, Succession to the Property of Hindu Female, Succession to the Mitakshara Coparcener's Interest, General Rules of Succession, Partition, Subject Matter of Partition, Persons who have a Right to Partition & Right to Share, Persons who are entitled to Share, if, Partition takes place, Modes of Partition, How Partition is effected, Partial Partition, Reopening of Partition, Re-Union.

Leading Case: Raghuvamma V Chenchamma AIR 1964 SC 136
Commissioner of Income Tax V Chandersen, AIR 1986 SC 1753

UNIT-IV

The Hindu Minority and Guardianship Act, 1956, Concept of Minority and Guardianship, Natural Guardians and their Powers, Testamentary Guardian: Appointment and Powers, Certified Guardian, Defecto Guardian, Guardian By Affinity, The Hindu Adoption & Maintenance Act, 1956, Nature of Adoption, Essential Conditions for Valid Adoption, Effects of Adoption, Registration of Adoption, Maintenance As Personal Obligation, Maintenance of Dependents, Quantum of Maintenance, Maintenance As a Charge on Property

Leading Cases: G. Appaswami Chettiar V R.Sarangapani AIR 1978 SC 1051
Githa Hariharan V Reserve Bank of India(1999)2 SCC 228

BOOKS RECOMMENDED

Mulla	-	Principles of Hindu Law
Dr. Paras Diwan	-	Modern Hindu Law
Mayne's	-	Hindu Law and Usage
Dr. U.P.D.Kesari	-	Modern Hindu Law
Basant Kumar Sharma	-	Modern Hindu Law

16LISO1: Academic Integrity and Plagiarism

MM: Th 80+IA 20
Time: 3Hrs.

Note
The paper is divided into 4 units. The candidates are required to attempt 5 questions in all selecting 1 question from each unit (out of two internal choices). Question 1 is compulsory consisting of 8 short answer type questions spread over the whole syllabus. All questions carry equal marks.

Objectives

to know about academic integrity;
to identify instances and types of plagiarism;
to get awareness about plagiarism;
to identify "fair use" applications to the use of someone else's materials;
to find information about the correct way to cite a reference;
to begin to develop your personal philosophy on academic integrity;
to be cautious enough to have deterrence strategies of plagiarism.

Outcomes
The course enables the students to get awareness about the nature and practice of academic integrity and its advantages. Further the completion of the course will guide the students and others to have deterrence policies and strategies to get away from plagiarism activities. After completion of the course, the learners will come to know, how citations are made properly. Over all awareness will be developed to maintain academic honesty with practical examples by the trainers.

Unit 1: Academic Integrity

Academic Integrity: meaning, definition and concept
Reasons: Individual reputation, personal integrity, professional competence, status or standing of the institution
Original writings and contribution to society
Writings and Impact: good and original writings bring credibility; good impact factors; writings meant for the readers and society

Unit 2:Plagiarism

Plagiarism basics: meaning, definition and concept
Plagiarism: concept, need and importance, definitions; types
Copyright and fair use
Hoes does it occur: intentional and unintentional; innocence vs. deception

Unit 3:Plagiarism Deterrence

Deterrence: avoidance, awareness
Guidelines: summarizing, paraphrasing, direct quotations, language and vocabulary
Citations: citation basics; citation styles: parenthetical and superscription
Style manuals : Chicago, APA, MLA, Harvard

Unit 4: Measures, initiative and university agencies

Research and Citation policies: formulation of research polices
Regular trainings & awareness; role of librarians; handling online resources
Anti-plagiarized software; Turnitin; I-authenticate; usefulness and limitations

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Suggested Readings

Cvetkovic, Vibiana Bowman & Anderson, Katie Elson (Eds.) (2010). *Stop plagiarism: a guide to understanding and prevention*. New York: Neel-Schuman.

Lampert, Lynn D. (2008). *Combating student plagiarism: an academic librarian's guide.* Oxford: Chandos.

Posner, Richard (2007). *The little book of plagiarism*. New York: Pantheon Books.

Roth, Lorie (1999). Educating the cut-paste generation. *Library Journal, 124*(18), pp.42-44.

Scalon, Patrick (2003). Student online plagiarism: how do we respond? College Teaching, *51*(4): pp. 161-65.

Swain, N.K. Publish or perish: What the Indian policy makers think about it? *University News*, 52.15 (April 14-20, 2014): pp. 23-28.

Open Electives to be offered by Department of Mathematics

Course Code	Title of the Course	Theory Marks	Internal marks	Practical Marks	Credits (L:T:P)
To be offered in 2nd Semester					
16MATO1	Mathematical Techniques and Applications	80	20	--	3:0:0
16MATO2	Parametric and Non-Parametric Tests	80	20	--	3:0:0

16MATO1: Mathematical Techniques and Applications
(To be offered in Even Semester)

Time: 03 Hours
MM. Th 80+IA 20
Time: 2 h
Credits : 3:0:0

Section - I

Idea of Real Number System, Sets, Relations and functions.
Solutions of linear and quadratic equations; Logrithms and Exponents. Trigonometric functions.

Section - II

Concepts of limit, Continuity and Differentiation. Slope of a straight line.
Increasing and Decreasing functions, Maxima and Minima.

Section - III

Integration - Simple techniques including integration by substitution and by parts for algebraic, exponential and logarithmic functions, Definite integrals. Differential Equation- Solution of first order linear differential equation.

Section - IV

Measures of Central Tendency and Dispersion. Linear Correlation and Regression.

Note : The question paper will consist of **five** units. Each of the first four units will contain **two** questions from unit **I , II , III , IV** respectively and the students shall be asked to attempt **one** question from each unit. Unit five will contain **eight to ten** short answer type questions without any internal choice covering the entire syllabus and shall be **compulsory**.

Books Recommended:

1. Maurice, Weir D., Hass J., Frank, Giordano R., Thomas' Calculus, Pearson.
2. Strang, G., Calculus, Wellesley-Cambridge Press.
3. Heinbockel, J.H., Introduction to Calculus, Vol - 1., http://www.math.odu.edu/~jhh/Volume-1.PDF
4. Goon, A.M, Gupta, M.K and Dasgupta, B, Basic Statistics, World Press.
5. Gupta, S.P, Statistical Methods, Sultan Chand & Sons, New Delhi.

16MATO2: Parametric and Non-Parametric Tests

(To be offered in Even Semester)

Time: 03 Hours
MM. Th 80+IA 20
Time: 2 h
Credits : 3:0:0

Section - I

Parameter and Statistic: Sampling distribution of a statistic, standard error and its utility. Tests of significance: Null and alternative hypotheses, Two types of error, Critical region and level of significance, One-tailed and two-tailed tests, Critical values, Procedure for testing of hypothesis.

Unit -II

Large Sample Tests: Tests of significance for single proportion and single mean, for difference of two proportions, two means and two standard deviations, related confidence intervals for population parameters. Chi-square tests for goodness of fit, Test of independence of attributes.

Unit -III

t-test for single mean, difference of means, F-test for equality of two population variances, related confidence intervals. Applications of ANOVA for one-way and two-way classified data.

Unit -IV

Non-parametric tests: Advantages and drawbacks of non-parametric tests over parametric tests, One sample and two sample sign tests, Median test, Wilcoxon-Mann-Whitney test, One sample runs test, Spearman rank correlation test.

Note : The question paper will consist of **five** units. Each of the first four units will contain **two** questions from unit **I , II , III , IV** respectively and the students shall be asked to attempt **one** question from each unit. Unit five will contain **eight to ten** short answer type questions without any internal choice covering the entire syllabus and shall be **compulsory**.

Books Recommended:

1. Mood, A. M., Graybill, F. A. and Boss, D. C., Introduction to Theory of Statistics, McGraw-Hill.
2. Goon, A. M., Gupta, M. K. and Das Gupta, B., Basic Statistics, World Press.
3. Gupta, S.C. and Kapoor, V. K., Fundamentals of Mathematical Statistics, S. Chand Pub., New Delhi.
4. C. R. Kothari, Research methodology, New Age International Publishers.

M.Sc. Medical Biotechnology Semester -II

Course Title: Principles of Medical Biotechnology-I

MM. Th 80 + IA 20 **Course Code: 16MBTO1** **Time: 3h**

NOTE: The examiner is required to set seven questions in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt Question 1 and four more selecting at-least one from each unit.

Theory

Unit -I

Innate and acquired immunity. Nature and Biology of antigens and super antigens. Antibody structure and function. Antigen - antibody interactions, ELISA, RIA, Western blot, Immunoprecipitation, Inflammation- Acute and chronic inflammation, Hypersenstivity. Blood group – ABO and Rh. Haemoglobin – Structure, biosynthesis and catabolism.

Unit -II

Different types of anaemia and their causes (Deficiency of iron, B12 and folic acid, hemolytic, aplastic and genetic disorders). Homeostasis – factors, mechanism, anticoagulants, procoagulants. Host microbe interactions, entry of pathogens, growth and multiplication of the pathogens, Endotoxins, Collection and transport of specimens for diagnosis

Unit -III

Methods of antimicrobial activity determination, types of epidemiology, tools of epidemiology, Recognition of an infectious disease in a population, types of epidemics, control of epidemics. General properties of viruses, viral multiplication, viral hemagglutination, Cultivation of viruses, Classification and nomenclature of viruses, host response to virus infection

Recommended Books

1. John E. Hall, Medical Physiology by Guyton, Saunders, 12th edition
2. Mims' Medical Microbiology By (author) Richard Goering, By (author) Hazel Dockrell, By (author) Mark Zuckerman, By (author)Ivan M. Roitt, By (author) Peter L. Chiodini Saunders (W.B.) Co Ltd.
3. Benjamin E. (1996), Immunology - A short course 3rd Edition, John Wiley, New York
4. Kuby J. (1997), Immunology, 3rd Edition, W.H. Freeman & Co., New York
5. Roitt, I.M. (1997), Essential Immunology, 9th Edition, Oxford Black Well Science, London
6. Tizard I.R. (1995), Immunology - An introduction, 4th Edition, Philadephia Sauders College press.

(SEMESTER-II)

Open Elective: 16MCBO1: Microbial World: Diversity and applications ***Time:***
03 Hours
MM. Th 80+IA 20
Time: 2 h
Credits : 3:0:0

Note: The question paper will consist of 9 questions. Students will have to attempt 5 questions in total - Question no. 1 will comprise of short answer questions covering the entire syllabus and will be compulsory. Two questions to be set from each Unit and students will have to attempt one from each Unit.

Unit – I

Systematics&Biodiversity:Classification and nomenclature of microorganism.Salient featuresof different groups: Acellularmicroorganisms (Viruses,Viroids, Prions) and Cellular microorganisms (Bacteria, Algae, Fungi andProtozoa) in reference to their distribution and occurrence, morphology, mode ofreproduction and economic importance.

Unit – II

Characteristics of extremophiles:Thermophiles, Methanophiles, Alkalophiles, Acidophiles, Halophiles and Barophiles: Classification, habitats, ecological aspects andapplications.

Unit – III

Microbiological techniques:Preparation of culture media, Pure culture isolation; cultivation,maintenance and preservation/stocking of pure cultures; cultivation of anaerobicbacteria, and accessing non-culturable bacteria. Physical and Chemical methods for the control of microorganisms

Unit – IV

Scope of Microbiology:Role of microorganisms in Food industry, Pharmaceutical industry, Production ofIndustrial enzymes, Agriculture: bio-fertilizers, bio-pesticides. Environment:bioremediation, bioleaching

Suggested readings:

1. Brock TD., Milestones in Microbiology, Infinity Books.
2. Pelczar M.J., Chan E.C.S. & Kreig N.R., Microbiology: Concepts and Application.,Tata McGraw Hill.
3. Stainier RY, Ingraham JL, Wheelis ML & Painter PR General Microbiology, Publisher: MacMillan.
4. Madigan M.T., Martinko J.M. and Parker J., Brock Biology of Microorganisms: Prentice-Hall , Inc USA.
5. Atlas R.M., Principles of Microbiology, Wm C. Brown Publishers.
6. Vandenmark P.V. and Batzing B.L., The Microbes – An Introduction to their nature and Importance: Benjamin Cummings. Microbiology

M.Sc. Physics Semester II

Open Elective – I Sources of Energy – I

PAPER CODE: 16PHYO1

Theory Marks: 80
Internal Assessment: 20
Time: 3 hours

Unit I

Introduction

Limitation of conventional energy sources, need and growth of alternative energy sources, basic scheme and application of direct energy conservation.

Solar Cells:

Solar energy: Introduction, The characteristics of the sun, Definitions related to solar radiations, solar radiation geometry, Estimation of daily solar radiation. Theory of solar cells. Solar cell materials, solar drying, solar furnaces, Solar cooking, solar green house technology, solar thermal power generation, solar cell array.

Unit II

Solar Thermal Energy:

Solar radiations, flat plate collectors and their materials, applications and performance, focusing of collectors and their materials, applications and performance; solar thermal power plants, thermal energy storage for solar heating and cooling, limitations.

Unit III

Geothermal Energy:

Resources of geothermal energy, thermodynamics of geo-thermal energy conversion-electrical conversion, non-electrical conversion, environmental consideration, estimates of geothermal power, nature of geothermal fields, advantages & disadvantages of geothermal energy forms, applications of geothermal energy. Geothermal power plant.

Fuel Cells:

Principle, working of various types of fuel cells, performance and limitations.

Unit IV

Wind Energy:

Wind power and its sources: Principle of working of Wind Energy, performance and limitations of energy conversion systems. Site selection, criteria, momentum theory, wind characteristics.

Text / References Books:

1. John Twideu and Tony Weir, "Renewal Energy Resources" BSP Publications, 2006
2. M.V.R. Koteswara Rao, "Energy Resources: Conventional & Non-Conventional" BSP Publications, 2006.
3. D.S. Chauhan, "Non-Conventional Energy Resources" New Age International.
4. C.S. Solanki, "Renewal Energy Technologies: A Practical Guide for Beginners" PHI Learning.
5. Peter Auer, "Advances in energy system and Technology" Vol I & II Edited by Academic Press.
6. G.D. Rai, "Non-conventional Energy sources" Khanna Publishers
7. Raja A.K., "Introduction to Non-Conventional Energy Resources" Scitech Publications.

Fahrenbruch and Bube, "Fundamentals of Solar cells. Photovoltaic Solar Energy"

SYLLABUS : M.A.(P) Sem-II Open Elective

Paper Code- 16PUBO1

Administrative Literacy

Total Credit: 4+0+0 =4
L+T+P
Total Marks = 100
Semester End Exam = 80
Internal Assessment = 20
Time = 3 hrs.

Note:

The question paper will consist of 5 units containing 9 questions. The students are required to attempt one question from each unit. Question no 9 consisting of eight short answer questions covering entire syllabus, is compulsory.

Unit-I

Administrative Structure at Central Level – Office of President, Prime Minister's Office, Cabinet Secretariat & Central Secretariat

Unit-II

Administrative Structure at State Level – Office of Governor, Chief Minister's Office, State Secretariat & Chief Secretary

Unit-III

Administrative Structure at Division & District Level: Divisional Commissioner, Deputy Commissioner, Superintendent of Police, District Rural Development Agency, Haryana Urban Development Authority, District Development & Panchayat Officer

Unit-IV

Flagship Programmes of Central Government: Mahatma Gandhi National Rural Employment Guarantee Scheme, Rashtriya Swasthya Bima Yojana, Pradhan Mantri Kaushal Vikas Yojana, Mid-day Meal, Integrated Community Development Scheme,Targeted Public Distribution System.

Suggested Readings:

1. Maheshwari, S.R., Evolution of Indian Administration, New Delhi: Orient Longman, 1974.
2. Maheshwari, S.R., Indian Administration, New Delhi: Orient Longman.
3. Arora, R.K. and Rajni Goyal, Indian Public Administration, New Delhi: Wishwa, 1997..

4. Misra, B.B., The Central Administration of East India Company, London: Manchester Press, 1959..
5. Sarkar, J.N., Mughal Administration, Calcutta: M.C. Sarkar, 1935.
6. Ray, Anirudh , Some Aspects of Mughal Administration, New Delhi: Kalyani 1984.
7. Khosla, R.P., Administrative Structure of the Great Mughals, Delhi: Kanti Publications, 1991.
8. Prasad K. Nayak, S. Sen and G.S. Mansukhani (Eds.), Indian Administration, New Delhi: Unique Publishers, 2007
9. Fadia, B.L., Indian Administration, Agra: Sahitya Bhawan, 2007.
10. Chand Ashok, Indian Administration, London: Allen and Unvin, 1967.
11. Singh Hoshiar, Indian Administration Allahabad: Kitab Mahal, 1998.
12 Kataria, Surender , Indian Administration, Jaipur: RSBA
13 Maheshwari, S.R., State Governments in India, New Delhi: Macmillan, 2000.
14 Padhi, A .P. State Administration in India, Delhi: Uppal, 1998.
15 Sharma, Ashok, Bharat Mein Prashashnik Sansthan, Jaipur: RSBA, 2003.
16 Arora, Ramesh and Geeta Chaturvedi, Bharat Mein Rajya Prashashan, Jaipur, RSBA, 2001
17 Sharma, Harish Chander, State Administration in India (Hindi) Haipur: College Book Deport, 2002.

M.A. Political Science
Semester II
(16POLO1)

Paper: Disaster Management-I (Open Elective A)

Max. Marks : 100

Theory Paper : 80
Internal Assessment : 20
Time : 3 Hrs

Note:

The question paper will be divided into five units carrying equal marks i.e. 16 marks. Students shall be asked to attempt one out of two questions from each unit. Unit five shall contain eight short answer type questions without any internal choice and it shall be covering the entire syllabus. As such, all questions in unit five shall be compulsory.

UNIT I

Disaster Management: Meaning, Concepts, Principles, Scope, Objectives and Approaches
Elements of Disaster Management

UNIT II

Disaster Mitigation: Hazard Assessment, Vulnerability Assessment, Risk Assessment, Protective Measures and Public Information

Disaster Preparedness: Disaster Plan, Damage Inspection, repair and Recovery procedures, Communication and Control Centers, Disaster Forecasting, Warning and Prediction

UNIT III

Disaster Relief: Rapid Damage As operations, Evacuation and Shelter, Media Coverage, Relief Aid, Maintain

UNIT IV

Reconstruction Planning: Meaning an Economic and Social Rehabilitation

Essential Readings:

1. Beatley, Timothy (1998). *The Vision Burby, Raymond (ed.)*, *Cooperating wi Hazards with Land-Use Planning*
   Washington, D.C., Joseph Henry Press.
2. David Godschalk, Timothy Beatley, Phil J. Kaiser (1998).
   Natural Hazard Mitigation: Recasting
   Island Press.
3. *FEMA* (2000). Planning for a Sustain Hazard Mitigation and Livability. *Washin*
4. *Godschalk, David R., Timothy Beatley, P Edward J. Kaiser*

SYLLABUS FOR OPEN ELECTIVE (SANSKRIT)

Ancient Indian Culture and Philosophy

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laalaaLd``f`fr ,oaaaa
n”kZZZZu½
16SKTO1
2nd Semester

Maximum Marks: 100

Credits: 3:0:0 **Theory Marks: 80**
Time Allowed: 3 Hours **Internal Assessment Marks: 20**

Unit I : General Study of Ramayana and Mahabharta - 20

?kVd ,d ¼jkek;.k o egkHkkjr dk lkekU; v/;;u½

(i) General Introduction ¼lkekU; ifjp;½

(ii) Recenssions ¼laLdj.k½

(iii) Society ¼lekt½

(iv) Family Relations ¼ikfjokfjd lEcU/k½

(v) Education ¼f”k{kk½

(vi) Politics ¼jktuhfr½

(vii) Economy ¼vFkZO;oLFkk½

(viii) Situation of Women ¼fL=;ksa dh n”kk½

Unit II : Vidurniti - 20

?kVd nks % ¼fonqjuhfr½

Unit III :Śrimadbhagavad Gītā – Chapters I to III - 20

?kVd rhu Jhen~Hkxon~xhrk % v/;k; & ,d ls rhu

Unit IV : Yoga Philosophy - 20

?kVd pkj ;ksx n”kZu

(i) General Introduction to Yoga – Citta, Vrtti, Iśvara

;ksx n”kZu dk lkekU; ifjp; & fpÙk] o`fÙk] bZ”oj

(ii) Yoga for Social Health – Maitri, Karunā, Muditā, Upekshā, Yama

;ksx ,oa lkekftd LokLFk; & eS=h] d#.kk] eqfnrk] mis{kk] ;e

(iii) Yoga for physical health – Niyama, Āsana, Prānāyāma
;ksx ,oa “kkjhfjd LokLF; & fu;e] vklu] izk.kk;ke

(iv) Yoga for mental health – Pratyāhāra, dhāranā, dhyāna, samādhi.

;ksx ,oa ekufld LokLF; & izR;kgkj] /kkj.kk] /;ku] lekf/k

Guidelines : Students will be required to attempt five questions of 16 marks each.

Question no. 1 will comprise eight short answer type questions from all Units. Guidelines for other Four questions are as under.

fn”kk funZssZšZZs”k &

Unit I : One critical question out of two

Or

two short notes out of four. 16

Unit II : One critical question out of two

Or

two short notes out of four. 16

Unit III : One critical question out of two

Or

two short notes out of four. 16

Unit IV : One critical question out of two

Or

two short notes out of four. 16

Recommended Books (vuq”kaflr xzUFk) :

1. jkek;.k & xhrk izsl xksj[kiqj

2. egkHkkjr & xhrk izsl] xksj[kiqj

3. Srimad Valmikiya Ramayana with Commentaries in 6 Vols. Hkkjrh; fo|k izdk”ku] tokgj uxj]

fnYyh & 7

4. Srimad Mahabharatam Ed. by T.R. Krishnacharya – Indian Book Centre, Sri Satguru Publications, 24/4, Shakti Nagar, Delhi.

5. Valmiki Ramayana me Varnit Arthik Jeevan – Kaveri Book Service

6. Valmiki Ka Rajdharma – Kaveri Book Service

7. Jhjke ds ;qx dk frfFk fu/kkZj.k % iq’dj hyky cukjlh nkl] fnYyh HkVukxj] ek

8. Politics and Ethics in Ancient India (As depicted in Mahabharta) : M. Jauhari – Hkkjrh; fo|k izdk”ku] tokgj uxj] fnYyh

9. Religion and Society in Ancient India : Om Parkash - Hkkjrh; fo|k izdk”ku] tokgj uxj] fnYyh

10. jkek;.kdkyhu lekt ,oa laLd`fr % txnh”k pUnz HkV~V & Hkkjrh; fo|k izdk”ku] tokgj uxj]

fnYyh

11. Vidurniti by Swami Jagdishwaranand – Kaveri Book Service

12. Jhen~Hkxon~xhrk & xhrk izsl] xksj[kiqj

13. A Bhagavad Gita : Kappuswami – pkS[kEck vkfj;.Vkfy;k] fnYyh

14. lw=e~ ¼O;klHkk’;e~½ & O;kŒ czãyhueqfu ikr×ty;kx

15. lw=e~ & O;kŒ lqjs”kpUnz JhokLrO; ikr×ty;kx

16. lw=e~ & O;kŒ gfjgjkuUn vkj.; ikr×ty;kx

17. dh n`f’V esa n”kZu & foeyk d.kkZVd O;k[;kdkjkas ikr×ty;kx

18. The Yoga System of Patanjali – J.H. Woods.

19. Essence of Yoga – Reflections on the Yoga Sutras of Patanjali by Bernard Bauan Chand – Indian Book Centre, Sri Satguru Publications, Delhi.

20. Meditative Yoga : Integrating Body, Breath and Mind by Are Holen and Terbojrn Hobbel : Motilal Banarsidass, Delhi.

21. The Art and Science of Raja Yoga by J. Donald Walters : Motilal Banarsidass, Delhi.

MA 2nd Semester (Open Elective Paper) to be chosen from the common pool of the University.

Sem.	Paper No	Code	Nomenclature of Paper	Contact hours/L+T+P	Marks			Credit
					Theory	I.A	Total	
II	Paper	16SOCO1	Understanding Sociology	4:0:0	80	20	100	3

Scheme of Examination:

It is decided to adopt the new scheme of Choice Based Credit System of examination whereby all the papers have four units comprising of 80 marks and the Internal Assessment component will be of 20 marks in all the Semesters. In the theory paper students will be asked to attempt four questions from the four units selecting at least one question from each unit and the 5th question shall be compulsory which will cover all units in the format of short answer type questions comprising of about 50 to 60 words. Thus, the total marks for all the five questions i.e. four from the units (16x4=64) and the 5th compulsory question of short answer numbering eight of 2 marks each i.e (8x2=16) thus making the total weight age to 80 marks. The detail of Internal Assessment of 20 marks has been prescribed by the University is given below:-

(a) One Class Test : 10 Marks
(b) One Assignment : 5 Marks
(c) Attendance : 5 Marks

Less than 65%	:	0 Marks
Up to 70%	:	2 Marks
Up to 75%	:	3 Marks
Up to 80%	:	4 Marks
Above 80%	:	5 Marks

M.A.(Sociology)
Semester-II
Open Elective Paper- -16SOCO1
Understanding Sociology

Maximum Marks: 100
Theory: 80
Internal Assessment: 20
Time : 3 Hours

Note:

3. **Nine question would be set in all.**
4. **Question No. fifth shall be based on the entire syllabus and would be compulsory. It would contain eight short answer questions of two marks each.**
5. **There would be two questions (16 marks each) from each of the four units.**
6. **The candidate would be required to attempt four questions (one compulsory and other four questions selecting one from each unit).**

Unit-I

Sociology: Meaning and Definition, Beginning and Growth of Sociology; The Scope of Sociology; Relationship with History, Anthropology, Economics.

Unit-II

Society: Types of society; Community and its characteristics; Social Groups and their types; Social Control: Functions and forms.

Unit-III

Social Stratification: Its characteristics and Bases; Social Mobility: Meaning and its types, Socialization: Stages and agencies of socialization; Social Change: Meaning and factors.

Unit-IV

Family: concept, forms and changing pattern of families; Marriage: concept and forms; Kinship: terminology, usages and incest.

References:

MacIver, R.M. and C.H.Page (1985), ***Society***, New Delhi: Macmillan.
Giddens, Anthony, (1993), ***Sociology***. Cambridge: Polity Press.
Spencer, Metta (1976), ***Foundations of Modern Sociolog***y, New Jersey: Prentice-Hall
Johnson, H.M. (1983), ***Sociology: A Systematic Introduction***, New Delhi: Allied Publishers.
Haralambos, M. (1989), ***Sociology: Themes and Perspectives***, New Delhi: Oxford University
Press. Fichter, Joseph H. (1957), ***Sociology***, Chicago: The University of Chicago Press.
Bottomore, T.B. (1972), ***Sociology***, New York: Vintage Books.
Davis, K. (1949), ***Human Society***, New York: Macmillan.
Moore, Wilbert E. (1974), ***Social Change***, Englewood Cliffs: Prentice –Hall.
Rawat, H.K. (2013), ***Contemporary Sociology***, Jaipur: Rawat Publications. Singh,
J.P. (1999), ***Sociology: Concepts and Theories***, New Delhi: Prentice-Hall.

Quantitative Techniques **Paper Code: 16STAO1**
(2nd Semester)

Maximum Marks-80
Internal Assessment Marks—20
Time:-03 Hours
Credit: 03

Section –I

Classification of Data, variable and measurement scales. Presentation of Data. Measures of Central Tendancy and Dispersion, Skewness and Kurtosis. Measures of Association of Attributes. Correlation and Regression. Principle of Least Squares , Multiple and Partial correlation. Fitting of Polynomial and Exponential Curves.

Section –II

Random variables. Probability mass function, Probability density function and Commulative distribution function. Expectation and its properties. Moments, moment generating function and probability generating function. Discrete Probability distributions: Bernolli, Bionomial, Poisson, Negative Binomial, Geometric and Uniform. Continuous Probability distributions: Normal, Exponential, Log Normal and Uniform, Fitting of Bionomial, Poisson and normal distribution.

Section –III

Index numbers: Types, uses and their construction. Cost of living index numbers. Test of adequacy of Index numbers.

Time Series: Components and Models of time series. Measurements of trend and seasonal indices, Forcasting and Estimation.

Section –IV

Statistical Quality Control. Purposes and construction of control charts for variables and attributes using 3 sigma limits and 6 sigma limits. Single and double Sampling Inspection plans. Natural tolerance limit and modified control limits.

Vital statistics: Methods of obtaining Demographic data, Measurement of Mortality and Fertility. Complete Life and Abridged Life Tables.

Books Recommended

1. Goon, A.M., Gupta, M.K. and Dasgupta, B. : Outline of Statistics Volume-I & II
2. Goon, A.M., Gupta, M.K. and Dasgupta, B. : Fundamental of Statistics Volume-I &II
3. Rohtagi, V. K. and Md. Ehsanes Saleh, A. K. : An Introduction to Probability and Statistics
4. Mood, A.M., Graybill, F.A. and Boes, D.C. : An Introduction to Theory of Statistics
5. Croxton, F.E. and Cowden, D.J. : Applied General Statistics
6. Kendall S.M. and Stuart A. : The Advanced Theory of Statistics

Note: The examiner is to set the question paper into five units- A, B, C, D & E. In each unit A, B, C & D, he/she has to set two questions of 16 marks each from section I, II, III, & IV respectively and the candidate will attempt one question from each unit. In unit E, there will be 8 short answered questions of 2 marks each, covering the whole syllabus and the candidate has to attempt all the questions.

Sampling and Estimation Techniques

PAPER CODE: 16STAO2

Maximum Marks-80
Internal Assessment Marks—20
Time:-03 Hours
Credit: 03

Section –I

Population, sample, sampling distribution, standard error. Testing of Hypotheses: Simple and composite hypotheses, Null and alternative hypotheses, two types of errors, critical region and level of significance, one tailed test, two tailed test, Test of significance (Single and two samples problems) for normally distributed data. Goodness of fit test.

Section –II

Sample versus Complete Enumeration. Designing of Sample Surveys, Sources of Errors in Sample Surveys, Types of Non-Response Errors.

Probability and Non-probability Sampling: Simple Random Sampling with and without replacement for the estimation of Mean and Total, Determination of Sample Sizes of specified precision.

Section –III

Stratified Sampling: Proportional and Optimum Allocation, Estimation of gain due to stratification, Construction of strata, Determination of number of strata. Systematic, Cluster and Probability Proportional to Size Sampling. Comparison of stratified sampling with simple random sampling.

Section –IV

Analysis of Variance: one- way, two -way (with one and multiple but equal number of observations per cell). Completely Randomized Designs, Randomized Block Designs and Latin Square Designs.

Factorial Experiments: Definition, Estimation of factor's effect, Analysis of the factorial experiments, Confounding: complete and partial confounding.

Books Recommended

1. Mood A.M., Graybill, F.A. & Boes, D.C. : Introduction to the Theory of Statistics
2. Goon, A.M., Gupta, M.K. and Dasgupta, B. : Fundamental of Statistics, Vol-II
3. Singh D. & Chaudhary F.S. : Theory & Analysis of Sample Survey Designs
4. Mukhopadhyay, Primal : Theory and Methods of Survey sampling
5. Dass, M.N. and Giri, N.C : Design and Analysis of Experiments

Note: The examiner is to set the question paper into five units- A, B, C, D & E. In each unit A, B, C & D, he/she has to set two questions of 16 marks each from section I, II, III, & IV respectively and the candidate will attempt one question from each unit. In unit E, there will be 8 short answered questions of 2 marks each, covering the whole syllabus and the candidate has to attempt all the questions.

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M.D.UNIVERSITY, ROHTAK

16CSEO1 Computer Science Principles
(Open Elective)

MM:T80+IA20
Credit 3
Time: 3 Hr

Instructions for setting of paper: Nine questions are to be set in total. First question will be short answer question covering whole syllabus and will be compulsory to attempt. Next eight questions will comprise of two questions each from the four sections. Student will be required to attempt four more questions selecting one from each section. Each question will be of 20 marks

UNIT I

Fundamental of computer science and computational thinking: logical reasoning, problem solving, data representation, processing of data, abstraction, managing complexity, operation of computers and networks, effective Web searching, ethical, legal and social aspects of information technology.

UNIT II

HTML and XTML basics- LIST – unordered list – nested and ordered list – Basic HTML Tables – Intermediate HTML table and Formatting – basic HTML Forms and Formatting – More Complex HTML Forms – Frameset Element – Nested Frameset. Style Sheets and Graphics: Introduction to Style sheets – Formatting Text by Using Style Sheets – Formatting Paragraphs by Using Style Sheets, Java Script Basics.

UNIT III

Data Mining: Introduction: Motivation, Importance, Knowledge Discovery Process, KDD and Data Mining, Data Mining vs. Query Tools, Kind of Data mining, kind of data, Functionalities, interesting patterns, Classification of data mining systems, Major issues, from Data warehousing to data Mining.

UNIT IV

Computer Networks: Network fundamentals: Local Area Networks (LAN), Metropolitan Area Networks (MAN), Wide Area Networks (WAN), Wireless Networks, Inter Networks.
Reference Models: The OSI model, TCP/IP model.
Operating Systems: Main functions of operating systems. Multi Prograrnming, multiprocessing, and multitasking. Deadlock and CPU scheduling algorithms

TEXT BOOKS

1. Blown To Bits: Your Life, Liberty and Happiness After The Digital Explosion
by Hal Abelson, Ken Leeden and Harry Lewis, 2010
2. Thomas A. Powell, McGraw-Hill “HTML & CSS: The Complete Reference”, Fifth Edition (Complete Reference Series) Osborne Media; 5 edition, 2010.
3.Krzysztof J. Cios, Witold Pedrycz, Roman W. Swiniarski, “Data mining: a knowledge discovery approach”, Springer, 2007

16CSEO2 **Software Engineering Practices**
(Open Elective)

MM:T80+IA20
Credit 3
Time: 3 Hr

Instructions for setting of paper: Nine questions are to be set in total. First question will be short answer question covering whole syllabus and will be compulsory to attempt. Next eight questions will comprise of two questions each from the four sections. Student will be required to attempt four more questions selecting one from each section. Each question will be of 20 marks

UNIT I

Software Engineering-Software Process- Generic process model-Prescriptive process model-specialized, unified process-Agile development-Agile Process- Extreme Programming- Other agile Process models-Software engineering Knowledge-core Principles-Principles that guide each framework Activity,

UNIT-II

Requirements Engineering-Establishing the Groundwork-Eliciting Requirements-Developing use cases- Building the requirements model- Negotiating, validating Requirements- Requirements Analysis- Requirements Modeling Strategies.

UNIT III

Design Process- Design concepts: Abstraction, Architecture, patterns, Separation of Concerns, Modularity, Information Hiding, Functional Independence, Refinement, Aspects, Refactoring, Object Oriented Design Concepts, Design Classes- Design Model: Data, Architectural, Interface, Component, Deployment Level Design Elements, Software Quality-Software Quality Dilemma- Achieving Software Quality .

UNIT IV

Testing: Strategic Approach to software Testing- Strategic Issues- Testing: Strategies for Conventional Software, Object oriented software, Web Apps-Validating Testing- System Testing- Art of Debugging, Software Maintenance-Software Supportability- Reengineering-Business Process Reengineering- Software Reengineering- Reverse Engineering-Restructuring- Forward Engineering- Economics of Reengineering

TEXT BOOKS

1. Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, seventh edition, 2010.
2. Ian sommerville, “Software Engineering” Pearson Edu, 9th edition, 2010.
3. Hans Van Vliet “Software Engineering: Principles and Practices”, 2008.

16MBTO1 **Business skills for Biotechnologists**
(Open Elective)

MM:T80+IA20
Credit 3
Time: 3 Hr

Instructions for setting of paper: Nine questions are to be set in total. First question will be short answer question covering whole syllabus and will be compulsory to attempt. Next eight questions will comprise of two questions each from the four sections. Student will be required to attempt four more questions selecting one from each section. Each question will be of 20 marks

Unit - I

Introduction: Creativity & Entrepreneurial personality and Entrepreneurship in Biotechnology, Concept and theories of Entrepreneurship, Entrepreneurial traits and motivation, Nature and importance of Entrepreneurs, Government schemes for commercialization of technology (e.g. Biotech Consortium)

Unit - II

Project management: Search for a business idea, concept of project and classification, project identification, project formulation, project design and network analysis, project report, project appraisal.

Unit - III

Financial analysis: Ratio analysis, Investment process, Break even analysis, Profitability analysis, Budget and planning process.
Sources of finance: Source of development finance, Project financing, Institutional financing to Entrepreneurs, Financial institutions, Role of consultancy organizations.

Unit - IV

Marketing channels: Methods of marketing, marketing channels, Marketing institutions and assistance.
Biotech enterprises: Setting up Small, Medium & Large scale industry, Quality control in Biotech industries, Location of an enterprise, steps for starting a small industry, incentives and subsidies, exploring export possibilities.

Text/References:

1. Innovation and entrepreneurship in biotechnology: Concepts, theories & cases by D. Hyne & John Kapeleris, 2006.
2. The Business of Biotechnology: From the Bench of the Street: By Richard Dana Ono Published Butterworth- Heinemann, 1991.
3. Entrepreneurship in Biotechnology: Managing for growth from start-up By Martin Grossmann, 2003.
4. Best Practices in Biotechnology Education: By Yali Friedman, Published by Logos Press,2008.
5. Plant Development and Biotechnology: by Robert Nicholas Trigiano, Dennis John Gray; Published by CRC Press, 2004,
6. Dynamics of Entrepreneurial Development and Management, Vasant Desai, Himalaya Publishing House, 2005.
7. Projects: Planning Analysis, Selection, Implemantation & Review, Prasannan
8. Chandra, Tata Mc Graw-Hill Publishing Co.

16MMEO1 OPERATIONS RESEARCH

MM:T80+IA20

Credit 3

Time: 3 Hr

Instructions for setting of paper: Nine questions are to be set in total. First question will be short answer question covering whole syllabus and will be compulsory to attempt. Next eight questions will comprise of two questions each from the four sections. Student will be required to attempt four more questions selecting one from each section. Each question will be of 20 marks

Unit I

Introduction : Definition, role of operations research in decisionmaking, applications in industry. Concept on O.R.model building - Types & methods. Linear Programming (LP) : Programing definition, formulation, solution - graphical simplex Gauss Jordan reduction process in simplex methods, BIG-M methods computational, problem.

Unit II

Deterministic Model : Transportation model-balanced & unbalanced; orth west rule, Vogel's Method, Least cost or matrix minimal, Stepperg stone method, MODI methods, degeneracy, assignment, travelling salesman, problem.

Advanced Topic of LP : Duality, PRIMAL-DUAL, reactions-its solution, shadow price, economic interpretation, dual simplex, post-optimality & sensitivity analysis, problems.

Unit III

Waiting Line Models : Introduction, queue parameters, M/M/1 queue, performance of queuing systems, applications in indutries, problems. Unit VI Project Line Models : Network diagram, event activity, defects in network, PERT & CPM, float in network, variance and probability of completion time, project cost-direct, indirect, total optimal project cost by crashing of network, resources leveling in project problems. Coupling Principal Coordinates, Free Vibrations in Terms of Initial Conditions, Forced Harmonic Vibrations, Vibrations Absorber, Centrifugal Vibration Absorber, Vibration Damper.

Unit IV

Multi degrees of Freedom systems and Numerical Methods: Introduction Influence Coefficients, Stiffness Matrix, Flexibility Matrix, Naural frequancies and Normal Modes, Orthpgonality of Normal Modes, Dunkerley's Equation,Method of Matrix Iteration, The Holzer Type Problem Geared and Branched Systems, Beams.

Normal Mode Vibrations of Continuous System : Vibrating String, Longitudinal Vibrations of Rod, Torsional Vibrations of Rod, Lateral Vibrations of Beam.

Text Books :- 1. Theory of Vibration with Aplications W.T. Thomson, Prentice Hall of India.

2. Mechanical Vibration : G.K. Grover and S.P. Nigam, Nem Chand and Sons.

References Books : 1. Theory and Practice of Mecahnical Vibrations J.S. Rao and K. Gupta , Wiley Eastern Ltd.

2. Mecahnical Vibrations S.S. Raop, Addision - Wesley Publishing Company.

OPEN ELECTIVE COURSE

16ECEO1 MULTIMEDIA COMMUNICATION

MM:T80+IA20
Credit 3
Time: 3 Hr

Instructions for setting of paper: Nine questions are to be set in total. First question will be short answer question covering whole syllabus and will be compulsory to attempt. Next eight questions will comprise of two questions each from the four sections. Student will be required to attempt four more questions selecting one from each section. Each question will be of 20 marks

UNIT I

Multimedia & Information Representation Multimedia Introduction: multimedia networks, Telephone networks, Data networks, Broadcast television networks, Integrated services digital networks, Broadband multiservice networks, types of Multimedia Applications: Movie on Demand, Near Movie on Demand, communication modes, multipoint conferencing, network QOS, Application QOS. Multimedia Information Representation: Digitization principles, Encoder Design, Decoder Design, Unformatted Text, Formatted Text, Hypertext, Images: Graphics, Digitized documents, Digitized pictures; Audio: PCM speech, CD-quality audio, Synthesized audio; Video: Broadcast television, Digital video, PC video, video content.

UNIT II

Text and Image Compression Compression Principles & Text Compression: Compression Principles: Source encoders and Destination decoders, Lossless and lossy compression, Entropy encoding, Source encoding; Text Compression: Static Huffman coding, Dynamic Huffman Coding, Arithmetic Coding. Image Compression: Graphics Interchange Format, Tagged image file format, digitized documents, digitized pictures.

UNIT III

Audio and Video compression: Audio Compression: Differential Pulse Code Modulation, Adaptive Differential PCM, Adaptive predictive coding, Linear Predictive coding, Code excited LPC, Perceptual Coding, MPEG Audio coders, Dolby audio coders Video compression: video compression principles, Motion Pictures Expert Group (MPEG), MPEG1, MPEG2.

UNIT IV

INTERNET AND DESIGNING FOR THE WORLD WIDE WEB The internet and multimedia: The internet, Internetworking: Internet addresses, connections, The Bandwidth Bottleneck, Internet services, MIME-Types, The world wide web and HTML, Dynamic web pages and XML, multimedia on the web, Tools for the World Wide Web: web browsers, web servers, web page makers and site builders, plug-ins and delivery vehicles. Designing For The World Wide Web: Developing for the web: HTML is a Markup Language, The Desktop Workspace, The Small Device Workspace, nibbling, Text for the web: making columns of text, flowing text around images; images for the web: GIF and PNG Images, JPEG Images, Using Photoshop, Backgrounds, clickable buttons, Client side image maps, sound for the web, animation for the web.

Text Books:

1. Fred Halsall, Multimedia Communications , Pearson
2. Tay Vaughan, Multimedia, making it work Eighth edition, Tata McGraw-Hill Edition

Reference Books

1. Rao, Bojkovic & Milovanovic, Multimedia Comm. System: Technology , Std. &Network , PHI
2. JohnF. Koegel Bufod, Multimedia Systems , Addison Wesley, Edition. 2000

DEPARTMENT OF ZOOLOGY
M. Sc. ZOOLOGY

Course no.: 16ZOOO1
Semester- IICourse Title: Applied Zoology
MM:T80+IA20
Time: 3 Hr

Note: There shall be seven questions in total. One question will be compulsory (short answer type) covering the entire syllabus and remaining six questions will be set two from each unit. Students are required to attempt compulsory question and 04 more questions selecting at least selecting one from each unit.

Unit-I

Host – Definitive and intermediate, Parasitism, Symbiosis, Commensalism, Reservoir.
Transmission, prevention and control of diseases: Tuberculosis and Swine flu
Principles and applications of ECG, MRI, PET, and CAT.

Unit-II

Life history and pathogenesis of *Plasmodium* sp.
Life history, Medical importance and control of *Aedes* sp.
Life history, pathogenesis and control of *Taenia* sp.
Principles and applications of brain activity recording, and pharmacological testing.

Unit-III

Preservation of gametes in animal and artificial insemination.
Principles and management of Poultry.
Introduction and management of pisciculture
Genetic improvement in animals; Induced breeding in aquaculture.

***As per SOE Zoology**
**** Proposed maximum marks and subject to change in uniformity with other faculties of university**

List of Recommended Books

1. Dent, D. Insect Pest Management
2. Hill, D.S., Timber Press. Agricultural Entomology
3. David, B. V. & Ananthakrishnan. General and Applied Entom
4. ology . T. N., Tata McGraw-Hill Publishing.
5. Asa C. Chandler, Clark P. Read, Introduction to Parasitology, John wiley and Sons., Inc., New York.
6. Thomas W.M. Cameron, Parasites and Parasitism, Billing and Sons ltd. London,
7. Elmer R. Noble, Glenn A. Noble; Parasitology: The Biology of Animal Parasites, Lea and Febiger, Washington.
8. R.P. Hall, Protozoology, Prentice-Hall, Inc. Engtewood diffs. N.J. Charles E. Tuttle Company, Tokya
9. E.O. Wilson. The Diversity of Life (The College Edition), W.W. Northern & Co.
10. Molecular Biology of the Cell, B. Alberts, D. Bray, J. Lewis, M. Raff, K. Roberts and J.D. Watson. Garland Publishing Inc., New York.
11. Molecular Biology and Biotechnology. A comprehensive desk reference, R.A. Meyers (Ed.), VCH Publishers, Inc., New York.
12. Molecular Cloning: a Laboratory Manual, J. Sambrook, E.F. Fritsch and T. Maniatis, Cold Spring Harbor Laboratory Press, New York.
13. Gray's Clinical Neuroanatomy by Mancall **New** Medical Pharmacology at a Glance (7th Ed.)
14. Oxford Handbook of Neurology

M.D.U., ROHTAK

A) Open Elective Courses

Students of all PG programmes under CBCS (w.e.f. 2017-18) are required to study one open elective course in each of the 2nd and 3rd Semesters for 2-Years Programmes and in each of the 4th and 5th semesters for 3-Years Programmes. They may choose any one of the following courses (excluding the courses offered by the departments of their own subjects, if not stated otherwise).

Open Elective Courses of 3rd Semester:-

Sr. No.	Nomenclature of the course	Course Code	Offered by the Department
1.	Computer Aided Drug Design	16BINO2	Bioinformatics
2.	Principles and Applications of Agriculture Biotechnology-II	16CBTO2	Biotechnology
3.	Principles and Applications of Biotechnology-II	16CBTO4	Biotechnology
4.	Human Health & Nutritional Disorders	16BCHO2	Bio-Chemistry
5.	Plants: Source of Food and Health	17BOTO2	Botany
6.	Fundamental of Income Tax	16COMO1	Commerce
7.	Study of War	16DSS22OE2	Defence & Strategic Studies
8.	Principles of Economics	16ECOO2	Economics
9.	Trends and Concerns of Teacher Education	16EDUO2	Education
10.	Disaster Management	16ENVO2	Environmental Science
11.	Food Fundamentals	16FTEO2	Food Technology
12.	Forensic Science	16GENO2	Genetics
13.	Introduction of Geography	17GEOO1	Geography
14.	Sources of Geographical Data	17 GEOO2	Geography
15.	Bhartiya Sahitya	16HNDO1	Hindi
16.	Survey of Sources of Indian History	16HISO2	History
17.	Fundamentals of Marketing	16IMSO2	IMSAR
18.	Introduction of Mass Media	17JRMO1	Journalism
19.	Constitutional Law	16LAWO2	Law
20.	Information Sources and Literacy	16LISO2	Library & Information Science
21.	Statistical Tools using SPSS	16MATO3	Mathematics
22.	MATLAB	16MATO4	Mathematics
23.	Principles of Medical Biotechnology II	16MBTO2	Medical Biotechnology
24.	Microbial Technology for Entrepreneurship	16MCBO2	Microbiology
25.	Sources of Energy-II	16PHYO2	Physics
26.	Environment Protection Administration	16PUBO2	Public Administration
27.	Natural and Manmade Disaster	16POLO2	Political Science

28.	Indian Society	16SOCO2	Sociology
29.	Optimization Techniques	16STAO3	Statistics
30.	Wild Life and Conservation	16ZOOO2	Zoology

CENTRE FOR BIOINFORMATICS
M. D. UNIVERSITY, ROHTAK

CBCS-SCHEME OF EXAMINATION (M.Sc. -Bioinformatics)-2016-17 onwards

Course Title: Computer Aided Drug Design Credit: 3 0 0

Course Code: 16BINO2 MM. Th 80+ IA 20 Time: 3 Hours

Note: In all 7 questions are to be set, Question No. 1 is compulsory and to be set covering entire Syllabus. 6 questions will be set with two questions from each unit. Students are required to attempt one compulsory question and 4 other questions, *i.e.*, selecting atleast one from each unit.

UNIT I

Introduction to pharmacogenomics and pharmagenetics, clinical trials in pharmagenomics, polymorphism of CYP450 enzymes affecting drug response, role of SNP in pharmacogenomics, The multi Drug Resistance proteins: drug carriers affecting drug response.

UNIT II

Basis of Drug Pharmacokinetics and Pharmacodynamics, molecular descriptors, QSAR methodologies 3D QSAR. Structure based drug designing, Ligand based drug designing, Different docking methodologies, success stories in docking.

UNIT III

Pharmacophore modeling, Pharmacophore generation- (Hiphop and HypoGen theories). Combinatorial libraries, High thoughtput screening, Virtual screening, Lipinski's rule of five and its applications. Chemoinformatics: Introduction, Chemical Database(ACD,MDDR and WDI), Application of Chemoinformatics in CADD.

M.Sc Agriculture Biotechnology **Semester-III**

Course Title: Principles and Applications of Agriculture Biotechnology-II

MM. Th 80+IA 20

Time: 2 h

Course Code No. 16CBTO2

NOTE: In all four questions will be set, two from each unit and one compulsory question of short answer type covering all the two units. Students are required to attempt one compulsory question and two other questions selecting at least one from each unit.

Theory

UNIT I

Gene Cloning and DNA Analysis in Agriculture: Methods in Molecular Cloning, Transformation of DNA: Chemical method and Electroporation; Gene delivery: Microinjection, eletroporation, biolistic method (gene gun), liposome and virus mediated gene delivery, *Agrobacterium* mediated gene delivery.

UNIT II

Development of transgenics for abiotic & biotic stress tolerance, Plants that make their own insecticides - The δ-endotoxins of *Bacillus thuringiensis,* Herbicide resistant crops (roundup ready crops), Gene subtraction: RNA silencing, CRISPER technology.

UNIT III

Genetically modified Crops: safety, risks and public concerns: GM foods-merits and demerits, Safety tests on commercial GM crops (GM maize, GM potatoes, GM rice, GM cotton, peas), Allergenicity studies, Public concerns-global scenario, Consumer's attitude towards GM foods, GM foods: issues with respect to India. Traceability of GMOs in the food production chain, Environmental and Safety concerns with selectable markers, The terminator technology, The possibility of harmful effects on the environment and humans.

Suggested readings:

1. Hou CT, Shaw JF (2009) Biocatalysis and agricultural biotechnology, CRC Press, USA
2. Brown, TA (2010) Gene Cloning and DNA Analysis: An Introduction, Sixth Edition. A John Wiley & Sons, Ltd., Publication, Germany.
3. Bhojwani SS, Soh WY (2005) Agro biotechnology and plant tissue culture, Oxford Press.
4. Clark DP, Pazdernik NJ (2009) Biotechnology: Applying the Genetic Revolution. Elsevier Academic Press, USA.
5. Primrose SB, Twyman RM (2006) Principles of Gene Manipulation and Genomics, 7th Edition. Blackwell Publishing, Oxford, U.K.
6. Kumar HD (2005) Agricultural biotechnology, Daya Publ House, India
7. Newbury HJ (2009) Plant molecular breeding, John Wiley and Sons., USA.
8. Kumar A, Shekhawat NS (2009) Plant tissue culture and molecular markers: their role in improving crop productivity (IK International)
9. Das HK (2010) Biotechnology, 4th Edition, Wiley India Pvt. Limited, India
10. Bawa AS and Kumar A (2013) Genetically modified foods: safety, risks and public concerns. J Food Sci Technol. 50(6): 1035–1046.

M.Sc Biotechnology **Semester-III**

Course Title: Principles and Applications of Biotechnology-II

MM. Th 80+IA 20

Time: 2 h

CourseCode No. 16CBTO4

NOTE: In all four questions will be set, two from each unit and one compulsory question of short answer type covering all the two units. Students are required to attempt one compulsory question and two other questions selecting at least one from each unit.

UNIT I

Production of proteins from cloned genes: Cloning vectors and expression vectors, primer designing, open reading frame (ORF) and DNA Restriction pattern analysis, *E. coli* expression vectors, criteria for choosing different vectors, importance of different *E. coli* strains for expression, optimization of expression of recombinant proteins in *E. coli*, Codon optimization.

UNIT II

General problems with the production of recombinant proteins in *E. coli*, Dealing with insoluble proteins, Recombinant protein production in Eukaryotic cells. Processing, purification and characterization of recombinant proteins. Applications of recombinant protein production.

UNIT III

Study of Genomes: Genome annotation, identifying the genes in a genome sequence, determining the function of an unknown gene. Study of gene expression and regulation: identification of gene transcript, identifying protein binding sites on a DNA molecule: methods to study DNA protein interactions. Identification of promotor and control sequences, Analysing and comparing transcriptome, *in vitro* transcription, studying and comparing proteome: 2DE, MudPIT, LC-MS. Protein-Protein interactions (PPIs).

Suggested readings:

6. Brown, TA (2010) Gene Cloning and DNA Analysis: An Introduction, Sixth Edition. A John Wiley & Sons, Ltd., Publication, Germany.
7. Clark DP, Pazdernik NJ (2009) Biotechnology: Applying the Genetic Revolution. Elsevier Academic Press, USA.
8. Primrose SB, Twyman RM (2006) Principles of Gene Manipulation and Genomics, 7th Edition. Blackwell Publishing, Oxford, U.K.
9. Wiley JM, Sherwood LM, Woolveron CJ (2008) Prescott, Harley and Klein's Microbiology. McGraw Hill Higher Education.
10. Primrose SB and Twyman RM (2008) Genomics: Applications in human biology. Blackwell Publishing, Oxford, U.K.

16BCHO2 :Human Health and Nutritional Disorders

Note: Question 1 will be compulsory and will cover the entire syllabus in the form of short questions. Question 2 to 7 will include two questions from each unit and candidate will have to attempt one question from each unit. Overall, four questions to be attempted. All questions to carry equal marks i.e. 20.

MM. Th 80+IA 20

Unit I

*Food Physiology***:** Concept of balanced diet and energy content of foods; Basal and resting metabolism- influencing factors, Absorption of carbohydrates, lipids, proteins, nucleic acids, minerals and vitamins.

Common metabolic disorders: Diabetes mellitus, disorders of HDL-cholesterol, LDL-cholesterol, triglycerides, phenylketonuria, albinism.

Antioxidants: Free radicals: definition, formation in biological Systems. Natural anti-oxidants, defense against free radicals. Role of free radicals and antioxidants in health and disease.

Unit II

Vitamins: Dietary sources, biochemical functions and specific deficiency diseases associated with fat and water soluble vitamins; Hypervitaminosis symptoms of fat-soluble vitamins.

Minerals: Dietary sources and deficiency disorders of dietary calcium, phosphorus, magnesium, iron, iodine, zinc and copper.

Malnutrition and blood disorders: Etiology, clinical features, metabolic disorders and management of Marasmus and Kwashiorkor, Nutritional anemia - vitamin $B_{12,}$ folate and iron deficiency anemia; hemoglobinopathies and thalassemias.

Unit III

Obesity: Definition, classification and biochemical basis; Genetic and environmental factors leading to obesity; Obesity related diseases and management of obesity.

Cardiovascular disease: Diseases of Liver, Gall bladder & Pancreas-Hepatitis, (A, B, and C), alcoholic liver disease, Gall stones, pancreatitis, Prevention and dietary management.

Clinical significance of aspartate aminotransferase, alanine aminotransferase, lactate dehydro-genase, amylase, lipase and trypsin.Diagnosis of jaundice and clinical importance of bilirubin.

Suggested Readings for 16BCHO2: Human Health and Nutritional Disorders:

1. Textbook of Medical Biochemistry ***By*** MN Chatterjea and Rana Shinde, Jaypee Brothers.
2. Review of Medical Physiology (Lange Basic Science) (Paperback) ***By*** William F. Ganong. Publisher: McGraw-Hilll Medical
3. Clinical Biochemistry ***By*** Richard Luxton. Scion Publishing Ltd.
4. Principles of Medical Biochemistry: With STUDENT CONSULT Online Access (Paperback) ***By*** Gerhard Meisenberg and William H. Simmons. Publisher: Mosby.
5. Essentials of Food and Nutrition Vol I & II, ***By*** M. Swaminathan. Bangalore Printing and Publishing Co. Ltd.
6. Modern Nutrition in Health and Diseases, ***By*** Maurice E Shils and Vernon Robert Young, 7th Ed., Pub: Lea &Febiger.
7. Handbook of Nutrition and Food 2nd Ed., ***By*** Carolyn Berdanier, Johanna Dwyer and Elaine Feldman, CRC Press
8. Nutritional Biochemistry (Hardcover) ***By*** Tom Brody. Academic Press.
9. Nutritional Biochemistry (Paperback) ***By*** S Ramakrishnan and S. Venkat Rao. TR Publications
10. Nutritional Biochemistry and Metabolism: With Clinical Applications (Hardcover) ***By*** Maria C. Linder. Publisher: Appelton and Lange

DEPARTMENT OF BOTANY
OPEN ELECTIVE

M. Sc. Botany
(Semester-III)
Paper Code: 17BOTO2
Title of Paper: Plants: Source of Food and Health

Max. Marks:80
Internal Assessment: 20
Time: 3 hrs.

Note: The examiner is required to set even questions in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt four questions - Question 1 and three more questions selecting one from each unit.

Unit- I

Agriculture: origin, history, world centres of primary diversity of domesticated plants, shifting cultivation and consequential damage to forest ecosystem, benefits and adverse consequences of green revolution, emerging problems of agriculture sector of India and their possible solutions, concept of organic farming and sustainable agriculture

Unit- II

Horticulture: scope, classification and importance; Important commercial horticultural crops of India and Haryana, some underutilized fruits and vegetables of Haryana, Home gardening and their relevance in present time, Factors affecting horticulture in India, Issues in post harvest management of fruits and vegetables in India, National Horticultural mission

Unit- III

Medicinal Plant: Diversity and distribution, General account of local plants of medicinal importance, Drugs developed from traditional medicines, Bioprospection and biopiracy of medicinal plants, Indian initiatives for promoting the use of medicinal plants, Factors affecting medicinal plants diversity, conservation and management

(Open Elective Paper)
Fundamentals of Income Tax
Paper Code: 16COMO1

Maximum Marks: 100
Credits: 3:0:0 **Theory Marks: 80**
Time Allowed: 3 Hours **Internal Assessment Marks: 20**

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of equal marks. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All questions shall carry equal marks.

Unit-I

Introduction: Meaning of tax, scope, objectives, importance, Important terms-assessee, person, previous year, assessment year, income, gross total income, total/taxable income, casual income, agriculture income, company , tax evasion, tax avoidance, tax planning, tax management.

Unit-II

Determination of residential status and incidence of tax with reference to residential status of an individual; exempted incomes of an individual

Unit-III

Income from various heads (basic introduction only), clubbing of incomes, set of and carry forward of losses, Computation of gross total income and taxable income.

Unit-IV

Computation of tax liability of an individual; filling and filing of Income Tax Returns (ITR-I & II only).

Note:

1. The objective of this paper is to make the students familiar with the mechanism of Income Tax Law
2. The examiner is not required to ask the students to calculate income from various heads of an individual. The examiner is also required to give computed incomes from different heads in the question paper.

3. The actual amount of allowed deductions with section must be given clearly in the question.

Suggested Readings:

1. *Direct Taxes law & Practice – Dr. H.C.Mehrotra & Dr. S.P. Goyal, Sahitya Bhawan Publications, Agra.*
2. *Direct Taxes & Practice – Dr. V.K. Singhania Taxmann Publication.*
3. *Direct Taxes law & Practice – Dr. Bhagwati Prasad – Wishwa Prakashan, N.Delhi.*
4. *Simplified Approach to income Tax: Dr. Girish ahuja & Dr. Ravi Gupta – Sahitya Bhawan Publishes & Distributors, Agra.*

SEMESTER-III

PAPER CODE-16DSS22OE2

STUDY OF WAR

Maximum Marks: 100

Credits: 3:0:0 **Theory Marks: 80**

Time Allowed: 3 Hours **Internal Assessment Marks: 20**

INSTRUCTION FOR THE PAPER SETTERS

The Question Paper will consist of five units: I, II, III, IV and V. Unit-V will be compulsory. The first Four Units will consist two questions each from the respective unit **and each question will carry 16 marks. Unit V of the question paper will consist** Eight **short answer type questions, without any internal choice and will cover the entire syllabus uniformly. Each short answer type question will carry Two marks. The Question Paper should be set strictly according to the syllabus. Separate marks for each question** should **be indicated in the question paper.**

UNIT-I

1. Nature of War:-

- **a) Definition, Scope and Causes**
- **b) Evolution of War: - Feudal, Dynastic, Peoples and Modern War**
- **c) Cold War: - Definition, Concept, Historical Evolution**

UNIT-II

2.

- **a) Principal of War**
- **b) Feature of Modern Warfare**
- **c) Future of War**

UNIT-III

3. Strategy, Tactics and Logistics:-

- **a) Definition of Grand Strategy, Strategy and Tactics**
- **b) Distinction between Grand Strategy, Strategy and Tactics.**
- **c) Types of Strategy – Strategy of Indirect Approach, Strategy of Annihilation and Strategy of Exhaustion**

UNIT-IV

4.

- **a) Origin and Causes of World War-I**
- **b) Origin and Causes of World War-II**
- **c) Indo-Pak War-1971: Origin and Causes**

Recommended Books:-

1. **Howard, Micheal, "Theory and Practice of War".**
2. **Howard, Micheal, "The Causes of War".**
3. **Bernard Black, L., "War its Causes".**
4. **Wright, Quincy, "A Study of War, University of Chicago Press, Chicago, USA. 1965.**
5. **Brodie, Bernard, "Strategy in the Missile age".**
6. **Pees David, "Korea the Limited War".**
7. **Carlvon Clasewitz (ed), "Principles of War", Army Publishers, Delhi-6, 1968.**
8. **Lt. Gen. K.K. Nanda, "Indo-Pak War-1971" (Hindi), Parbhat Publications, Asaf Ali Road, New Delhi.**

Semester-III

16ECOO2- Principles of Economics (Open Elective Paper)

Max. Marks: 100 Written Exam:80
Time: 3 Hrs. Internal Assessment: 20

Unit -1

Why study economics? The scope and method of economics; scarcity and choice; questions of what, how and for whom to produce and how to distribute output.

Unit-II

Indian Economy on the eve of Independence, British rule and its impact on Indian Economy, Emergence and development of Planning exercise in India – historical debates.

Unit-III

Trends and patterns in structure of population over time – growth rate, gender, rural-urban, literacy, regional; Structure and trends of Poverty and Inequality (interpersonal and regional); Inflation – trends, structure and causes; Unemployment – trends, structure and types.

Unit-IV

Trends in Agricultural Production and Productivity; Land Reforms – Genesis, Progress and current status; Green Revolution – Measures and its effects. Trends and Patterns of Industrial Sector; Changes in the structure of Indian Industry.

Note:

(A) Nine questions would be set in all.
(B) Question No. 1 based on the entire syllabus, would be compulsory. It would contain eight short answer questions of two marks each.
(C) There would be two questions (16 marks each) from each of four units.
(D) Candidates would be required to attend five questions (one compulsory and selecting one from each unit).)

Reading List:

- D.N. Divedi: Principles of Economics, 2nd Edition, Vikas Publication House.
- R Dutta and K P M Sundaram: Indian Economy, S Chand A.N.Agarwal: Indian Economy, Problems of Development and Planning, New Age.
- Mishra and Puri: Indian Economy, Himalaya.
- Planning Commission: Twelfth Five Year Plan, Vol I, II and III, Academic Foundation.
- Government of India: Economic Survey (latest issue)

.**M.Ed. (2016-18)**

16 EDU02
OPEN ELECTIVE - II (TRENDS AND CONCERNS OF TEACHER EDUCATION)

Time: 3 Hours **Max. Marks: 100**
Credits: 3 **(Theory: 80, Internal: 20)**

NOTE FOR PAPER SETTER

Paper setter will set 9 questions in all, out of which student will be required to attempt 5 questions

Q. No. 1 will be compulsory and will carry 16 marks. It will comprise of 4 short answer type questions of 4 marks each to be selected from the entire syllabus.

Two long answer type questions will be set from each of four units, out of which the students will be required to attempt one question from each unit. Long answer questions will carry 16 marks each.

All questions carry equal marks

COURSE OBJECTIVES:

After completing the course, the students will be able to:

Develop an idea about the structure of secondary education in India.

Understand the recommendations of different education commissions regarding secondary & Senior Secondary education commissions.

Acquaint the students with the need, scope and purpose of educational management in terms of national needs.

make aware of the importance of making right choices in life, education, vocation etc.

develop and promote understanding of basic principles, areas, importance of guidance and counseling.

make students conversant with the practices of guidance and vocational choices.

understand the concept of teacher education along with its need and scope

understand the objectives of teacher education at elementary, secondary and higher education

develop understanding about the structure, curriculum and modes of pre- service teacher education and needs of innovation in pre-service teacher education programmes describe the need, concept and scope of teacher education and historical development with special emphasis on different documents.

develop in students an understanding of the concept and philosophy of inclusive education in different contexts

develop in students an understanding of the nature and types of diverse learners

enable students to analyze the trends and issues in inclusive education

COURSECONTENTS

UNIT- I

Introduction to Secondary & Senior Secondary Education

Meaning, Aims & Objectives of Secondary & Senior Secondary Education

Secondary Education in India- Historical perspectives, pre & post Independence

Recommendations of various committees and commissions: Secondary Education Commission, Kothari Commission, Programme of Action 1992, NPE 1986, Ramamurti Review Committee, Janardhan Reddy Committee, Yashpal Committee, RMSA & NCF-2005

Educational Management

Meaning, Concept & need for Educational Management at Secondary to Senior Secondary School Level

Management at Nation: MHRD,CABE, NCERT

UNIT – II

Introduction to Guidance

Guidance Movement in India: Pre & Post Independence.

Concept, Principles & Functions of Guidance.

Types of Guidance: Educational, Vocational, Social& Personal Guidance.

Group Guidance: Meaning, Objectives, Characteristics, Advantages, Problems, Principles & Techniques.

Contemporary Models of Guidance; Mathewson Model, Sholen's Model, Chapman Model & Hoyt's Model.

Introduction to Counseling

Concept, Principles, Techniques & Procedure of Counselling.

Approaches of Counseling: Directive, Non-Directive, Eclectic Counselling.

Theories of Counseling: Freud's Psychoanalytic, Behaviouristic, Gestalt

Skills of Counseling: Building Trust, Listening, Observation & Empathy

Counselor: Characteristics, Functions &Ethics

UNIT-III

Teacher Education Introduction to Teacher Education

Concept, Need and Scope of Teacher Education.

Historical Development of Teacher Education

Aims and Objectives of Teacher Education at:

i) Elementary Level.
ii) Secondary Level.
iii) Higher Level.

Pre- Service Teacher Education: Concept, Nature, Objectives and Scope.

In-service Teacher Education; concept, Need, Objectives and areas of Professional development.

Quality Assurance in Teacher Education

UNIT – IV

Inclusive Education for Children with Diverse needs

a) Introduction to Inclusive Education: Definition, concept and importance of Inclusive Education.

Concept of Access, Equity, Diversity, Human Rights & Social Justice.

Readiness of School, Principles and Models of Inclusion

b) Children with Diverse Needs

Definition and characteristics of children with sensory (hearing, visual and physically challenged) intellectual (gifted, talented and children mentally challenged children), developmental disabilities (autism, cerebral palsy, learning disabilities), social and emotional problems, scholastic backwardness, under-achievers, slow learners and other marginal groups.

Suggested Readings:

Aggarwal, J.C. (2008). Education in the Emerging Indian Society. Delhi: Shipra Publication.

Chauhan, S. (2012). Educational Management. New Delhi: Pearson Publication.

Sharma, R.A.(2009). Educational Administration & Management. Meerut:R Lal Book Depot.

Vashist, S.R. (2008). Educational Administration in India. New Delhi:Anmol Publication Pvt. Ltd.

Aggarwal, R. (2010). Elementary Guidance and Counselling , New Delhi: Shipra Publication.

Bala, Rajni.(2007). Guidance and Counselling: Modern Review, New Delhi: Afa Publication.

Chandra, R.(2009). Career information and Guidance and Counselling, Delhi:Isha Books.

Gibson, R. L. &Mitchell, M. (2008). Introduction Counselling and Guidance, New Delhi: PHI Learning Pvt. Ltd.

Kottler, J. A. & Shepard, D. S.(2008). Counselling Theories & Practices, Cenage Learning:1st Edition.

Rao, S N.(2006). Counselling and Guidance ,Delhi :McGraw hill Publication.

Rao, S. N.& Hari, H. S.(2004). Guidance and Counselling,New Delhi:Discovery Pub. House.

Saxena, A. (2006). Organization of Guidance Service ,Delhi: Rajat Publications.

Shrivastava, K.K. (2003). Principles of Guidance &Counselling , New Delhi : Kanishka Publishers. Singh, R. (2002). Educational & Vocational Guidance , New Delhi : Commonwealth
Publishers

Yadav, R.H. (2012). Guidance & Counselling , New Delhi: APH Publishing Corporation

National Curriculum Framework for Teacher Education; Towards Preparing Professional and Humane Teachers, (2009) NCTE. New Delhi.

Mangla, S. (2000). Teacher Education: Trends and Strategies. New Delhi : Radha Publishing.

MHRD (1986). National Policy of Education and Program of Action. New Delhi, Govt. of India.

MHRD (1992). Program of Action. New Delhi, Department of Education, Govt. of India.

Govt. of India (1992). Report of C.A.B.E... New Delhi: Committee Department of Education.

Kohli, V.K. (1992). Teacher Education in India, Ambala: Vivek Publishers.

N.I.E.P.A. (1984). Report on Status of Teachers, New Delhi.

Sharma, R.A. (2005). Teacher Education, Meerut: Loyal Book Depot.

Udyaveer (2006). Modern Teacher Training, New Delhi: Anmol Publications

Ahuja. A; Jangira, N.K. (2002). Effective Teacher Training; Coop erative Learning Based Approach. New Delhi National Publishing house.

Bartlett, L. D. and Weisentein, G. R. (2003). Successful Inclusion on for Educational Leaders . New Jersey: Prentice Hall.

Daniels, H. (1999). Inclusive Education. London: Koegan.

Gore, M. C. (2004). Successful Inclusion Strategies for Secondary and Middle School Teachers, Crowin Press: Sage Publications.

Hegarthy, S. & Alur, M. (2002). Education of Children with Special Needs : from Segregation to Inclusion, Corwin Press: Sage Publishers.

Jha, M. M. (2002). School without Wal ls: Inclusive Education for All. Oxford: Heinemann Education.

Karten, T. J. (2007). More Inclusion Strategies that Wor k . Corwin Press, Sage Publications.

Panda, K. C. (1997). Education of Exceptional Children. New Delhi: Vikas Publications.

Rayner, S. (2007). Managing Special and Inclusive Education , Sage Publications.

Sharma P.L (2003). Planning Inclusive Education in Small Schools, R.I E. Mysore

Semester –III
Open Elective

16ENVO2: Disaster Management Time : 3 Hours.
MM. Th 80+IA 20

Note: 1. Seven questions will be set in all.
2. Question No. 1 will be objective covering the entire syllabus & compulsory. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt five in total, Question I and four by selecting at least one from each unit.

UNIT- I

Disaster- Causes and phases of disaster, Rapid onset and slow onset disasters. Nature and responses to geo-hazards, trends in climatology, meteorology and hydrology. Seismic activities. Changes in Coastal zone, coastal erosion, beach protection. Coastal erosion due to natural and manmade structures.

UNIT- II

Floods and Cyclones: causes of flooding, Hazards associated with flooding. Flood forecasting. Flood management, Integrated Flood Management and Information System (IFMIS), Flood control. Water related hazards- Structure and nature of tropical cyclone, Tsunamis – causes and physical characteristics, mitigation of risks.

UNIT- III

Earthquakes: Causes and characteristics of ground-motion, earthquake scales, magnitude and intensity, earthquake hazards and risks, Volcanic land forms, eruptions, early warning from satellites, risk mitigation and training, Landslides.

Mitigation efforts: UN draft resolution on Strengthening of Coordination of Humanitarian Emergency Assistance, International Decade for Natural Disaster Reduction (IDNDR), Policy for disaster reduction, problems of financing and insurance.

Reference Books:

1. Bolt, B.A. Earthquakes , W. H. Freeman and Company, New York. 1988
2. Carter, N,W. Disaster Management: A Disaster Manager's Hand Book, Asian Development Bank, Manila. 1992
3. Gautam Ashutosh. Earthquake: A Natural Disaster, Ashok Publishing House, New Delhi. 1994
4. Sahni, P.and Malagola M. (Eds.).Disaster Risk Reduction in South Asia, Prentice-Hall of India, New Delhi. 2003.
5. Sharma, V.K. (Ed.). Disaster Management, IIPA, New Delhi. 1995.
6. Singh T. Disaster management Approaches and Strategies, Akansha Publishing House, New Delhi. 2006
7. Sinha, D. K. Towards Basics of Natural Disaster Reduction, Research Book Centre, New Delhi. 2006
8. Smith, K. Environmental Health, Assessing Risk and Reduction Disaster, 3rd Edition, Routledge, London. 2001 21

17FTEO2

Food Fundamentals

There will be seven questions in all. The first question comprising of short answer type questions covering the entire syllabus will be compulsory. The remaining eight questions will comprise of a set of two questions from each unit and the candidate will be required to attempt question 1 and four more questions selecting at least one from each unit.

MM: Th 80+IA 20
Time: 3h

Unit I. Food nutrients and balanced diets

Characteristics of basic food groups and their contribution to the diet, Food functions, Nutrients**:** macronutrient (vitamins, carbohydrates, proteins), micronutrients (minerals)**,** balanced diet: definition, factors affecting balanced diet

Unit II. Food processing and preservation

Objectives of cooking food and cooking methods: different cooking methods, effect of different methods of cooking on nutritive value of food. Food preservatives: chemical preservatives, salt, sugar, oil as food preservative. Food preservation by drying, dehydration, cooling/freezing and thermal processing including sterilization, blanching, pasteurization.

Unit III. Food packaging and labeling

Food packaging and its functions, food packaging & labeling, packaging types, understanding labelling rules & regulations, nutritional labeling: serving sizes, daily values, health claims etc., labelling requirements for pre-packaged foods

Recommended readings:

1. Potter, N.N and Hotchkiss, J.H. Food Science. CBS Publishers and distributors
2. Vieira, E.R. Elementary Food Science. Chapman and Hills publication
3. McWilliams, M. Food Fundamentals. Pearson India Education Services (Indian edition)
4. Training manual for food safety regulators, Volume I. Food safety and Standards Authority of India.

Open Elective Paper (offered by Department of Genetics)

Paper Code: 16GENO2 **FORENSIC SCIENCE** **Credits: 3**

Internal Assessment Marks: 20

Time: 3hrs **Max. Marks: 80**

Instructions

There will be a total of seven questions. Question No. 1 will be compulsory and shall contain ten short answer type questions without any internal choice and it shall cover the entire syllabus. The remaining six questions will include two questions from each unit. Students will be required to attempt one question from each unit.

Unit –I

Forensic Science: Definition of Forensic Science, Role of the Forensic Laboratory, History and Development of Forensic Science in India, Branches of Forensic Science. Administration and Organizational Setup: Brief introduction to DFSS, CFSL, GEQD, SFSL, RFSL, MFSL, FPB, NICFS, CDTS, NCRB and BPR&D. Educational qualifications and employment in Forensic Science Laboratory.

Unit –II

Forensic Evidences: Concise of Forensic Physical, Biological, Chemical and Psychological Sciences, types of cases and evidences involved. Laws and Principles of Forensic Science: Law of Exchange (Locard), Law of Individuality, Law of Comparison, Law of Progressive Changes and Law of Probability. Criminalistics: Definition, Securing & Searching methods, Documentation of crime scene. Methods of collection of forensic evidences, Role of Police at the Crime scene, scientific help at crime scene, handling of various types of crime scenes by police.

Unit –III

Basics of signature and handwriting comparison, fake currency note examination. Classification of Fingerprint patterns, cases involved methods of development and comparison of fingerprints. Forensic expert, Admissibility of Forensic testimony in Court of law, Frye and Daubert standards, Cross Examination, Ethics in Forensic Science. Accreditation of Forensic laboratories by NABL.

Suggested Books:

1. James, S.H and Nordby, J.J. (2003) Forensic Science: An introduction to scientific and investigative techniques CRC Press,
2. Saferstein : Criminalistics (1976) Prentice Hall Inc., USA.
3. Sharma, B.R. (1974) Forensic Science in Criminal Investigation and Trials, Central Law Agency, Allahabad, 1974.
4. J A Siegel, P.J Saukko (2000) Encyclopedia of Forensic Sciences Vol. I, II and III, Acad. Press

M.A. Geography Semester-III Session 2017-18 Onwards

17GEOO1: INTRODUCTION TO GEOGRAPHY

Credit: 03 (2+1+0)
End Semester Exam: 80 marks
Internal Assessment: 20 marks
Total: 100 marks
Time: 3 hrs.

Learning Objectives:

The course on **Introduction to Geography** will discuss the basic concepts in geography. It is specifically designed to give an exposure of geographical concepts to students other than formal students of geography.

Learning Outcomes:

Student will be able to understand the geographical concepts which are relevant in day to day life.

Unit-I

Solar system , solar and lunar eclipse; Earth- shape, movements, formation of day/nights and seasons ; location-latitude-longitude, longitude and time zones.

Unit-II

Interior of earth; vulcanism and earthquakes; plate tectonics; weathering and erosion; brief introduction to major landforms.

Unit-III

Weather and climate: factors affecting and distribution; composition and structure of atmosphere; atmospheric pressure and global winds; introduction to Monsoon.

Unit-IV

Relief of oceans; oceanic salinity; circulation of oceanic water; currents of Atlantic, Pacific and Indian Oceans.

Note (i): Open Elective to be chosen from the basket of Open Electives (OEs) provided by the University.

(ii) The question paper will have five units. First four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

Leong, Goh Cheng.,2015, *Certificate Physical and Human Geography*, Oxford University Press, New Delhi.

Getis Arthur and Bjelland Mark and Getis Victoria., 2014,*Introduction to Geography*, McGraw Hill Education.

Singh, Savinder., 2006, Physical Geography, *Pravalika Publications*, Allahabad.

Strahler Alan and Strahler Aurthur., 2005, *Introducing Physical Geography*, John Wiley & Sons, Inc.

M.A. Geography Semester-III Session 2017-18 onwards

17GEOO2: SOURCES OF GEOGRAPHICAL DATA

Credit: 03(2+1+0)
End Semester Exam: 80 marks
Internal Assessment: 20 marks
Total: 100 marks
Time: 3 hrs.

Learning Objectives:

The objective of the course is to apprise the students about the various sources of geographical data and its importance in the field of geography.

Learning Outcomes:

Students shall learn about the significance of geographical data, various sources related to physical and cultural environments, households, population, assets, facilities, building materials and policy interventions.

Unit - I

Nature and Main Sources of Geographical Data: Place Names, Census of India, Field Studies.

Unit - II

Place Names (Based on Physical and Cultural Environments).

Census of India: Primary Census Abstract: (Number of Households, Population, Sex, 0-6 Years Population, Scheduled Castes and Scheduled Tribes Population, Literate, Workers, Main Workers, Marginal Workers (Cultivators, Agricultural Labourers, HHI, Other Workers and Non -Workers and Non- Workers in respect of Total, Rural and Urban Population).

Unit-III

Census of India: Household Data: Condition of Household, Availing Banking Services, Availability of various Assets, Pre- dominant materials of Roof, Wall and Floor, Sources of Drinking Water and Location, Lighting, Availability of Latrine Facility, Types of fuel for Cooking.

Unit-IV

Census of India: Village Directory (Area. Population, Availability of Educational, Medical, Postal, Drinking Water, Communication Facilities, Land Use Pattern.

Note (i): Open Elective to be chosen from the basket of Open Electives (OEs) provided by the University.

(ii) The question paper will have five units. Each of the first four units of question paper will contain two questions from each unit of the syllabus. Candidate(s) are required to attempt one question from each unit. The unit five shall be compulsory and shall contain eight short answer type questions covering entire syllabus. All questions carry equal marks.

Recommended Readings:

Census of India (2011): Instruction Manual for House Listing and Housing Census, Ministry of Home Affairs, Government of India, New Delhi.

Census of India (2011): Primary Census Abstract, India, CD, New Delhi.

Census of India (2011): Village Directory, District Census, CD, New Delhi.

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Paper Code: 16HNDO1

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Paper: Survey of Sources of Indian History
Paper Code: 17HISO2

Max.Marks : 100
Theory : 80
I.A : 20

Note: Nine questions are to be set in all spreading into five units Each of the first four units shall contain two questions from each unit of the syllabus and Unit-V (Q. No. 9) which will be compulsory, shall contain eight short answer type questions (two marks each) covering the entire syllabus. The Candidates shall be asked to attempt five questions in all selecting one question from each unit including compulsory question. All questions shall carry equal marks.

Unit – I

Sources of Ancient India-I

a) Archaeological Sources

Stone Tools, Pottery, Coins & Inscriptions

b) Literary Sources

Vedic Literature, Epics (Ramayan & Mahabharat), Buddhist and Jain Sources

Unit-II

Sources of Ancient India-II

a. Harsacharita, Rajtaringini
b. Megasthanes, Al Beruni
c. Arthashastra

Unit-III

Sources of Medieval India

a. Ziauddin Barani: Fatwa-i-Jahandari
c. Babur : Tuzak-i-Baburi
d. Abul Fazal : Akbar Nama (3 Vols)

Unit-IV

Sources of Modern India

a. Archival Records
b. Private Papers: Officials and Non-Officials
c. Newspapers and Periodicals

Suggested Readings:

Sankalia, H.D. : Stone Age Tools, their Techniques and Uses (Pune, 1964)
Sircar, D.C. : Indian Epigraphy, (Delhi, 1965)
Puri, B.N. : India as Described by Early Greek Writers
Majumdar, R.C. : Classical Accounts of India, (Calcutta, 1960)
Pargiter, F.E. : Ancient Indian Historical Tradition, (London, 1922)
Winternitz, M. : History of Indian Literature 3 Vols, (New Delhi-1963-67)
Law, B.C. : India as Described in the Early Texts of Buddhism and Jainism
Birani, Ibn-i-Hasan : Maqalat-i-Barani-Karachi, (N.D.)
Akbar S. Ahmed : Discovering Islam: Making Sense of Muslim History and Society, (New Delhi, 1990.)
Elliot, Sir H.M. & J. Dowson : History of India as Told by its Own Historians, 8 vols., London, (1867-77)
Rosenthal, F. : History of Muslim Historiography, (Leiden, 1952)
Sarkar, Jagdish Narayan : History of History Writings in Medieval India, (Calcutta,1977)
Grewal, J.S. : Muslim Rule in India, The Assessment of British Historians, (Calcutta, 1970)
" : Medieval India: History and Historians, (Amritsar, 1975)
Ibn, Khaldum : Muqaddiman: An Introduction to History, Eng. Tr. Ero Franz Rosenthal, (London, 1958)
S.P.Sen (Ed.) : Historians and Historiography in Modern India, (Bombay, 1970)
Mukhia, Harban : Historians and Historiography During the Reign of Akbar, (New Delhi,1976)
Philips,C.H.(ed.) : Historians of India, Pakistan and Ceylon, (London,1961)
Publication Division, Ministry of I&B, Govt. of India : Gazetteer of India Vol.II (History & Culture)

FUNDAMENTALS OF MARKETING
Course Code: 16IMSO2

MM: Th 80+IA 20

Time: 3 hours

Course Objective:
This course is designed to promote understanding of concepts, philosophies, processes and techniques of managing marketing operation and to develop a feel of the market place.

Unit -I
Nature and scope of marketing: corporate orientation towards marketplace; building and delivering customer value and satisfaction; retaining customers; marketing environment

Unit -II
Analyzing consumer markets and buyer behaviour; market segmentation, positioning and targeting; tools of product differentiation; marketing strategies in the different stage of the product life cycle

Unit -III
New product development process; product mix and product line decisions; branding decisions; pricing strategies; managing marketing channels; wholesaling and retailing

Unit -IV
Advertising and sales promotion; public relations; personal selling; evaluation and control of marketing effort; web marketing; green marketing

Suggested Readings:

1. Kotler Philip and Keller; Marketing Management; PHI, New Delhi
2. Kotler, Philip, Kevin Keller, A. Koshy and M. Jha, Marketing Management in South Asian Perspective, Pearson Education, New Delhi
3. Kerin, Hartley, Berkowtz and Rudelius, Marketing, TMH, New Delhi
4. Etzel, Michael J, Marketing: Concepts and Cases, TMH, New Delhi
1. Dhunna, Mukesh, Marketing Management – Text and Cases, Wisedom Publications, New Delhi

Instructions for External Examiner: The question paper shall be divided in two sections. **Section 'A'** shall comprise of eight short answer type questions from whole of the syllabus carrying two marks each, which shall be compulsory. Answer to each question should not exceed 50 words normally. **Section 'B'** shall comprise 8 questions (2 questions from each unit). The students will be required to attempt four questions selecting one question from each unit. All questions will carry equal marks.

DEPT. OF JOURNALISM AND MASS COMMUNICATION

SEMESTER –III

Open Elective- Introduction to Mass Media

Time allowed: 3 Hours **Total Marks:100**

Theory Marks: 80

Internal Assessment: 20

Note: The question paper will be divided into Five Units carrying equal marks i.e. 16 marks for each question. Each of the First Four Units will contain two questions and the students shall be asked to attempt one question from each unit. Unit Five shall contain eight short answer type questions without any internal choice and it shall be covering the entire syllabus. As such, all question in Unit five shall be compulsory.

Unit 1

1.1 Mass Media: Definition, Meaning & Concept

1.2 Types of Mass Media

1.3 Traditional & Folk Media- Characteristic Features

1.4 Print Media, Electronic Media, New Media- Characteristic Features

Unit 2

2.1 Print Media- Brief History, Evolution from early times

2.2 Print Media in India- Role in freedom struggle, growth of print media after independence

2.3 Important newspapers and magazines of India, noted journalists; current role and importance of print media

2.4 Emergence of Regional Print Media, Challenges before Print Media, Emerging trends of Print Media

Unit 3

3.1 Origin and Development of Radio in India; role and importance of radio as a medium

3.2 A.I.R, Private FM, Community Radio;, Current status of Radio in India

3.3 Origin and Development of Television in India

3.4 Public and Commercial Television; role and importance of Television as a medium; present status of Television industry in India

Unit 4

4.1 Brief History and Development of Cinema in India

4.2 Cinema as a medium if mass communication- role and importance; Emerging trends in Indian Cinema

4.3 New Media- salient features, social media, social sharing to social activism- new media as a medium of mass communication

4.4 Current status of New Media, especially Web Journalism; Emerging trends & challenges

Internal Assessment **Total Marks : 20**

Note : The Break up of 20 marks for Internal Assessment (Theory Paper) is as under :

1. House Test	10 Marks
2. Class Attendance	05 Marks
3. Term Paper/Assignment	05 Marks

LL.M. SECOND SEMESTER EXAMINATION w.e.f. Session 2016-17

Open Elective (Constitutional Law)

PAPER CODE: 16LAWO2

MM: Th 80+IA 20

Time: 3 hours

NOTE FOR EXAMINER/PAPER SETTER

The question paper of each course will be divided into Five sections, each of the First Four Sections of the Question Paper will contain 2 questions respectively from Unit-1 to Unit-4 of the syllabus. The students will be required to attempt one question from each section. Section 5 of the question paper shall contain 8 short answer type questions of 3 marks each(without any choice) covering the entire syllabus. As such Section 5 will be compulsory. The examiner will be free to set the questions in problem forms based on case law.

NOTE FOR STUDENTS(ON QUESTION PAPER)

Attempt four questions from sections 1 to 4, selecting at least one question from each section. These questions shall carry 14 marks each. Section 5 is compulsory and each question in this section shall carry 3 marks.

UNIT-I

Preamble, Citizenship, Definition of State Under Art, 12. Rules of Interpretation under Art. 13
Leading Case: Mohmmad Raza V State of Bombay AIR 1966 , SC 1436

UNIT-II

Right to Equality(Art.14), Special Provision for Weaker Sections of the Society, Reservation Polity, Fundamental Freedoms under Art.19, Freedom of Press.
Leading Case: Indira Sawhney v Union of India, AIR 1993, SC 477

UNIT-III

Protection in respect of conviction of offcence (Act-20), Right to Life and Personal Liberty Article 21), Protection against Arrest and Detention (Art 22), Right against Exploitation (Art-23 & 24), Right to Religion (Art 25-28).
Leading Cases:Maneka Gandhi v Union of India, AIR 1978, SC 597

UNIT-IV

Cultural & Educational Rights of Minorities (Art.29 & 30), Right to Constitutional Remedies (Art, 32), Directive Principles of State Policy, Fundamental Duties.
Leading Case: T.M.A. Pai Foundation V State Karanataka AIR 2003 SC 355

BOOKS RECOMMENDED

Seervai, H.M. : Constitutional Law of India
Hidayatullah, M. : -do-
Tope, T.R. : -do-
Shukla, V.N. : -do-
Jain, M.P. : Constitutional Law
Chander Pal : Centre State Relations and Indian Cooperative Federalism
Chander Pal : State Autonomy in Indian Federation: Emerging Trends
J.N.Pandey : Constitutional Law of India

16LISO2: Information Sources and Literacy

MM: Th 80+IA 20
Time: 3Hrs.

Note
The paper is divided into 4 units. The candidates are required to attempt 5 questions in all selecting 1 question from each unit (out of two internal choices). Question 1 is compulsory consisting of 8 short answer type questions spread over the whole syllabus. All questions carry equal marks.

Objectives

to provide knowledge regarding information sources;
to impart practical knowledge to the students about the evaluation of reference and information sources; and
to make students aware about information literacy and search strategies

Outcomes
Through this course the students will come to know about the various types of information sources in print and electronic form. The students will have knowledge of various types of databases and how to evaluate them. After completion of the course, the students will know the importance of information literacy and various search strategies.

Unit 1:Information Sources

Information sources and types : documentary and non-documentary
Print information sources: primary, secondary, tertiary
Electronic information sources: primary, secondary, tertiary
Books: concept, parts: front matter, body, back matter; types
Journals: concept, types, impact factor, h-index
Theses: concept, parts

Unit 2:Databases

Full text databases: Science Direct, Emerald
Abstracting and indexing databases: Medline
Citational databases: Scopus, Web of Science
Theses databases: NDLTD, Shodhganga
Open access resources: DOAJ, DOAB

Unit 3: Evaluation of Information Sources

Evaluation criteria
Evaluation of following information sources (print and electronic): dictionary: Oxford groups; encyclopedia: International Encyclopedia of Social Science, McGraw Hill Encyclopedia of Science & Technology ; biographical sources: International Who's Who; yearbook: World of Learning ;statistical sources: Census of India
Evaluation of internet resources

Unit 4: Information Literacy

Information literacy: meaning, definition
Information literacy and lifelong learning
Nature of information requirement
Literature search
Search strategies and techniques

Suggested Readings

Eisenberg, Michael. *Information literacy: Essential skills for the information age*. 2nd ed. Westport Publ.: Libraries Unlimited, 2005.

Gates, Jean Key. (1988). *Guide to the use of Libraries and Information Sources* (6thed). New York: McGraw-Hill.

Katz, William A. (2002). *Introduction to Reference Work: Basic Information Services*. *Introduction to Reference Work:* V1. 8thed. New York: McGraw-Hill, 2002.

Katz, William A. (2002). *Introduction to Reference Work: Reference Services and Reference Processes.* V2. 8thed. New York: McGraw-Hill.

Open Electives to be offered by Department of Mathematics

To be offered in3rd Semester					
16MATO4	MATLAB	40	--	60	1:0:2
16MATO3	Statistical Tools using SPSS	50	--	50	2:0:1

16MATO3: Statistical Tools using SPSS

Time: 03 Hours ***Max Marks : T50+P50***
Credits : 2:0:1

Unit – I

Data: Qualitative and Quantitative Data, Cross-Sectional and Time series data, Univariate and Multivariate data. Scales of measurement of Data.
Frequencies, Bar charts, Pie Charts, Line Graphs, histograms, Measures of central tendency, dispersion, Skewness, Kurtosis, Box plots.

Unit – II

Concepts of Linear Correlation and Regression, Multiple Regression, Normality tests, t-tests, Chi Square tests, F-test, One way and Two way ANOVA.

Unit – III

SPSS Data File: Opening a data file in SPSS, SPSS Data Editor, Creating a data file, Editing and Manipulating data, Missing Values, Editing SPSS Output, Copying SPSS output, Printing from SPSS, Importing Data.
Charts and Graphs with SPSS: Frequencies, Bar charts, Pie Charts, Line Graphs, histograms,

Unit – IV

Descriptive Statistics with SPSS: Measures of central tendency, dispersion, Skewness, Kurtosis, Box plots.
Statistical tests using SPSS, Correlation and Regression using SPSS, Factor analysis using SPSS.

Note : The question paper will consist of **five** units. Each of the first four units will contain **two** questions from unit **I , II , III , IV** respectively and the students shall be asked to attempt **one** question from each unit. Unit five will contain **eight to ten** short answer type questions without any internal choice covering the entire syllabus and shall be **compulsory**.

Books Recommended:

1. Kothari, C.R., Research Methodology
2. Gupta, S.L. and Gupta, Hitesh, SPSS for Researchers, International Book House Pvt. Ltd.
3. Field, A., Discovering Statistics using SPSS, SAGE Publications.
4. Gupta, V., SPSS for Beginners, VJ Books Inc.
5. Rajathi, A. and Chandran, P., SPSS for you, MJP Publishers

Part-B (Practical)

Time: 03 Hours ***Max Marks : 50***

There will be a separate practical paper based on the above theory paper. All practicals are required to be done using SPSS.

16MATO4: MATLAB

Time: 03 Hours ***Max Marks : T40+P60***
Credits : 1:0:2

Section - I

Introduction to MATLAB Programming: Basics of MATLAB programming, Anatomy of a program, variables and assignments, data types, operators, working with complex numbers, mathematical operations, functions for input and output, good programming style.

Section - II

Introduction to vectors in Matlab: Defining a Vector, Accessing elements within a vector, Basic operations on vectors, strings, string functions, cell array, creating cell array, Introduction to Matrices in Matlab: Defining Matrices, Matrix functions, Matrix operations, vector functions

Section - III

Loops: for loops, while loops, Branching (conditional statements) - if statement, if else statement, else if statement, Executable files, subroutines, Built in functions and user-defined functions, function handles, function handles in m-files, inline functions.

Section - IV

Data files: Saving and recalling data, saving a session as text, C style read/write, Graphs and plots- Polar plot, plot3, mesh, contour, contourf, Using built-in algorithms: optimization and numerical integration (areas), Root-finding.

Note : The question paper will consist of **five** units. Each of the first four units will contain **two** questions from unit **I , II , III , IV** respectively and the students shall be asked to attempt **one** question from each unit. Unit five will contain **eight to ten** short answer type questions without any internal choice covering the entire syllabus and shall be **compulsory**.

Books Recommended:

1. MATLAB An Introduction With Applications 5ed, Author: Amos Gilat. Publisher: Wiley, ISBN13:. 978-1118629864.
2. Insight Through Computing: A Matlab Introduction to Computational Science and Engineering by C. F. Van Loan and K.-Y. D. Fan. SIAM Publication, 2009, ISBN: 978-0-898716-91-7.
3. MATLAB Programming, Y.Kirani Singh, B.B. Chaudhari, PHI Learning, 2007, ISBN 8120330811, 9788120330818.
4. An Introduction to Matlab, Krister Ahlersten, Bookboon.com, ISBN: 978-87-403-0283-7

M.Sc. Medical Biotechnology Semester -III

Course Title: Principles of Medical Biotechnology II

MM. Th 80 + IA 20 **Course Code: 16MBTO2** **Time: 3h**

NOTE: The examiner is required to set seven questions in all. Question No. 1 will be compulsory and short answer type covering the entire syllabus. The remaining six questions will be set with two questions from each unit. The candidate will be required to attempt Question 1 and four more selecting at-least one from each unit.

Theory

Unit – I

Cloning vectors- Plasmid, cosmid, phagemid,phasmid, bacteriophages YAC, BAC, HAC; Shuttle vectors; Recombinant – production, identification and selection; Restriction endonucleases, Ligases; Hybridization; Linkers and adaptors; DNA Transformation and transfection methods; Cell expression system; Human genome project

Unit – II

PCR and its variant; Blotting- Southern, northern & western; Genomic and cDNA library;; DNA Footprinting ; Gene therapy, Gene knockout, Tissue engineering.

Animal Cell Culture: Introduction and Application of animal cell culture. Equipments, materials, culture vessels for animal cell culture, Primary and established cell line cultures

Unit – III

Basic biology of stem cells; Types & sources of stem cells, Blood cell formation from Bone marrow stem cells, Isolation & characterizations of stem cells, Cancer stem cells, Induced pluripotent stem cells, Stem cell banking, Therapeutic application of stem cells.

Recommended Books

1. R. Lanza, J. Gearhart et al (Ed), Essential of Stem Cell Biology, Elsevier Academic press.

2. R. Lanza, I. Weissman, J. Thomson, and R. Pedersen, Handbook of Stem Cells, TwoVolume, Volume 1-2: Volume 1-Embryonic Stem Cells; Volume 2-Adult & Fetal Stem Cells, 2012, Academic Press.
3. Culture of Animal Cells- A manual of basic techniques by R.I. Freshney
4. Animal Cells Culture and Media, D.C.Darling and S.J.Morgan, 1994. BIOS Scientific Publishers Limited.
5. Gene cloning and DNA analysis – An Introduction (2006) 5th edition, T.A Brown, Blackwell publisher.
6. Essential genes (2006), Benzamin Lewin, Pearson education international.
7. Genome-3 (2007) T.A Brown. Garland science, Taylor & Francis, NewYork.
8. Principles of gene manipulation and Genomics (2006) 7th edition, S.B Primose and R.M Twyman, Blackwell publishing.
9. Principles of Genetic Engineering (2009), Mousumi Debnath, pointer publisher, Jaipur.
10. Molecular Biotechnology-Principles and Applications of Recombinant DNA (2003) 3rd edition, Bernard R Glick and Jack J pasternak. ASM press, Washington.
11. Human Molecular Genetics (2004) 3rd edition, Tom Strachan & Andrew P Read, Garland science.

(SEMESTER-III)

Open Elective: 16MCBO2 : Microbial Technology for Entrepreneurship

Time: 03 Hours
MM. Th 80+IA 20
Time: 2 h
Credits : 3:0:0

Note: The question paper will consist of 9 questions. Students will have to attempt 5 questions in total - Question no. 1 will comprise of short answer questions covering the entire syllabus and will be compulsory. Two questions to be set from each Unit and students will have to attempt one from each Unit.

Unit I

Commercial Microbial Products; Introduction to bioprocess development- upstream development, downstream process, Preservation and improvement of industrially important microorganisms, Strain development by mutagenesis, protoplast fusion and Genetic engineering.

Unit II

Raw materials and media formulation for microbial culture; batch, fed batch and continues mode of bioprocess, Types of Bioreactors and their applications: Stirred tank bioreactor & Specialized bioreactors.

Unit III

Downstream process, Choice of bioprocess plant location; Methods of estimation of Capital Cost and Operational costs of bioprocess plant, Good Lab Practices (GLP) and Good Manufacturing Practices (GMP).

U**nit IV**

Introduction to Bioentrepreneurship; Factors necessary for Entrepreneurship; Attributes in an Entrepreneur; Market Assessments; Managing Technology transfer and Intellectual property in biotechnology in India, Licensing of Biotechnological invention, Funding agencies in India, Basics of Patents- Types of patents; Filing of a patent application.

Suggested readings:

1. Handbook of Bioentrepreneurship by **Patzelt**, Holger, **Brenner**, Thomas (Eds.) Publisher:
2. SpringerBiotechnology. A Textbook of Industrial Microbiology, by W. Crueger and A. Crueger. Publisher: Sinauer Associates.
3. Industrial microbiology by G. Reed, Publishers: CBS
4. Bioprocess Engineering Principles by P. Doran. Publisher: Academic Press.

Biochemical Engineering Fundamentals by J.E. Baily and D.F. Ollis. Publisher: McGraw Hill

M.Sc. Physics Semester III

Open Elective – II

Sources of Energy –II

PAPER CODE: 16PHYO2

Theory Marks: 80
Internal Assessment: 20
Time: 3 hours

Unit I

Bio-mass:

Introduction of biogas, Availability of bio-mass and its conversion theory, classification of biogas plants, principle & working of floating drum plant & fixed dome type plant- advantages & disadvantages. Biogas from plant waste, community biogas plants, utilization of biogas.

Unit II

Ocean Thermal Energy Availability, theory and working principle, performance and limitations.

Wave and Tidal Wave:

Principle, working, performance and limitations.

Unit III

Petroleum and Coal energy

Petroleum, origin, composition, production, extraction, octane number, kerosene, LPG, lubricants natural gas, physical properties and uses of coal, generis of coal, molecular structure, determination of fixed carbon content, coal for generation of electricity, zero emission power plants, coal reserves and mining.

Unit IV

Nuclear Energy

Nucleus and its constituents, charge mass, isotopes, isobars, mass defect, binding energy and nuclear stability, radiation and nuclear reactions.

Nuclear fission, chain reaction, U^{235}, U^{238}, controlled nuclear fission and nuclear reactors, fast breeder reactor, nuclear fusion, condition for nuclear fusion reaction, Hydrogen bomb, Nuclear bomb

Text / References Books:

1. John Twideu and Tony Weir, "Renewal Energy Resources" BSP Publications, 2006
2. M.V.R. Koteswara Rao, "Energy Resources: Conventional & Non-Conventional" BSP Publications, 2006.
3. D.S. Chauhan, "Non-Conventional Energy Resources" New Age International.
4. C.S. Solanki, "Renewal Energy Technologies: A Practical Guide for Beginners" PHI Learning.
5. Peter Auer, "Advances in energy system and Technology" Vol I & II Edited by Academic Press.
6. Raja A.K., "Introduction to Non-Conventional Energy Resources" Scitech Publications.
7. G.D. Rai, "Non-conventional Energy sources" Khanna Publishers

Semester-III **Open Elective**

Paper code 17PUBO2
Environment Protection Administration
w.e.f. 2017-18

Total Credit: 4+0+0 =4
L+T+P
Total Marks = 100
Semester End Exam = 80
Internal Assessment = 20

Note:

The question paper will consist of 5 units containing 9 questions. The students are required to attempt one question from each unit. Question no 9 consisting of eight short answer questions covering entire syllabus, is compulsory.

Unit-I

Environment: Meaning, definition, scope and significance
Environment Ethics
Environment Challenges in India

Unit-II

Environment Protection: Meaning, Definition and Significance.
Environment Protection Act, 1986
Bio-Diversity and its Conservation
Bio-Diversity Conservation Act, 2002

Unit-III

Environment Pollution, Meaning, causes, effects and control mechanism
Types of pollution, Environment Education, Air Pollution (Prevention and Control) Act, 1981
Water Pollution (Prevention and Control) Act, 1974

Unit-IV

Environmental Issues:
People's Participation in Environment Protection
Role of NGO and Panchayats in Environment Protection
Environment Management

Suggested Readings:

1. Murthy,D.B.N. Environmental Awareness & Protection : A Base Book on EVS, New Delhi: Deep & Deep, 2004
2. Radha , S. & A.S. Sankhyan, Environment Challenges of the 21st Century, New Delhi : Deep & Deep, 2004.
3. Tiwari, A.K., Environmental Planning and Management, New Delhi : Deep &

Deep, 2006.
4. Murthy,D.B.N., Environmental Planning and Management, New Delhi : Deep & Deep, 2005
5. Garg, Bansal and Tiwari, Enviornment Pollution & Protection, New Delhi, Deep & Deep, 2006
6. Verma S.B. and S.K. Singh, Environment Protection and Development, New Delhi : Deep & Deep 2005
7. Singh, P.P. & S. Sharma, Teaching of Environemtn, New Delhi: Deep & Deep, 2004
8. Tiwari, K.L. and S.K. Jadhav, Paryavaran Vigian, New Delhi: I.K. International, 2009.
9. Chatterjee, Benimadhab , Environmental Laws: Implementation Problems and Perspectives, New Delhi, Deep & Deep, 2002.
10. Venkat, Aruna , Environmental Law and Policy, New Delhi, PHI Learning, 2011.
11. Upadhayay, Jai Jai Ram , Pryavaran Vidhi, Allahabad, Central Law Agency, 2013.
12. Sengar, Dharmendra S., Environmental Law, New Delhi, PHI, 2012.

13. Tiwari K.L and S.K. Jadhav, Paryavaran Vigian, New Delhi, I.K. Internation, 2009.
14. Ganesamurthy, V.S., Enviornmental Status and Policy in India, New Delhi: New Century Publications, 2011.

Department of Political Science

Semester- III 2017-18

Open Elective: *Natural and Manmade Disaster* 17POL01

Max. Marks: 80
Internal Assessment: 20

Note: The question paper will be divided into five units carrying equal marks i.e. 16 marks. Students shall be asked to attempt one out of two questions from each unit. Unit five shall contain eight short answer type questions without any internal choice and it shall be covering the entire syllabus. As such, all questions in unit five shall be compulsory.

UNIT- I

i. Classification of Disasters; Conceptualizing the interface between environmental degradation and disasters

ii. Natural Disasters I: Earthquakes & Tsunamis; Volcanic Eruptions; Landslides and Avalanches

UNIT- II

iii. Natural Disasters II: Cyclones; Forest-fires; Droughts and Desertification; Floods

UNIT- III

iv. Human Induced Disasters I: Nuclear Disasters; Chemical Disasters; Soil and Water Pollution

UNIT- IV

v. Human Induced Disasters II: Global warming; Biological

Disasters: Epidemics

Essential Readings

1. Ahmed, Shaik Iftikhar (2008). *Disaster Management in the Wake of a Flood*, Twenty First Century Publications, Patiala.
2. Bryant Edwards (2005). Natural Hazards, Cambridge University Press, U.K.
3. Carter, W. Nick (1991). Disaster Management, Asian Development Bank, Manila.
4. Central Water Commission (1987). Flood Atlas of India, CWC, New Delhi.
5. Central Water Commission (1989). Manual of Flood Forecasting, New Delhi.
6. Government of India (1997). Vulnerability Atlas of India, New Delhi.

   Kapur, A. (2010). Vulnerable India: A Geographical Study of Disasters, Sage Publications, New Delhi.
7. Kapur, A. (2005). Disasters in India: Studies of Grim Reality, Rawat Publications, Jaipur.
8. Sahni, Pardeep et al. (eds.) (2002). Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi.

Further Readings:

1. Bilham, R. (2009). The seismic future of cities. Bulletin of Earthquake Engineering, 7, pp. 839-887.

2. Bureau of Indian Standards (2002). Indian Standards: Criteria for Earthquake Resistant Design of Structures, Part I, Fifth Revision.

3. Government of India (1997). Vulnerability Atlas of India (New Delhi: Building Materials and Technology Promotion Council, Ministry of Housing & Urban Poverty Alleviation).

MA 3rd Semester (Open Elective Paper)

Sem	Paper No	Code	Nomenclature of Paper	Contact hours/L +T+P	Marks			Credit
					Theory	I.A	Total	
III	Paper	16SOCO2	Indian Society	4:0:0	80	20	100	3

Scheme of Examination:

It is decided to adopt the new scheme of Choice Based Credit System of examination whereby all the papers have four units comprising of 80 marks and the Internal Assessment component will be of 20 marks in all the Semesters. In the theory paper students will be asked to attempt four questions from the four units selecting at least one question from each unit and the 5th question shall be compulsory which will cover all units in the format of short answer type questions comprising of about 50 to 60 words. Thus, the total marks for all the five questions i.e. four from the units (16x4=64) and the 5th compulsory question of short answer numbering eight of 2 marks each i.e (8x2=16) thus making the total weight age to 80 marks.
The detail of Internal Assessment of 20 marks has been prescribed by the University is given below:-

(a) One Class Test : 10 Marks
(b) One Assignment : 5 Marks
(c) Attendance : 5 Marks

Less than 65%	:	0 Marks
Up to 70%	:	2 Marks
Up to 75%	:	3 Marks
Up to 80%	:	4 Marks
Above 80%	:	5 Marks

M.A.(Sociology)
Semester-III
Open Elective Paper- 16SOCO2
Indian Society

Maximum Marks: 100
Theory: 80
Internal Assessment: 20
Time : 3 Hours

Note:

3. **Nine question would be set in all.**
4. **Question No. fifth shall be based on the entire syllabus and would be compulsory. It would contain eight short answer questions of two marks each.**
5. **There would be two questions (16 marks each) from each of the four units.**
6. **The candidate would be required to attempt four questions (one compulsory and other four questions selecting one from each unit).**

Unit – I

Indian Society: Evolution of Indian Society: Socio- Cultural Dimensions; Unity in Diversity: Cultural, Linguistic, Religious and Tribal.

Unit – II

Social Stratification: Social Differentiation and Stratification. Forms of Stratification: Caste, Class and Gender.

Unit – III

Social Change: Development and Social Change, Processes of Change: Sanskritization,Westernization and globalization.

Unit – IV

Contemporary Issues: Status of Women: Demographic, Social, Cultural, Economic and Political Dimensions; Adverse Sex Ratio: Causes and Consequences.

References:

Ahlawat, S.R and Neerja Ahlawat (2015) (ed.) Crises of Social Transformation in India, Rawat Publication, Delhi

Ahlawat, Neerja (2012) "Political Economy of Haryana's Khaps", "Economic and Political Weekly, Vol - XLVII No. 47-48, December 01.

Ahlawat, Neerja (2013), "Dispensable Daughters and Indispensable Sons: Discrete family Choice", Social Change, 43(3) PP-365-376

Ahuja, Ram (2003) Society in India, Rawat Publications, Delhi

Desai, Neera and Maithreyi Krishna Raj. (1987). Women and Society in India, New Delhi: Ajanta Publishers.

Dube, S.C. (1967). The Indian Village. New Delhi: National Book Trust.
Ghurye, G.S. (1957). Caste and Race in India, Bombay: Popular Book Depot.
Karve, Irawati (1961). Hindu Society: An Interpretation, Poona: Deccan College.
Prabhu, P.H (1979): Hindu Social Organization, Popular Prakashan.
Sharma, K.L. (2011). Indian Social Structure and Change, New Delhi: Rawat Publications. Srinivas, M.N. (1960). India's Villages. Bombay: Asia Publishing House.
Srinivas, M.N. (1970). Social Change in Modern India, Berkeley, California: University Srinivas, M.N. (1991), India: Social Structure, Delhi: Chaman offset Printers.

Optimization Techniques (3rd Semester)

PAPER CODE: 16STAO3

Maximum Marks: 80
Internal Assessment Marks: 20
Time: 3 Hours
Credit: 03

Section –I

Linear Programming Problems: Formulation and their Solution by Simplex and Artificial Variable Techniques. Resolution of Degeneracy in LPP. Duality in LPP: Solution of Primal-Dual Problems by Dual Simplex Method and Economic Interpretation of Duality. Solutions of Integer Programming Problems (IPP).

Section –II

Transportation Problems: Mathematical Formulation and their Optimal Solution. Assignment Problems: Mathematical Formulation and their Solution by Hungarian Assignment Method.

Theory of Games: Characteristic of Games, Minimax (Maximin) Criterion and Optimal Strategy. Solution of Games with (or without) Saddle Point. Solution of mxn Games by Linear Programming Method. Principle of Dominance.

Section-III

Markov Chains: Classification of States and Chains. Higher Transition Probabilities. Elementary Idea of Birth and Death Processes. Queuing Theory: Description of Queuing Problems, Notations, Measures of Effectiveness and Characteristics. Queuing Systems: M/M/1, M/M/C, M/M/1/R, M/G/1 and G/M/1 Models with Waiting Time Distribution and their Steady State Solutions.

Section –IV

Inventory Problems**:** Classification and Cost involved in Inventory Problems. Solution of Deterministic and Probabilistic Inventory Models. Job Sequencing Problems: Processing of N Jobs through Two, Three and M Machines. PERT and CPM Techniques. Labeling Time Estimate and Determination of Critical Path on Network Analysis.

Books Suggested:

1. Gass, S.I. : Linear Programming (Methods and Applications)
2. Kambo, N.S : Mathematical Programming Techniques
3. Hadely,G. : Linear Programming
4 Medhi, J. : Stochastic Processes (New Age International)
5. Donal, Gross & Carl, M. Hariss : Fundamentals of Queuing Theory (Wiley)
6. Kashyap, B.R.K & Chaudhary, M.L. : An Introduction to Queuing Theory (A.A.Publications)
7. Churchman : Introduction to Operations Research (J. Wiley)
8. Sharma, S.D. : Operation Research (Kedar Nath Ram Nath, India)

Note: The examiner is to set the question paper into five units- A, B, C, D & E. In each unit A, B, C& D, he/she has to set two questions of 16 marks each from section I, II, III, & IV respectively and the candidate will attempt one question from each unit. In unit E, there will be 8 short answered questions of 2 marks each, covering the whole syllabus and the candidate has to attempt all the questions.

DEPARTMENT OF ZOOLOGY
M. Sc. ZOOLOGY

Course Title: Wild Life And Conservation

Semester- III

Course no.: 16ZOOO2
MM:T80+IA20

Time: 3 Hr

Note: There shall be seven questions in total. One question will be compulsory (short answer type) covering the entire syllabus and remaining six questions will be set two from each unit. Students are required to attempt question 1 and 4 more selecting at least one from each unit.

Unit-I

Wildlife: Definition, significance and wildlife zones of the world and India, Protected Area Systems, Present status of National PA-Systems. Theory and Practice of Biosphere Reserves of the world: Biosphere Reserves of India. Natural Heritage sites, Wildlife and livelihood; Wildlife and illegal trade & control.

Unit-II

Wildlife Damage, electric fences for wildlife damage control, Basic electric fence design, Trench design, line trapping, Mist netting, Rocket netting Chemical capture: Equipment, Drugs, Plan of operation. Poaching: Its implications, conducting anti-poaching operations.

Unit-III

Wildlife conservation techniques, role of WWF, IUCN, UNEP, Red Data Book; Categories of Endangered Wildlife Species. National Projects: Project Tiger, Project elephant, Project Rhinoceros, Project Crocodiles.

***As per SOE Zoology**

****proposed maximum marks and subject to change in uniformity with other faculties of university**

List of Recommended Books

1. Techniques for wildlife Census in India by W.A. Rogers (A field mannual); Wildlife Institute of India, Dehradun.
2. Wildlife Wealth of India by T.C. Majupuria; Tecpress Services, L.P., 487/42-SOL Wattenslip,Pratunam Bangkok, 10400, Thailand
3. Ali, S. Ripley S.D. Handbook of Birds of India, Pakistan 10-Vols. Oxford University Press, Bombay.
4. The Book of Indian Animals by S.H. Prater, BNHS-Publication, Bombay.
5. Wildlife in India by V.B. Saharia Natraj Publishers, Dehradun.
6. E.P. Gee, The Wildlife of India.