

## 2.9 NEP[2020] FYUP Course Structure 2023

## FYUGP WITH ONE MAJOR AND ONE MINOR DISCIPLINE

SEMESTER	I	II	III	Course Type	IV	V	VI	VII	VIII	Research
Subject Type	CREDIT BREAKUP OF FYUGP WITH ONE MAJOR AND ONE MINOR DISCIPLINE									
Major	4+2	4+2	4+2	CT-3	4+2	4+2	4+2	4+2	4+2	
				CT-2	4+2	4*	4+2	4+2	4+2	
				CT-1	3+1	3+1	3+1	3+1	3+1	3+1
Minor	4+2	4+2	4+2	CT-1	3+1	3+1	3+1	3+1	3+1	3+1
MD	3	3	3							
AEC	3	3	3							
SEC	2+2	2+2	2+2							
Internship-V/ Research-VIII						*2				12
VAC	2+2	2+2								
Total Credits	26	26	22		20	20	20	20	20	20

ID: Inter-Disciplinary, MD: Multi-Disciplinary, AEC: Ability Enhancement Course, SEC: Skill Enhancement Course, VAC: Value Added Course

## FYUGP WITH DOUBLE MAJOR DISCIPLINES

SEMESTER	I	II	III	Course Type	IV	V	VI	VII	VIII	
Subject Type	CREDIT BREAKUP OF FYUGP WITH DOUBLE MAJOR DISCIPLINES									
Major	4+2	4+2	4+2	CT-2	4+2	4	4+2	4+2	4+2	
				CT-1	3+1	3+1	3+1	3+1	3+1	
Minor (ID)	4+2	4+2	4+2	CT-1	3+1	3+1	3+1	3+1	3+1	
				CT-2	4+2	4	4+2	4+2	4+2	
MD	3	3	3							
AEC	3	3	3							
SEC	2+2	2+2	2+2							
Internship-V						2&2				
VAC	2+2	2+2								
Total Credits	26	26	22		20	20	20	20	20	

ID: Inter-Disciplinary, MD: Multi-Disciplinary, AEC: Ability Enhancement Course, SEC: Skill Enhancement Course, VAC: Value Added Course

S No	Discipline/Course	Major	Minor	MD
	Credits/Semester	4+2	4+2	3 Semester
1	Applied Computing - (M)	No	Yes	No
2	Arabic Literature - (M)	No	Yes	Yes
3	Biochemistry - (M)	Yes	Yes	Yes
4	Biotechnology - (M)	Yes	Yes	Yes
5	Botany - (M)	Yes	Yes	Yes
6	Business Administration - (M)	Yes	Yes	Yes
7	Chemistry - (M)	Yes	Yes	Yes
8	Clinical Biochemistry - (M)	Yes	Yes	Yes
9	Commerce - (M)	Yes	Yes	Yes
10	Computer Applications - (M)	Yes	Yes	Yes
11	Disaster Management - (M)	Yes	Yes	Yes
12	Economics - (M)	Yes	Yes	Yes
13	Education - (M)	Yes	Yes	Yes
14	Electronics - (M)	Yes	Yes	Yes
15	English Literature - (M)	Yes	Yes	Yes
16	Environmental Science - (M)	Yes	Yes	Yes
17	Food Science & Technology - (M)	Yes	Yes	Yes
18	General English - (M)	No	Yes	No
19	Geography - (M)	Yes	Yes	Yes
20	Geology - (M)	Yes	Yes	Yes
21	Hindi - (M)	Yes	Yes	Yes
22	History - (M)	Yes	Yes	Yes
23	Indian Music - (M)	Yes	Yes	Yes
24	Islamic Studies - (M)	Yes	Yes	Yes
25	Information Technology - (M)	Yes	Yes	Yes
26	Kashmiri Literature - (M)	No	Yes	Yes
27	Mathematics - (M)	Yes	Yes	Yes
28	MCMP - (M)	Yes	Yes	Yes
29	Media Script Writing - (M)	No	Yes	No
30	Persian Literature - (M)	Yes	Yes	Yes
31	Physics - (M)	Yes	Yes	Yes
32	Political Science - (M)	Yes	Yes	Yes
33	Psychology - (M)	Yes	Yes	Yes
34	Public Administration - (M)	Yes	Yes	Yes
35	Seed Technology - (M)	No	Yes	No
36	Sericulture - (M)	No	Yes	No
37	Social Work - (M)	Yes	Yes	Yes
38	Sociology - (M)	Yes	Yes	Yes
39	Statistics - (M)	Yes	Yes	Yes
40	Urdu Literature - (M)	Yes	Yes	Yes
41	Water Management - (M)	Yes	Yes	Yes
42	Zoology - (M)	Yes	Yes	Yes



## 2.11 AEC/VAC/SEC

**Ability Enhancement Course—AEC Credits- 3 per Course**

Semester-1	Semester-2	Semester-3
Communication Skill	English Language	MIL

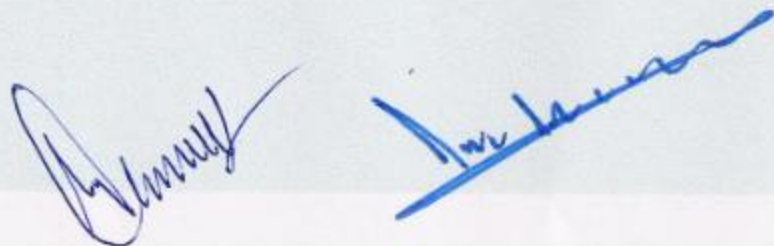
**Modern Indian Languages—MIL Credits- 3 per Course Intake Capacity**

1	Urdu Language	640
2	Kashmiri Language	160
3	Arabic Language	160
4	Persian Language	160
5	Hindi Language	160

**Value Added Course—VAC Credits: 2 per Course**

Semester-1	Semester-2
Environmental Science Education	Digital & Technological Solutions
Health & Wellness	Understanding India

S#	Skill Enhancement Courses— SEC		Eligibility
	Semester—I	Semester—II	
1	Consumer Electronics [Home Appliances]	Office Appliances	Science
2	DM: Emergency Response	Community Based DM	All
3	DFM: Documentary Film Making—I	Documentary Film Making-II	All
4	Geography: Remote Sensing	GIS	Science
5	Indian Music: Harmonium-I	Harmonium-II	All
6	Commerce: Personal Selling & Salesmanship	E-Commerce	All
7	PFV: Handling & Storage of Fruits & Vegetables	Processing & Value Addition of F&V-I	All
8	Physics: Renewable Energy	Computational Physics	Science
9	SPP: Principles of Seed Production	Seed Production in Field, Horticultural & other Crops	Science
10	WDP: Internet Basics & HTML	Java Script & CSS Basics	All
11	WTC: Welding Technology-I	Welding Technology-II	All



**BACHELORS WITH BUSINESS ADMINISTRATION AS MAJOR  
1<sup>st</sup> SEMESTER**

**POM122J: BUSINESS ADMINISTRATION: PRINCIPLES OF MANAGEMENT**

**CREDITS: THEORY: 4; TUTORIAL: 2**

***COURSE OBJECTIVE:** To acquaint the students with the basic principles of management and how the same can be applied to improve the efficiency and effectiveness of an organization in the present dynamic business environment.*

**THEORY (4 CREDITS)**

**UNIT-I**

Management: Basic concepts, Nature and Scope of Management, Managerial Roles, Managerial Roles, Skills and Activities. Evolution of Management thought, Classical, Scientific and Behavioural approach. Functions of Management.

**UNIT-II**

Planning: Basic concepts, Nature, Scope, Objective and Significance of Planning, Elements and Steps of Planning, Span of Control, Line and Staff Relationship. Authority, Delegation, Centralization Vs Decentralization. Organizational Design & Structures: Basic Concepts, types of organizational structure; functional structure, product structure, geographic structure & matrix structure. Virtual structure.

**UNIT-III**

Directing: Effective Directing, Supervision, Motivation, Different Theories of Motivation Maslow, ERG, Herzberg's theories. Concept of Leadership, Theories and Styles, Manager vs. leader, Qualities leader. Power & politics: basic concepts.

**UNIT-IV**

Controlling: Basic Concepts, Elements of Managerial Control, Management Control Techniques, Effective Control Systems. Forward, backward and concurrent control. Budget as a control tool. Efficiency & effectiveness.

**TUTORIAL / PRACTICAL (2 CREDITS)**

**It will cover Industry visit,** Management Games to understand Individual behaviour and group behaviour, Games for Leadership Development, Role playing, Seminars and Group Discussions and Brainstorming on Contemporary Management Issues.

Evaluation tutorials/ practical shall be done by the examiner(s) as per University norms/ notifications.

**Suggested Readings:**

1. Gilbert: Principles of Management, McGraw Hill.
2. Koontz & Heinz Weihrich: Essential of Management, McGraw Hill.
3. Luthans Fred: Organisational Behaviour, Tata McGraw Hill.
4. Robbins Stephen P: Organisational Behaviour, Pearson.
5. Management by Robbins, Coulter, Fernandez Pearson Publishing House.



**SEMESTER 1<sup>st</sup>**  
**MAJOR COURSE**

**EVSI22J: ENVIRONMENTAL SCIENCE (ENVIRONMENT AND ECOLOGY)**

**(4+2 CREDITS)**

*Paper outcome: This paper is designed to introduce the basic concepts of Environment and Ecology leading to better understanding of inter-connections of Environmental Science as a discipline.*

**THEORY (4 CREDITS)**

**UNIT 1: BASICS OF ENVIRONMENT**

Environmental science: Scope and importance, Components of environment: Atmosphere, Lithosphere, Hydrosphere, Biosphere (structure and function), Brief account of Cryosphere and Anthroposphere (Built Environment).

**UNIT 2: POPULATION AND COMMUNITY**

Concept of population, Population growth (Density dependent and density independent factors), Survivorship curves and age structure, Biotic potential and carrying capacity (r and k strategists), Population interactions: Mutualism, Protocooperation, Commensalism, Competition, Herbivory, Predation, Parasitism, Community: Concept and characteristics, Ecological succession.

**UNIT 3: ECOSYSTEMS**

Ecosystem: Concept, Organization and significance, Types of ecosystems, Food chains, Food webs and trophic levels, Ecological pyramids, Energy flow in ecosystems, Ecosystem productivity, Decomposition, Biogeochemical cycles: Carbon, Nitrogen, Phosphorus and Sulphur.

**UNIT 4: HUMAN ECOLOGY**

Global and regional human population growth, Theories of human population growth (Malthusian and neo-malthusian), Drivers of human population change, Growth curves and population projections, Earth's carrying capacity and ecological footprint, Brief account of Anthropocene.

**LABORATORY COURSE (2 CREDITS)**

1. Study of water flow and discharge from any water body
2. Study of meteorological parameters (temperature, humidity, rainfall)
3. Study of the soil profile in any ecosystem
4. Study of vegetation in a particular ecosystem (lake, forest, agricultural, grassland etc)
5. Study of fauna in a particular ecosystem (lake, forest, agricultural, grassland etc)
6. Study of biomass and carbon stock of herbaceous vegetation in any ecosystem (lake, forest, agricultural, grassland etc)
7. Case study of approaches used by any country or region for human population management
8. Field /Environmental visit to understand various environmental components

**BIBLIOGRAPHY**

1. Basics of Environmental Science: Michael Allaby
2. Environmental Sciences (system and solutions): Mckinney and Schoch
3. Environmental Science: Botkin, Keller
4. Environmental Science: Tyler Miller
5. Essentials of Geology: Chernicoff, Fox, Venkatakrishnan
6. Concepts of Ecology: E.J. Kormondy
7. Environment Principles & Applications: Chris Park.
8. Fundamentals of Ecology: E.P. Odum
9. Population Ecology: P.S. Aaradhana
10. Ecology and Environment: P.D.Sharma
11. Ecology, Environment and Resource Conservation, Singh, J.S., Singh, S.P. and Gupta, S.R.
12. Environmental Chemistry, De, A.K.



**SEMESTER 1<sup>st</sup>**  
**MAJOR COURSE**

**GLY122J: GEOLOGY (FUNDAMENTALS OF GEOLOGY)**

**CREDITS: (4+2)**

*Objective/Expected learning outcomes:*

*The study of this course will strengthen student's knowledge with respect to understanding the essentials of the structural dynamics of the earth. The students will understand the origin of our solar system and planets, including earth. The students will understand the different surface processes and geomorphological features and their development. Besides, studying the basics of mineralogy will help the students in understanding and building the overall knowledge in Geology.*

**THEORY (4 CREDITS)**

**UNIT-1**

Introduction to the science of geology: Definition, branches, scope and importance, History of Geology origin and evolution of Geological thoughts; Modern theories about the origin of the solar system; Origin of the Earth exogenous and endogenous process. Relation with other branches of sciences; Role of physics, chemistry, and paleobiology in the development of ideas about the earth. Role of Physics in crystallography, gravity, geomagnetism, isostasy, earthquakes and microscopy. Role of Chemistry in chemical bonds, crystal chemistry, solution chemistry, chemical energetic, introduction to fossils.

**UNIT -2**

Fundamental concepts: Catastrophism, uniformitarianism, Davis cycle of erosion, and base level of erosion. Weathering: definition and types, agents of weathering. Epeirogenesis and orogenesis. Mountains and types. Volcanoes: types, distribution, and eruptive features. Glaciers: Definition and types, snowline, glacial movements, and crevasses. Geological work of glaciers: Erosion and deposition. Aeolian processes: erosional and depositional features. Geological work of river: erosional and depositional features. Drainage patterns. Karst topography: Surface and sub-surface features. Structural landforms: Definition and types, Inversion of topography. Climate and landforms. Soils: Soil formation, Soil profiles. Oceans: Topography of seafloor. – Continental shelves, slope, abyssal plains, Ocean ridges, submarine valleys, canyons, deep-sea trenches, and guyots. Oceanic erosion and deposition. Coral reefs and types.

**UNIT -3**

Introduction to rocks and minerals: Rocks as natural mineral aggregates; types of rocks: igneous rocks; sedimentary rocks; metamorphic rocks. Preliminary knowledge about the most common rock-forming and economic minerals. Structure of earth: physical properties. Geology as the history of Earth: How the rocks record history, Geological Time Scale, Mineralogy and the texture, Structures, introduction to paleoclimate and paleogeography, Surface relief of the earth, Topography of sea floor. Various Geospheres.

**UNIT -4**

Mineralogy: Definition, scope, and classification of silicate minerals and ore-forming minerals. Scalar and vector properties of minerals. Moho's scale of hardness. Physical properties and mode of occurrence: Quartz, Feldspar, Mica, Amphibole, Pyroxene, Olivine, Garnet, Chlorite, and Carbonate. Optical Mineralogy: Polarizing microscope, mechanism of polarization and interference of light, use of accessory plates. Elements of optics, isotropic medium, anisotropic medium, refractive index, Snell's law of critical angle, Optical indicatrix: isotropic, uniaxial, and biaxial. Pleochroism and Birefringence. Optical properties of minerals under plane-polarized and cross-polarized light: Forms, cleavage, fractures and parting, refractive index and relief, Becke line and its use.

## **PRACTICAL (2 CREDITS)**

### **UNIT-5**

#### **Field work (7 days in a semester)**

**Field Work:** Study of landforms, erosional and depositional features. Handling of Clinometer and Brunton compass for measuring dip and strike, and plotting of field data on toposheets.

### **UNIT -6**

**Mineralogy:** Study of the physical properties of important rock-forming minerals as included in the theory paper. Study of optical properties of important rock-forming minerals as included in the theory paper.

#### **SUGGESTED READINGS:**

- Berry & Mason, 1988: Mineralogy. CBS Pub.  
Burbank, D. W. and Anderson, R.S., 2001: Tectonic Geomorphology Blackwell Sciences  
Dexter Perkin: Minerals in Thin Sections  
Gribble, D. D., 1988: Rutley's Elements of Mineralogy, DBS Publications.  
Holmes, A., 1996: Principles of Physical Geology, EUBS, Chapman.  
Judson, S. and Kaufman, M. E., 1990: Physical Geology, Prentice Hall.  
Kerr, P. F., 1984. Optical Mineralogy.  
Lutgens, F. K. and Tarbuck, E. J., 1998: Essentials of Geology, Prentice Hall.  
Phillips, Wm. R. and Griffen, D.T., 1986: Optical Mineralogy. CBS Edition.  
Press, F. and Seiver, R., 1989: The Earth, W. H. Freeman.  
Putnis, A., 2001: Introduction to mineral Science. Cambridge University Press.  
Read, H. H., 1986: Rutleys Elements of Mineralogy.  
Richard, V. G., 1997: Dana's new Mineralogy. John Wiley.  
Ritter, D. F., 1978: Process Geomorphology. Wm. C. Brown Publishers,  
Tarbuck, E. J. and Lutgens, F. K., 1997: Earth Science, Prentice Hall.  
Terry, G. W., 1958: Principles of Petrology, Mathuen.  
Vishwas, S. K and Gupta, A., 2001: Introduction to Geomorphology Orient Longman.  
S.N. Mathur, [www.GSI](http://www.GSI.govt.in). Govt. in (Field Manual of GSI).



## SEMESTER 1<sup>st</sup>

### MAJOR / MINOR COURSE

#### PLS122J: POLITICAL SCIENCE (INTRODUCTION TO POLITICAL THEORY)

*(Credits: Theory = 04 + Tutorials = 02 Credits)*

**COURSE DESCRIPTION:** The course is introductory in nature and shall help students to understand the basic concepts in Political Theory. The conceptual understanding will smoothen their path towards the more advanced theoretical debates in Political Theory and Political Philosophy. Furthermore, the Field-work/Internship offers an opportunity to understand the working and nature of political institutions and processes.

#### **LEARNING OUTCOME:**

1. To introduce students to basic conceptual categories
2. To make them familiar with the advanced theoretical debate in Political Theory & Political Philosophy
3. To relate concepts to daily political practice
4. To bridge gap between theory and practice of Political Science
5. To enhance skill and job potential of students.

#### **LECTURES: 04 CREDITS**

##### **UNIT I INTRODUCTION**

- 1.1 Understanding politics
- 1.2 Perspectives on politics: Liberal, Marxist and Communitarian
- 1.3 Normative and Scientific Debates in politics
- 1.4 The Idea of political: Liberal vs Conservative

##### **UNIT II POLITICAL THEORY AND STATE**

- 2.1 What is Political Theory? Why do we need it?
- 2.2 State: Theories of its Origin
- 2.3 Distinction between State, Civil Society and Nation
- 2.4 Perspectives on State: Liberal, Marxist and Feminist

##### **UNIT III CONCEPTS-I**

- 3.1 Liberty: Negative vs Positive
- 3.2 Equality: Liberal, Socialists, Libertarian
- 3.3 Justice: Procedural and Distributive
- 3.4 Citizenship: Liberal and Communitarian theories

##### **UNIT IV CONCEPTS-II**

- 4.1 Democracy: Procedural and Substantive
- 4.2 Rights: Universalism and particularism
- 4.3 Obligations: Grounds and Limitations
- 4.4 Power and Legitimacy: Gramsci and Althusser

#### **TUTORIALS: 2 CREDITS (FIELD STUDY)**

##### **WORKING OF DEMOCRACY AT LOCAL LEVELS (PANCHAYAT/MUNICIPALITY)**

- a. Working of Local-self Government (Field Study Report)
- b. Internship with Local Body Representatives
- a. Impact Assessment of Affirmative action on selected communities (Field study)



**BACHELORS WITH WATER MANAGEMENT AS MAJOR (CT – I)**  
**SEMESTER 1<sup>st</sup>**

**MAJOR COURSE**

**WMG122J: WATER MANAGEMENT - INTRODUCTION TO WATER**

**(4+2 CREDITS)**

*Course objective and outcome: The objective of this course is to impart the knowledge of hydrology that deals with the occurrence, distribution, movement and properties of water on the earth.*

*Paper outcome: This paper is to offer a better insight on basics of water ranging from importance, characteristics distribution and consumption patterns.*

**THEORY (4 CREDITS)**

**UNIT I: PROPERTIES OF WATER**

Origin of water on earth, Unique properties of water (Polarity, Cohesion, Density, Surface Tension, Viscosity, Heat capacity, Boiling and freezing points, Temperature, Taste, Odour, Colour), Importance of water.

**UNIT II: WATER RESOURCES DISTRIBUTION**

Water as a resource, Concept of valuing water, Types of water resources, Inland water distribution and importance, Ground water distribution and importance, Cryosphere: Distribution and importance, Marine waters: Distribution and importance, Water resources of J&K (River systems and glaciers).

**UNIT III: WATER AND HUMAN CIVILIZATION**

Importance of water in human civilization (Mesopotamian and Indus), Water catastrophes: Historical perspective and consequences, Water infrastructure and tools (Ancient, Medieval and modern).

**UNIT IV: WATER USE AND AVAILABILITY**

Distribution of water, Availability and consumption patterns in domestic, industrial, and agricultural sectors, Concept of water stress and scarcity, Water footprint, Domestic water demand and consumption in urban and rural India, Sustainable Development Goal 6 (SDG)

**LABORATORY COURSE (CREDITS-2)**

1. Evaluation of per capita domestic water consumption pattern
2. Calculation of personal water footprint
3. Visit to any archeological/relevant site for demonstration of water infrastructure
4. Determination of water quality on basis of odor and color
5. Perception of stakeholders regarding drinking water quality available in the institution/College
6. Estimation of water temperature of different ecosystems
7. Questionnaire survey on water demands by various sectors (Domestic, Agriculture, Industry)
8. Visit to a any nearby drinking water supply scheme/source

**SUGGESTED READINGS:**

Bansil, P.C. 2004. *Water Management in India*. Concept Publishing Company, India.

Brebbia, C.A. 2013. *Water Resources Management VII*. WIT Press.

CEA. 2011. *Water Resources and Power Maps of India*. Central Board of Irrigation & Power.

Grumbine, R.E. and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science* 339: 36-37.

Loucks, D.P., Stedinger, J.R. & Haith, D. A. 1981. *Water Resource Systems Planning and Analysis*. Englewood Cliffs, NJ, Prentice Hall.

Mays, L.W. 2006. *Water Resources Sustainability*. The McGraw-Hill Publications.

Schward and Zhang. 2003. *Fundamentals of Groundwater*. John Wiley and Sons.

Souvorov, A.V. 1999. *Marine Ecogonomics: The Ecology and Economics of Marine Natural Resource Management*. Elsevier Publications.

Vickers, A. 2001. *Handbook of Water Use and Conservation*. Water Plow Press.



## PROGRAMME: BACHLOR OF SCIENCES (GENERAL)

## SUBJECT: GEOLOGY

## COURSE DISTRIBUTION IN DIFFERENT SEMESTERS FOR THE BATCH 2020 AND ONWARDS:

SEM	COURSE CODE	COURSE TYPE	TITLE OF COURSE	CREDITS		
				THEORY	PRACTICAL	TUTORIAL
I	GL120C	DSC-1	Fundamentals of Geology	4	2	-
II	GL220C	DSC-2	Petrology	4	2	-
III	GL320C	DSC-3	Sedimentary and Economic Geology	4	2	-
IV	GL420C	DSC-4	Geochemistry and Geophysics	4	2	-
V	GL520DA	DSE-1A	Structural Geology	4	2	-
	GL520DB	DSE-1B	Climate Change: Past, Present, and Future	4	2	-
	GL520DC	DSE-1C	Oceanography and Marine Geology	4	2	-
	GL520DD	DSE-1D	Isotope Geology and Geochemistry	4	2	-
VI	GL620DA	DSE-2A	Paleontology & Stratigraphy	4	2	-
	GL620DB	DSE-2B	Remote Sensing and Societal Geology	4	2	-
	GL620DC	DSE-2C	Mining and Mineral Exploration	4	2	-
	GL620DD	DSE-2D	Research Project in Geosciences (Dissertation)	0	0	6

BACHLOR OF SCIENCE 1<sup>st</sup> SEMESTER

## DISCIPLINE SPECIFIC COURSE -1 (CORE-1)

## GL120C: GEOLOGY: FUNDAMENTALS OF GEOLOGY

CREDITS: THEORY-4; PRACTICAL-2

MAXIMUM MARKS: THEORY-60, PRACTICAL-30

MINIMUM MARKS: THEORY-24, PRACTICAL-12

*Objective/Expected learning outcomes:*

The study of this course will strengthen students' knowledge with respect to understanding the essentials of the structural dynamics of the earth. The students will understand the origin of our solar system and planets, including earth. Besides, studying the basics of mineralogy and crystallography will help the students in understanding and building the overall knowledge in Geology.

**THEORY (4 CREDITS; 60 HOURS)****UNIT-1 (15 HOURS)**

Introduction to the science of geology: Definition, branches, scope and importance, History of Geology; Modern theories about the origin of solar system; Evolution of continents and oceans

Relation with other branches of sciences; Role of physics, chemistry and paleobiology in the development of ideas about earth. Role of Physics in crystallography, gravity, geomagnetism, isostasy, earthquakes and microscopy. Role of Chemistry in chemical bonds, crystal chemistry, solution chemistry, chemical energetics.

**UNIT-2 (15 HOURS)**

Introduction to rocks and minerals: Rocks as natural mineral aggregates; types of rocks: igneous rocks; sedimentary rocks; metamorphic rocks.

Preliminary knowledge about the most common rock forming and economic minerals Physical properties and chemical composition of the earth and earth's crust.

Geology as the history of Earth: How the rocks record history – (a) Fossils (b) Mineralogy and the texture; (c) Structures; (d) Paleogeography, Paleoclimate. Surface relief of the earth. Exogenous and endogenous process. Various Geospheres: Atmosphere; origin and evolution; structure, composition and energy balance; Heat budget; Ocean; origin and evolution; ocean circulation and its role in global climate;

**UNIT-3 (15 HOURS)**

Crystallography: Introduction to crystallography, geometrical nature of the order of crystals. Translation vectors, planar and space lattices. Normal class of crystal systems.



Morphology of crystals: Face, edge and solid angle, interfacial angle and Law of constancy of interfacial angles. Axial system and axial ratios. Parameter system of Weiss, Miller indices. Law of Rationality of indices. Crystal growth and twinning: Growth of crystals from solutions and from a melt under controlled conditions, crystal growth in open fractures, solution cavities and vesicles.

Twining in crystals: Types, causes and laws

Crystal forms: Crystallized, crystalline, cryptocrystalline and amorphous. Crystal habit: elongated, tabular, flattened and equant. Form of crystalline and cryptocrystalline aggregates—types, examples and use in mineral identification.

Crystal chemistry: Dimorphism, polymorphism, pseudomorphism, isomorphism and solid solution.

#### UNIT-4 (15 HOURS)

Mineralogy: definition, scope and classification of silicate minerals and ore forming (oxide/ sulphide) minerals. Scalar and vector properties of minerals; Moho's scale of hardness.

Physical properties and the mode of occurrence of the following groups of minerals: Quartz, Feldspar, Mica, Amphibole, Pyroxene, Olivine, Garnet, Chlorite, and Carbonate.

Mineral optics: Elements of optics. Optics of isotropic medium – refractive index, Snell's law of critical angle, anisotropic media.

Polarization and interference of light. Polaroid, polarizing microscope- construction and use. Use of accessory plates. Pleochroism and Birefringence.

Optical indicatrix: isotropic, uniaxial and biaxial indicatrix.

Optical properties of minerals under plane-polarized and cross-polarized light: Forms, cleavage, fractures and parting, refractive index and relief, Becke line and its use.

#### PRACTICAL (2 CREDITS: 60 HOURS)

MAXIMUM MARKS: 30, MINIMUM MARKS: 12

**Field Work:** Study of landforms, erosional and depositional features. Handling of Clinometer and Brunton compass for Measuring dip and strike, and plotting of field data on toposheets.

**Crystallography & Mineralogy:** Demonstration of space lattice, model-Galena, Fluorite, Sphalerite, Pyrite and Calcite.

Clinographic projection of the following crystals form: Cube, Octahedron, Zircon, Beryl, Calcite and Gypsum. Study of the physical properties of important rock-forming minerals as included in the theory paper. Study of optical properties of important rock forming minerals as included in the theory paper.

Clinographic projections of the following crystals forms: Cube, Octahedron, Zircon Beryl, calcite and Gypsum.

#### SUGGESTED READINGS:

Holmes, A., 1996: *Principles of Physical Geology*, EUBS, Chapman.

Judson, S. and Kaufman, M. E., 1990: *Physical Geology*, Prentice Hall.

Press, F. and Seiver, R., 1989: *The Earth*, W. H. Freeman.

Terry, G. W., 1958: *Principles of Petrology*, Mathuen.

Tarbuck, E. J. and Lutgens, F. K., 1997: *Earth Science*, Prentice Hall. Lutgens, F. K.

and Tarbuck, E. J., 1998: *Essentials of Geology*, Prentice Hall. Gribble, D. D., 1988:

*Rutley's Elements of Mineralogy*, DBS Publications.

Kerr, P. F., 1984. *Optical Mineralogy*.

Phillips, Wm, R. and Griffen, D.T., 1986: *Optical Mineralogy*. CBS Edition.

Putnis, A., 2001: *Introduction to mineral Science*. Cambridge University Press. Putnis, A., 1992: *Introduction to mineral Science*. Cambridge University Press.

Richard, V. G., 1997: *Dana's new Mineralogy*. John Wiley.

## **B.Sc. 1<sup>st</sup> Semester (Sericulture)**

### **SEMESTER- 1**

#### **Core course: Paper-I**

#### **General Sericulture and Mulberry production**

**(Credits: Theory-04, Practical-02)**

#### **THEORY**

##### **Unit 1: INTRODUCTION**

1. Sericulture: Definition, history and present status.
2. Silkworms: Types of silkworms, life cycle and their food plants.
3. Prospects and problems of sericulture
4. Role of women in sericulture

##### **Unit 2: MULBERRY CULTIVATION-I**

1. Morphology, Taxonomy of mulberry and popular mulberry cultivars; *Morus alba*, *Morus indica*, *Morus cerata*.
2. Anatomy of root, stem and leaf.
3. Economical importance of mulberry other uses and medicinal value.
4. Common weeds of mulberry –their effects on mulberry productivity

##### **Unit 3: MULBERRY CULTIVATION-II**

1. Propagation of mulberry- Sexual and asexual propagation techniques.
2. Pruning : Bottom pruning, middle pruning and repeated pruning
3. Use of growth regulators in mulberry propagation.
4. Leaf yield : Estimation of leaf yield per unit area-acre/hectare

##### **Unit 4: ESTABLISHMENT AND MANAGEMENT OF MULBERRY GARDEN**

1. Land preparation: Soil, leveling and ploughing.
2. Plantation methods : Row and pit systems
3. Irrigation: Drip irrigation, sprinkler irrigation, flood irrigation, weeding
4. Manuring: Organic, inorganic and biofertilizer

#### **PRACTICALS**

##### **GENERAL SERICULTURE-MAPS AND RECORDS:**

- a) Study of different life stages of *Bombyx mori* L
- b) Preparation of a map showing extension of sericulture in the world.
- c) Preparation of a map showing extension of sericulture in India.
- d) Graphical representation of cocoon and silk production by various silkworms in India.
- e) Graphical representation of earning from indigenous market and export of silk goods.
- f) Visit to various sericulture centers of state and southern India.

##### **MORICULTURE:**

- a) Soil sampling and analysis of pH and moisture content.
- b) External morphology of root, stem and leaf.
- c) Anatomy of root, stem and leaf.
- d) Methods of propagation by cutting and grafting
- e) Farm implements
- f) Determination of water holding capacity



**3rd SEMESTER  
BIOTECHNOLOGY AS MAJOR  
BTG322J: BIOTECHNOLOGY: MOLECULAR CELL BIOLOGY**

**Theory: 4, Practicals: 2**

**Objectives:** Cell being the basic unit of life, this course is aimed to provide students an insight about basic cellular structure, functioning of cell organelles and cell cycle.

**Expected Learning Outcomes:** Students will be able to;

- Draw the organization of cell membrane and distinguish between different types of transport across it.
- Analyze the functioning of Endoplasmic reticulum, Golgi complex and associated vesicle transport.
- Describe the structure and functioning of nucleus and other organelles.
- Gain an understanding of the functions performed by the cytoskeleton and the significance of cell-cell interactions and distinguish between different phases of the cell cycle.

**UNIT I      15 lectures**

Introduction to cell (animal and plant cell). Cell Membrane – structure and function. Membrane organization (Fluid Mosaic Model). Transport across membrane – Active and Passive transport ( $\text{Ca}^{++}$ -ATPase,  $\text{Na}^+/\text{K}^+$ ATPase,  $\text{Na}^+$ linked,  $\text{Na}^+$ -linked Antiporter,  $\text{Ca}^{++}$ from cardiac muscle, symporters, diffusion and facilitated diffusion).

**UNIT II      15 lectures**

Endoplasmic reticulum, Golgi complex and Lysosomes: Structure and function. Role in Protein sorting and transport. Mechanism of vesicular transport (COP I, COP II and Clathrin coated vesicles). Endocytosis, Pinocytosis and Phagocytosis.

**Unit III      15 lectures**

Mitochondria, chloroplast, ribosomes, vacuoles and peroxisomes: Structure and function. Structure and organization of nucleus, organization of nuclear pore. Structure and functions of microtubules, microfilaments and intermediate filaments.

**UNIT IV      15 lectures**

Extra cellular matrix and cell-matrix interactions. Cell-cell interactions: Adherence junctions, tight junctions, gap junctions, desmosomes, hemidesmosomes, focal adhesions and plasmodesmata. Cell cycle (mitosis and meiosis), regulation of cell cycle. Apoptosis - brief idea.

**Practicals:**

1. Studying of different cellular organelles with animations and micrographs.
2. Studying the different stages of mitosis by preparing slides of onion root tip.
3. Staining of cells.
4. Karyotyping.
5. Observations on the permeability of Plasma membrane- effect of Isotonic, Hypotonic and Hypertonic solutions on Mammalian R.B.Cs or any other cell.
6. Field trip/subject tour/report.

**Books:**

1. Molecular Biology of the Cell by Alberts, B Taylor and Francis, New York. USA.
2. Cell and Molecular Biology: Concepts and Experiments by G. Karp, John Wiley & Sons.
3. Cell and Molecular Biology by De Robertis and De Robertis Lippincott Williams and Wilkins, Philadelphia.
4. The Cell: A Molecular Approach by Cooper, G.M. and Hausman, ASM Press.
5. The World of the Cell by Becker, Kleinsmith, Hardin. J. and Berton, Pearson Benjamin Cummings Publishing.

# **BACHELLORS WITH BOTANY AS MAJOR**

## **Semester 3<sup>rd</sup>**

### **BOT322J: BOTANY: MORPHOLOGY OF ANGIOSPERMS**

(CREDITS: THEORY:04; PRACTICALS:02)

(CREDITS: THEORY:04; PRACTICALS:02)

*Objectives: To impart knowledge to the students about morphology of angiosperms and to acquaint them about the importance of morphology in understanding Botany.*

#### **THEORY(4CREDITS)**

**Unit I:**Introduction to plant morphology; plant habit, habitat, life forms; root: types and modifications;stem: types, habit, modifications and branching patterns, bark and its types

**Unit II:**Leaves: parts of leaf; structural types, attachment, venation, phyllotaxy, stipules, leaf shapes, leaf margin,leaf base, leaf apex, venation

**Unit III:**Inflorescence types;parts of flower, flower attachment and symmetry, perianth and its types, aestivation; androecium:stamen attachment, position, number and fusion; anther parts, types and attachment; nectaries.

**Unit IV:**Gynoecium: parts of carpel, carpel fusion and number; ovary attachment and position; placentation and its types; fruit and types;seedsand their types

#### **PRACTICAL EXERCISES (2 CREDIT)**

1. To study different types of leaves.
2. To study different types of inflorescences.
3. To study different flower types.
4. To study different types of fruits.
5. To study different types of seeds.
6. To study different types of root and stem modifications.
7. To study different types of trichomes and placentation under microscope.
8. **Conduct of two botanical trips to study natural flora**
9. Preparation of herbarium with minimum 40 sheets.

#### **Books recommended**

1. Plant Systematics (third edition, 2019) by Michael G. Simpson. ELSEVIER
2. Plant Systematics (fourth edition, 2021) by Gurcaharan Singh. CBS Publishers and Distributors, New Delhi
3. Plant Systematics (2021) by A K Pandey and S. Kasana. Jaya Publishing House, New Delhi



**Bachelors with Geography as Major**  
**3<sup>rd</sup> Semester**

**GGY322J: Geography: Geographical Thought**

**Credits: Theory=4**

**Practical=2**

**Unit-I**

1. Changing Nature of Geography
2. Fundamental Concepts in Geography: Spatial Process and Pattern, Areal Differentiation, Spatial Organization
3. Approaches in Geography- Positivism, Pragmatism, Humanistic & Behaviouralism,
4. Dualism in Geography- Physical vs. Human, General vs. Regional, Ideographic vs. Nomothetic
5. Dichotomies in Geography- Environmental Determinism, Possibilism, Neo-determinism, Environmentalism

**Unit-II**

1. Paradigms in Geography: Modernism & Post Modernism
2. Quantitative Revolution and its Impact
3. Impact of Darwin's Theory on Development of Geography
4. Foundation of Scientific Geography
5. Development of Geography in India

**Unit-III**

1. Contribution of Phoenicians in Geography
2. Contribution of Greeks
3. Contribution of Romans
4. Dark Age in Geography
5. Contribution of Arabs

**Unit-IV**

Major Schools of Geographical Thought-

1. German- Ratzel & Alfred Hettner
2. French- Vidal de la Blache & Jean Brunhes
3. British- Meckinder & Stamp
4. American- W.M Davis & E. Churchill Semple,
5. Soviet Union- V.V. Dokuchaiev & Voeikov

**Practical**

**Unit-V**

1. Quantitative Techniques and their Relevance in Geography
2. Discrete and Continuous Data, Population and Samples
3. Sources and Collection of Geographical Data
4. Scales of Measurement- Nominal, Ordinal, Interval, Ratio
5. Sampling: Significance and Methods

**Unit-VI**

1. Measures of Central Tendency- Mean, Median, Mode, Partition Values
2. Measures of Dispersion- Mean Deviation, Standard Deviation, Variance and Coefficient of Variation
3. Correlation Analysis- Scatter Diagram and Karl Pearson's Method
4. Regression: Linear
5. Hypothesis Testing: Chi-square Test
6. **Field Trip within Kashmir Valley**

**Bachelors with History as Major**  
**3<sup>rd</sup> Semester**

**HST322J: History: HISTORY OF MODERN INDIA Credits: THEORY-4, TUTORIAL: 2**  
**THEORY 4 Credits: 60 HOURS**

**Course Overview:**

This course offers a comprehensive exploration of the history of modern India, covering the period from the inception of British rule in India till its demise in 1947. It examines the different historical processes that shaped the politico-economic and socio-cultural structures/ aspects of life during the colonial period and helps in developing among the learners a nuanced understanding of the functioning and impact of colonialism. How the British empire was reared and sustained and what were the different ways and methods through which the colonized responded to colonialism are critically analysed to broaden the historical imagination of the learners. Through well thought out tutorial and assignments an attempt is made to take the learners out of the classroom settings to promote experiential learning, appreciate the value of heritage and gather history from ground.

**Course Learning Outcomes:**

After successful completion of the course the learners are expected to:

- a. Develop proper understanding of the historical processes and dynamics that led to the establishment of British rule in India
- b. Understand the nature and purpose of British rule in India
- c. Develop a nuanced understanding of the different events and episodes in Modern India history by locating them [events/ episodes] in a space-time context.
- d. Appreciate the contribution of masses and leaders in the struggle for freedom

**UNIT I**

- I. Foundation of British rule: Battle of Plassey; Battle of Buxar
- II. Expansion of British Empire: Subsidiary Alliance and Doctrine of Lapse
- III. Consolidation of British Empire: Orientalism and Utilitarianism

**UNIT II**

- I. Economic Impact of British Rule
- II. Growth of Modern Education-Macaulay's Minute and Woods Dispatch
- III. Socio-Religious Reform Movements-BrahmoSamaj, Aligrah Movement and Arya Samaj

**UNIT III**

- I. Revolt of 1857-Causes, Nature and Significance
- II. Indian National Congress-Role of Moderates and Extremists
- III. Muslim League- Foundation and Role
- IV. Gandhian Era: Non-Cooperation and Civil Disobedience Movement

**UNIT IV**

- I. Major Constitutional Developments [ Acts of 1909, 1919 & 1935]: Salient Features
- II. Second World War and Indian Politics-Crips Mission and Quit India Movement
- III. Cabinet Mission and Mountbatten Plan
- IV. Freedom and Partition: Debate

**TUTORIALS (2 CREDITS; 30 HOURS)**

**TUTORIAL I:**

- I. Debates/Group discussions on select themes relevant to the course
- II. Biographical essay on any of the freedom fighters or social reformers of Modern India.

**TUTORIAL II:**

- I. Debates/ Group discussions on any course relevant documentary/book/report of historical importance



## II. Guided visit to Archives and Report writing

### Selected Readings

- B.L. Grover, Advanced History of Modern India
- Thomas Metcalf, Ideologies of the Raj, 1997, Cambridge University Press, Cambridge
- B. Metcalf and T. Metcalf, Concise History of Modern India, 2001, Cambridge University Press, Cambridge.
- Sumit Sarkar, Modern Times (1880-1950's), 2014, Orient Blackswan, New Delhi
- Ishita Banerjee-Dube, A History of Modern India, 2014, CUP, India
- Seema Alavi, ed. 2002, *The Eighteenth Century in India*. New Delhi: Oxford University Press.
- Shekhar Bandyopadhyay, 2004, *From Plassey to Partition and After*. Orient Longman.
- Sugata Bose and Ayesha Jalal, 2004. *Modern South Asia*. Oxford University Press..
- Bipan Chandra, et. al, 1989. *India's Struggle for Independence*, New Delhi: Penguin Books India.
- Kenneth W Jones, 1994, *Socio-Religious Reform Movements in British India*, Cambridge: Cambridge University Press.

## **BACHELORS WITH GEOLOGY AS MAJOR**

### **3<sup>rd</sup> SEMESTER**

**CREDITS: THEORY: 4, PRACTICAL: 2**

#### **GLY322J: GEOLOGY \_ SEDIMENTOLOGY**

##### *Objective/Expected learning outcomes*

*Upon studying this course, the students will gain an understanding of the processes involved in the formation of sedimentary rocks, their textures, structures, classifications and their importance. They will also be able to identify primary and secondary sedimentary structures and their depositional environments. Upon completion of this course, students will be able to identify sedimentary rocks and their depositional environments with stratigraphic sequence aspects.*

##### **UNIT -1 (15 HOURS)**

Introduction to sedimentology. Origin of sediments. Grain size, concept and scale. The process involved in the formation of sedimentary rocks: erosion, transportation, deposition, and lithification. Sedimentary Textures, structures and environment. Primary and syn-sedimentary structures

##### **UNIT -2 (15 HOURS)**

Basic Hydraulics: sediment transport mechanism, Fluid flow: flow regime, laminar and turbulent flow. Mass flow types and deposits. Particle entrainment, transport and deposition. Paleocurrent analysis: data acquisition, methodology, different palaeocurrent patterns.

##### **UNIT -3 (15 HOURS)**

Siliciclastic rocks: components and classification(s) of conglomerates, sandstones, mudrocks. General introduction to carbonate rocks, BIF, chert; Components and classifications of limestone, dolomites and dolomitisation.

##### **UNIT -4 (15 HOURS)**

The elementary idea on sedimentary facies and environment. Classification of sedimentary facies. Facies models for glacier, meandering, fluvial, deltaic, and shelf depositional settings. Diagenesis, Concepts of Diagenesis, Stages of diagenesis, Compaction and cementation.

##### **PRACTICAL (2 CREDITS: 60 HOURS)**

Identification of sedimentary structures in hand specimens. Statistical analysis of particle size distribution. Paleocurrent analysis. Petrographic study of clastic and non-clastic rocks in thin sections. **Field visit for identification of various sedimentary structures.**

##### **BOOKS RECOMMENDED**

Allen, J.R.L. (1985). Principles of Physical Sedimentology. George Allen and Unwin, London. Prothero, D. R. and Schwab, F. (2004). Sedimentary geology. Macmillan.

Tucker, M. E. (2001). Sedimentary Petrology, Third Edition Blackwell Science.

Collinson, J. D. and Thompson, D. B. (1988). Sedimentary structures. Unwin- Hyman, London. Nichols, G. (2009). Sedimentology and Stratigraphy. Second Edition. Wiley Blackwell.

Folk, R. L. (1974). Petrology of Sedimentary Rock. Hemphill Publishing Company, Austin, Texas.



# BACHELORS WITH BOTANY AS MAJOR

## Semester 4<sup>th</sup>

### BOT422J1 BOTANY \_ PLANT TAXONOMY

(CREDITS: THEORY: 03; PRACTICALS: 01)

**Objectives:** To give students understanding about the concept, components and scope of plant taxonomy, classification and identification of plants, importance of herbaria and botanical gardens, and to learn about principles and rules of nomenclature.

**Theory = 60 lectures**

#### UNIT I: Plant Taxonomy and Classifications

Components, aims and phases; types of classification - artificial, natural and evolutionary; phenetics: principles and methods; cladistics: concept, terms and methods; classification systems - Bentham and Hooker (up to series), Angiosperm Phylogeny Group (AGP-IV) (up to order level).

#### UNIT II: Taxonomic Characters and Institutions

Morphological characters (vegetative and reproductive); Role of anatomical, embryological, cytological, palynological, phytochemical and molecular characters (elementary idea); Herbaria: purpose, preparation and functions, index herbariorum; major herbaria of world and India, virtual herbarium; Botanical garden: criteria and uses, important botanical gardens of world and India;

#### UNIT III: Identification and Nomenclature

Taxonomic literature: flora, monograph, manual, field guides; Taxonomic keys (indented, bracketed and numbered), DNA barcoding (an elementary idea); Scientific names, principles of nomenclature, rules of nomenclature (taxa and ranks, author citation, names of hybrids and cultivated plants), typification (concept and types); Biocode and Phylocode (brief idea).

#### Practical exercises

- i. Preparation of herbaria of types of leaves and inflorescences
- ii. Study of different types of flowers.
- iii. Construction of dichotomous identification keys
- iv. Study of the following families: Liliaceae (*Hemerocallis* / *Tulipa*); Poaceae (*Avena* / *Poa*); Ranunculaceae (*Ranunculus* / *Consolida*); Fabaceae (*Trifolium* / *Robinia*); Rosaceae (*Rosa* / *Fragaria*); Asteraceae, (*Helianthus* / *Taraxacum*); Solanaceae (*Solanum* / *Datura*); Apiaceae (*Daucus* / *Scandix*); Lamiaceae (*Salvia* / *Nepeta*)
- v. Mounting of a properly dried and pressed specimen of 50 wild plants with herbarium label (to be submitted in the record book).
- vi. Two single-day botanical trip to a natural area.

#### Suggested Readings

1. Pandey, AK and Kasana, S. (2021) *Plant Systematics* (1<sup>st</sup> edition). Jaya Publishing House, New Delhi.
2. Singh, G. (2021) *Plant Systematics: An Integrated Approach* (4<sup>th</sup> edition). CRC Press, India
3. Simpson, MG (2010). *Plant Systematics* (2<sup>nd</sup> edition). Elsevier, California, USA.
4. Judd, WS et al (2016). *Plant Systematics: A Phylogenetic Approach* (4<sup>th</sup> edition). Sinauer Associates, Inc. Sunderland, USA.
5. Stuessy, TF (2009) *Plant Taxonomy* (2<sup>nd</sup> edition). Columbia University Press. New York

## FIN422J1: FINANCE (COMMERCE): BUSINESS ECONOMICS

Business Economics Semester-IV	Course Code:FIN422J1: Nature of Course: Major
Credits: (3+1=4)	Term end Examination: 75 Tutorials: 25 Total Marks: 100

### Course Description:

This course is designed to make students acquaint with the application of economics in business firms to take decisions regarding understanding and forecasting consumer demand, optimization firm's production, and pricing decision in various kinds of markets.

### Course Objectives:

- 1. To make students understand the basic concepts and application of economics in business organizations.*
- 2. To make students comprehend how firms optimize their production process.*
- 3. To acquaint students regarding complexities of pricing decisions under various forms of the market.*

### Course Outcome

The students are expected to have a clear grasp regarding the applications of economic concepts, techniques and methods in business organizations and enhance their decision making capabilities as potential managers.

### UNIT – I

Meaning Nature and Scope of Managerial Economics. Uses and limitations. Firm: Nature, Objectives & Rational. The Concept of Economic Profit. Economics & Decision Making. Production Function and Cost Analysis: Concept of production function. Law of Variable Proportions. Law of returns to scale Properties of Cob- Douglas and CEs production functions. Cost minimizing input choice. Short-run and Long-run cost function- traditional and modern approach.

### UNIT – II

Pricing in Perfect Competition. Characteristics & Key Assumptions of Perfect Competition. The Equilibrium Price. Price-Output Decisions in Short-Run: Total Revenue-Total Cost Approach & Marginal Revenue-Marginal Cost Approach. Losses & Shut-Down Decision. Profit-Maximizing Output in Long-run.



Pricing in Monopoly. Characteristics of Monopoly. Price-output Decision in Short-Run. Price-Output Decision in Long-Run. Technical Inefficiency & Rent Seeking.

### UNIT-III

Pricing in Oligopoly: Rivalry & Mutual Independence. Price Rigidity: The Kinked Demand Curve Model. Interdependence: The Cournot Model. Special Pricing Strategies: Price Leadership, Cartels & Collusion. Non-Price Competition. Barriers to Entry in the Market.

Monopolistic Competition: Characteristics & Key Assumptions. Price-Output Decision in Short-Run. Price-Output Decision in Long-run.

### Tutorials

*Apart from the individual attention being given to the students, Tutorials shall include the following:*

- A. Case Studies individually or in groups*
- B. Group Discussions on subject specific current issues/developments*
- C. Assignments*
- D. Project Work & Viva-Voice*
- E. Field Visits & Reports*
- F. Practicals wherever applicable*

### Suggested Readings:

- 1. Raj Kumar and Kuldip Gupta, Managerial Economics, UDH Publishers and Distributors (P) Ltd.*
- 2. M.L.Jhingan and J.K. Stephen, Managerial Economics, Vrinda Publications (P) Ltd.*
- 3. L. C. Gupta, Managerial Economics, Himaliya Publishing House.*
- 4. S. L. Gupta and D. D. Chaturvedi, Business Economics, International Book House.*
- 5. Datt and Sundharam, Indian Economy, S. Chand.*
- 6. Varshney, R. L. and Maheshwari K. L., Managerial Economics, Sultan Chand.*
- 7. Jeol Dean, Managerial Economics, Prentice Hall of India.*

**Note: Latest editions of text books may be used.**

**BACHELORS WITH ENVIRONMENTAL SCIENCE AS MAJOR (CT-1)**

**4<sup>th</sup> SEMESTER**

**EVS422J1 ENVIRONMENTAL SCIENCE \_ HUMAN AND ENVIRONMENT**

**CREDITS: (THEORY-3, PRACTICAL -1)**

*Course outcome: This course is designed to introduce students with a comprehensive conceptual, theoretical and empirical background between social systems and environment. The course explores important perspectives like environmental education, human cognition and behaviour, psychology, urban stress, Eco-philosophies, ethics and politics and policy. The students will be able to understand the social roots of ecological problems, and to unveil the social responses to the environmental crisis. The course also discusses the environmental history and the rise of environmentalism and environmental organizations.*

**THEORY (3 CREDITS: 45 HOURS)**

**UNIT I: ENVIRONMENTAL EDUCATION**

Environmental education: aims, objectives and principles, Environmental protection and religious teachings, Environmental literacy and activism, Environmental ethics, Environmental policy and public attitude

**UNIT II: ENVIRONMENTAL PSYCHOLOGY AND SOCIOLOGY**

Environment psychology: concept and theory, Influence of environment on human cognition and behaviour, Urban environmental stress, Eco-philosophies: deep, social and feminist, Science, policy and society interface

**UNIT III: ENVIRONMENTALISM**

Environmentalism: concept and history, Environmental organizations (WWF, UNEP, IUCN, WHO), Environmental justice, The monetization frontier, Environmental politics

**PRACTICALS: (1 CREDIT; 30 HOURS)**

1. Formulation of questionnaire for the assessment of environmental education among the people.
2. Assessing the impacts of economic development on human lives.
3. Visit to marginalized localities for environmental education and environmental awareness.
4. Preparing a list of projects taken by WWF in India

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# Bachelors with Food Science and Technology as Major

## 4<sup>th</sup> semester

### **FST422J1: PRINCIPLES AND METHODS OF PROCESSING**

**CREDITS: THEORY-3 PRACTICAL - 1      THEORY (4 CREDITS): 60 HOURS**

#### **Objectives/Expected Learning**

- To familiarize students with the basic concepts and techniques of principles and processing methods for preservation of food

#### **UNIT- 1(15 HOURS)**

- Status of Indian food industry–Exports scenario of fruits, vegetables, spices, meat and their processed products
- Classification of foods on the basis of shelf life, pH, origin
- Principles of food preservation
- Preservation by high temperature: Pasteurization, sterilization and canning, concept of Thermal death time, D-value and Z-value
- Calculation based on heat balance
- Preservation by low temperature: Refrigeration; refrigeration systems. Freezing process–slow and fast freezing, types of freezers and their advantages and disadvantages. Storage and thawing of frozen food

#### **UNIT- 2 (15 HOURS)**

- Preservation by reducing water activity of foods: Evaporation, concentration, drying and dehydration
- Membrane processing–Types of membranes, advantages, equipments, applications and effect on foods
- Calculation based on mass balance
- Extrusion–Importance of extrusion, types of extruders and extruded products
- Intermediate moisture (IM) foods, principles, characteristics, advantages of IM foods, problems in developing new IM foods
- Hurdle Technology and its importance in food industry

#### **UNIT- 3 (15 HOURS)**

- Microwave processing–Difference between microwave and infrared energy, dielectric constant, relaxation time, equipment and applications
- Minimally processed foods–Preservation and packaging of minimally processed foods
- Irradiation–Mechanism, dosimetry, equipment, effect of irradiation on micro-organisms and food. Safety and wholesomeness of irradiated foods
- Fermentation–Mechanism involved in food preservation and factors affecting the food fermentation
- Preservation by synthetic chemicals–Benzoate, sorbate, propionate, sulphur dioxide, anti-oxidants and natural agents.

#### **PRACTICALS (1 CREDITS: 30 HOURS)**

- Demonstration of different types of driers
- Demonstration of canning line
- Demonstration of extrusion line
- Demonstration of heat exchangers and freezers
- Demonstration of cold storage/refrigerated storage
- **Industrial/plant visit**

#### **References:**

1. Fellows.P. (2022). Food Processing Technology. Woodhead Publishing
2. Potter, N.N. (2013). Food Science. Springer Science & Business Media.
3. Stewart (2012). Introduction to Food Science and Technology, Elsevier
4. M. Shafiur Rahman (2020). Handbook of Food Preservation. CRC Press 2020
5. Gustavo V. Barbosa-Canovas, Maria S. Tapia, M. Pilar Cano (2004). Novel Food Processing Technologies, CRC Press.



## BACHELORS WITH GEOGRAPHY AS MAJOR

### 4<sup>th</sup> Semester

GGY422J1: Geography: Geomorphology Credits: Theory=3, Practical=1

#### Credit-I

1. Nature and Scope of Geomorphology
2. Development of Geomorphology: European and American Schools
3. Principles of Geomorphology: Uniformitarianism and Neo-catastrophism
4. Concept of Time and Space
5. Concept of Dynamic Equilibrium

#### Credit-II

1. Models in Geomorphology: Natural, Physical and General System
2. Geological Time Scale
3. Theories of Isostasy: Pratt and Airy
4. Mass Movement: Controlling Factors and Types
4. Vulcanicity and Earthquake

#### Credit-III

1. Evolution of Landforms
2. Landforms: Types and Factors Controlling Landforms Development
3. Theories and Process of Slope Development
4. Cycle of Erosion: W.M. Davis and W. Penck
5. Geomorphic Agents and Landforms: Fluvial, Aeolian, Glacial, Karst and Coastal

#### Practical

#### Credit-IV

1. Extraction and Interpretation of Geomorphic Information from Topographical Maps
2. Preparation of Contour Map from Toposheet
3. Wentworth Method of Slope Analysis and Hypsometric Curve
4. Drainage Morphometry: Delineation of Watershed, Stream Ordering, Mean Stream Length and Drainage Density
5. Field Trip within Kashmir Valley

## BACHELORS WITH GEOLOGY AS MAJOR

### 4<sup>th</sup> SEMESTER

CREDITS: THEORY: 3, PRACTICAL: 1

#### GLY422J1: GEOLOGY \_ PALEONTOLOGY AND STRATIGRAPHY

##### *Objectives and Expected learning outcomes*

*The study of Paleontology and Stratigraphy encompasses the aspects of the age of the earth, the chronological arrangement of rocks, and the appearance and evolution of life through geologic time. The concepts of stratigraphy, correlation, and paleontology would enable the students to understand the changes that occurred in the history of the earth and relate them to their field observations and also, to understand the framework of the stratigraphy of India. The students will be exposed to the principles of stratigraphy including order of superposition.*

##### UNIT -1 (15 HOURS)

Paleontology: Origin and evolution of life through ages; Geological time scale; Preliminary idea about faunal succession. Fossils, their characters, conditions necessary for fossilization; types of preservation and occurrence. Application of Paleontology. Evolution of Man, Horse & Elephant.

##### UNIT -2 (15 HOURS)

Morphological characters, geological, geographical and stratigraphic distribution of the following: (1) Brachiopoda (2) Bivalvia (3) Gastropoda (4) Cephalopoda (5) Graptoloida (6) Anthozoa (7) Echinoidea (8) Trilobita. Elementary concept of vertebrate Paleontology with special reference to Siwalik. Introduction to Paleobotany with special reference to Gondwana plant fossils. Microfossils and their application. Introduction to Palynology and its applications.

##### UNIT -3 (15 HOURS)

Stratigraphy: Introduction, nomenclature and Principles. Stratigraphic correlation. A brief introduction to Precambrian rocks of India; Dharwar, Aravalli, Cuddapah, Vindhyan and Himalaya with special emphasis on the classification, distribution, lithology and economic deposits. Stratigraphy of Phanerozoic rocks with reference to the lithology and fossil content. Paleozoic succession of Kashmir, Triassic of Spiti, Jurassic of Kutch, Cretaceous of Tiruchirapalli. Stratigraphy of Siwalik and Karewa of Kashmir.

##### PRACTICAL (1 CREDIT: 30 HOURS)

Study of morphological characters of the selected genera- Brachiopoda, Bivalvia, Gastropoda, Cephalopoda, Trilobita.

Study of soil profile of any specific area in the field (2 days).

##### Books Recommended

- Arnold, C. A., 1947: An introduction to Paleobotany. McGraw - Hill Book Co.  
Bignot, G., 1985: Elements of Micropaleontology. Graham and Trotman.  
Brasier, M. D., 1980: Microfossils. George Allen & Unwin.  
Kumar, R., 1998: Fundamentals of Historical Geology and Stratigraphy. Wiley Eastern Limited.  
Sengupta, S., 1997: Introduction to Sedimentology. Oxford-IBH.  
Shork&Twenholf, 1987: Principles of invertebrate Paleontology. CBS Pub., N. Delhi.  
Weller, J. M., 1960: Stratigraphy Principles & Practice. Harper & Row Pub.



# BACHELORS WITH HISTORY AS MAJOR

## SEMESTER 4<sup>th</sup>

**HST422J1: History: History of Ancient Kashmir**

**Credits: Theory-03, Tutorial: 01**

### **Course Overview:**

This course intends to familiarize the learners with the history of Ancient Kashmir. It attempts to explore the archaeology and history of Kashmir from the stone ages up to the 12<sup>th</sup> century CE. The learner will be acquainted with the various stone-age cultures, kingdoms and empires of ancient Kashmir. Moreover, the relations Kashmir shared with its neighbouring areas is also an integral part of this course. In nutshell, this course intends to familiarise the learners with a basic understanding of the past of Kashmir.

### **Learning Outcomes:**

After successful completion of the course the learners are expected to:

- Understand the significance of various categories of sources for writing the history of ancient Kashmir
- Develop an understanding of the origin and growth of various cultures, civilizations, kingdoms and empires of ancient Kashmir.
- Know about the nature of relations between Kashmir and the neighbouring regions

#### **Unit-I**

- Sources: A Brief Survey
- Pre-Historic Kashmir: Paleolithic and Neolithic Cultures
- Indo-Greeks and Kushanas: Impact

#### **UNIT-II**

- Kashmir under Huns
- Karkotas, Utpalas and Loharas: Political and Administrative Developments
- Early Medieval Economy: Agriculture, Crafts and Trade

#### **UNIT-III**

- Kashmir as a Seat of Learning
- Position and Contribution of Women
- Religious Traditions: Naga, Buddhist and Trika Sivaism

### **TUTORIALS (1 CREDITS)**

**Tutorial:**

- Debates/Group discussions on select themes relevant to the course
- Guided Heritage Walk: Visit and Report Writing on any of the prominent Ancient sites/ Monuments.**

### **Selected Readings:**

- R. C. Agrawal, (1998). *Kashmir and its Monumental Glory*. New Delhi: Aryan Books International.
- P.N.K. Banzai, (1962 (rep. 1973). *A History of Kashmir*. (2nd ed.). New Delhi: Metropolitan Book Co.
- M.A. Wani&Aman Ashraf, (2017), *Prehistory of Kashmir*, Oriental Publishing House, Srinagar.
- M.A. Wani&Aman Ashraf, (2023), *The Making of Early Kashmir: Intellectual Networks and Identity Formation*, Routledge, India.
- A. A Bandey, (2009 ). *Prehistoric Kashmir*. New Delhi: Dilpreet Publishing House.
- S.C. Ray, 1970, *Early History and Culture of Kashmir*, Munshiram Manoharlal, New Delhi.
- Krishna Mohan, 1981, *Early Medieval History of Kashmir*, MeharchandLachmandas Pub. New Delhi.
- R. C Kak, (1933 (reprint 2002). *Ancient Monuments of Kashmir*. Srinagar: Gulshan Publishers.
- S. L. Shali, (1993). *Kashmir : History and Archaeology Through the Ages*. Delhi: Indus Publishing Company.
- M. A Stein, (1900 (reprint 1961). *Kalhana's Rajatarangini*. Delhi: Motilal Banarsidass.
- V.N. Drabu, *Kashmir Polity (600-1200 AD)*, Bahri Publications, New Delhi.

**BA / BSc 5th SEMESTER**  
**DISCIPLINE SPECIFIC ELECTIVES (DSEs)**  
**OPTION-I**

**GG516D1: GEOGRAPHY OF TOURISM**

**CREDITS: THEORY: 4, PRACTICAL: 2**

**Marks: 60**

**THEORY (4 CREDITS)**

**Credit-I**

- 1) Definition and Scope of Tourism Geography
- 2) Components of Tourism
- 3) Geographical Attributes of Tourism
- 4) Butlers Theory of Tourism Development

**Credit-II**

- 1) Types and Forms of Tourism
- 2) Concept of Carrying Capacity
- 3) Sustainable Tourism
- 4) Environmental Impacts of Tourism

**Credit-III**

- 1) Characteristics of Indian Tourism
- 2) National Tourism Policy
- 3) Regional Dimension of Tourist Attraction
- 4) Problems and Prospects of Indian Tourism

**Credit-IV**

- 1) Significance and Potential of Tourism in J&K.
- 2) Tourist Flow and Distribution Pattern
- 3) Pilgrimage Tourism & Adventure Tourism in Jammu and Kashmir
- 4) Problems and Prospects of Tourism in J&K

**PRACTICAL (2 CREDITS)**

**TOURISM GEOGRAPHY      Maximum Marks = 30**

**Credit-V**

- |  |                |
|--|----------------|
| 1. Determination of Tourist Potential Sites through Toposheets         | ( 8 Exercises) |
| 2. Mapping of Tourist Nodes  | (8 Exercises)  |
| 3. Tourist Information System (Site Information and Route Information) | (8 Exercises)  |

**Credit-VI**

- |   |               |
|---|---------------|
| 1. Generation of Tourist Data                     | (8 Exercises) |
| 2. Field Based Tourist Perception Studies         | (8 Exercises) |
| 3. Analysis of Tourism Impacts and Report Writing | (8 Exercises) |

**Suggested Readings:**

1. S. N. Singh, Geography, of Tourism and Recreation, New Delhi, 1954.
2. S. C. Chandra, Geography of Tourism. Rawat Publications, New Delhi 2002.
3. P.C. Sinha, Eco-tourism and Mass tourism. Allahabad 2005.
4. M. Simith and Nichola Macleod, Key Concepts in Tourist studies. 2010
5. B.S. Badan, Tourism in India, Mumbai, 1998.
6. A.C Singh & P.S. Rana, "Tourism Geography, Patna, 2006.



## **BACHLOR OF SCIENCE (GEOLOGY)**

### **5<sup>th</sup> SEMESTER**

#### **DISCIPLINE SPECIFIC ELECTIVE**

#### **GL521DA: STRUCTURAL GEOLOGY/PLATE TECTONICS**

**CREDITS: THEORY-4, PRACTICAL-2**

**THEORY (4 CEDITs: 60 HOURS)**

**MAXIMUM MARKS: 60, MINIMUM MARKS: 24**

#### *Objective/Expected learning outcomes:*

*The course deals with geological structures resulting from the action of these forces on rocks. The student will gain knowledge of the geometry of the rock structures, understand the mechanism of the evolution of rock structures and its application in the field. The students learn the skills of identifying different structure and measurements using Brunton compass. This is fundamental to geological mapping. This course also helps to know how to use structures and help students appreciate the dynamic nature of the Earth lithosphere. Learn how to read geologic maps and solvesimple map problems using strike and preparations of cross sections.*

#### **UNIT -1 (15 HOURS)**

Basic concepts of field geology: Maps–definition, topographic and geological maps. Dip and strike of stratified rocks, True dip, apparent dip, plunge and pitch of linear structures. Outcrop patterns. True thickness and vertical thickness. Width of the outcrop, relation between true thickness and the width of outcrop. Criteria for distinction between normal and overturned sequences: ripple marks, cross bedding, graded bedding, mud cracks, rain-imprints, Pillow lava, vesicular tops of lava beds, Relationship of cleavage with bedding, Paleontological methods.

#### **UNIT -2 (15 HOURS)**

Folds: Definition and classification (geometrical); fold parameters/components. Unconformities: Definition, types of unconformities. Criteria for recognition of unconformities. Concordant pluton: sills, laccoliths, lopoliths, and phacoliths. Discordant pluton: dykes, volcanic vents, ring dykes. Joints- Morphology and classification (Geometrical). Foliation: Definition and classification; Schistosity, gneissosity, slaty cleavage. Lineation: Definition and classification, slickenside, mineral lineation Cleavage/ bedding intersections, pucker lineation, pitch and swell, boudinage, quartz roding and mullion.

#### **UNIT -3 (15 HOURS)**

Faults: Definition, terminology and classification (geometrical). Criteria for recognition of faults: discontinuity of structures, repetition and omission of strata, features characteristic of fault plane: slickenside, gouge, fault breccias, mylonites, silicification and mineralization, differences in sedimentary facies. Physiographic criteria: scraps, triangular facets. Offset streams. Mechanical principles: Stress; definition of force and stress. Normal and shear stress. Basic concept of stress ellipse. Strain definition and computation of changes in line length. Basic concept of strain ellipse.

#### **UNIT -4 (15 Hours)**

Important concepts about Earth dynamics: outline description of Contraction, Expansion, Plate tectonic models. Plate tectonics - basic concepts and definitions, types of plate margins, important characters of plate margins. Mechanism of plate movement; Mantle plumes vis-à-vis island chains. Plate tectonics in relation to the distribution of seismic, volcanic and island arc belts. Plate tectonic models for the origin of mountain belts: Ocean-ocean, ocean-continent, Continent-Continent types of convergent boundaries. Northward movement of the Indian Plate and the origin and evolution of the Himalayas and its thrust belts. Seismicity of the Indian subcontinent

**PRACTICAL (2 CREDITS: 60 HOURS)**

**MAXIMUM MARKS: 30, MINIMUM MARKS: 12**

**Study of contours and landforms;** Strike, true dip and Apparent dip problems; Measurement of thickness and width of outcrops; Completion of outcrops in geological maps; and drawing of profiles and study of geological maps.

**Suggested Readings:**

Billings, M.P., (1972) Structural Geology. Prentice Hall.

Condie, K. C., 1997: Plate Tectonics and Crustal Evolution, Butterworth & Heinemann.

Cox, A., 1996: Plate Tectonics. Blackwell Science.

Davis, G.R., (1984) Structural Geology of Rocks and Region. John Wiley

Hills, E.S., (1963) Elements of Structural Geology. Farrold and Sons, London.

Jain, A.K., (2014) An introduction to structural geology. Text Book series in Geological Sciences for Graduate Students. Geological Society of India, Bangalore.

Keary, P. and Vine, F. J., 2000: Global Tectonics, Blackwell Science.

Ramsay, J.G. (1967) Folding and fracturing of rocks. McGraw-Hill, New York

Singh, R. P., (1995) Structural Geology: A Practical Approach. Ganga Kaveri Publ., Varanasi

Subramanian, V., 2001: Text Book on Environmental Science, Narosa International.



**BACHELOR OF ARTS 5<sup>th</sup> SEMESTER  
DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)**

**OPTION - II**

**HS520DB: HISTORY: THEMES IN CULTURAL AND RELIGIOUS TRADITIONS OF KASHMIR**

Credits: Theory-4, Tutorial: 02

Hours: 60+30=90

**Theory: (4 Credits: 60 hours; Maximum Marks: 60; Minimum Marks: 24)**

**Objectives/ Expected Learning Outcomes:**

- A) Create much needed awareness about literary, religious and architectural heritage of Kashmir
- B) Expose students to variegated sources of history writing from literary to architectural sources.
- C) Inculcate a sense of preservation and appreciation of rich repositories of knowledge and testimonies of literary and religious heritage of Kashmir.

*The course highlights and brings forth the otherwise neglected literary, religious, architectural and cultural heritage of Kashmir. The course is expected to cultivate a sense of preservation and spread the knowledge in respect of heritage of Valley. The paper also enunciates role of religions and religious movements in promotion of a sense of cultural inclusivism, tolerance of dissent and unity in diversity. The appreciation of rich legacy of heritage as a potential source of history will guide the students to pursue the subject further and stimulate the interest of student community the responsible and informed citizens of tomorrow.*

*After undergoing the course students are expected to:*

- A) Analyze and appreciate the historical value of literary and cultural heritage
- B) Study and situate religion in proper context and elucidate the teachings of various religions to inculcate a sense of appreciation of human values.
- C) To augment the heritage for bringing forth the un-narrated and untapped aspects of rich history of Kashmir.

**Unit I: Literary Tradition:**

- I. Sanskrit Tradition: Nilmatapurana; Rajatarangini of Kalhana
- II. Persian Tariekh: Waqiat-i- Kashmir of Azam Deedmari; Tariekh-i-Hassan of Hassan Shah Khoihami

**Unit II Architectural Tradition:**

- I. Stone Architecture: Martand and Parihaspora- Main Features
- II. Wooden Architecture: Khankah-i-Moulla -Main Features
- III. Garden Architecture: Shalimar Garden

**Unit III: Religious Traditions of Kashmir-I**

- I. Naga Worship in Kashmir
- II. Buddhism in Kashmir
- III. Kashmiri Shaivism

**Unit IV Religious Traditions of Kashmir-II**

- I. Conversion to Islam-Debate
- II. Sufism in Kashmir: Major Silsilas
- III. Rishi Movement of Kashmir: Main Proponents and Centres.

**TUTORIAL (2 CREDITS; 30 MARKS)**

**Tutorial-I:** Reviewing/Report writing on excerpts from any Sanskrit or Persian literary text mentioned in the course.

**Tutorial-II:** Site visit and report writing of any nearby Sufi/Rishi shrine, highlighting its importance for the local populace.

**SUGGESTED READINGS:**

- Aggarwal, R. C. (1998) Kashmir and its Monumental Glory, New Delhi, Aryan Books
- Bamzai, P. N. (1973) A History of Kashmir (2<sup>nd</sup>ed), New Delhi, Metropolitan Books
- Banday A. A. (2009) Prehistoric Kashmir: New Delhi Dilpreet Publishers
- Basu, Arabinda, *Kashmiri Saivism* in *The Cultural Heritage of India*, Calcutta, 1937.
- Bhandarkar, R. G. *Vaisnavism, Saivism and Minor Religious Systems*, New-Delhi, 2000
- Chatteji, J.C. *Kashmir Saivism*, Chandigarh, 1981.
- Dwivedi, R. C. *Kashmiri Saivism and Tantric Buddhism*. " Proceedings of the 26<sup>th</sup> International Congress of Orientalises, 1969.
- Shali, S. L. (1993) Kashmir: History and Archaeology through the Ages, Delhi Indus Publishers

**SUPPLEMENTARY READINGS:**

- Ganhar, J. N. And Ganhar, P. N., *Buddhism in Kashmir and Ladakh*, New-Delhi, 1956.
- Madan, T. N., *Religious Ideology and Social Structure: The Muslims and Hindus of Kashmir*". In Imtiyaz Ahmad (ed.) *Ritual and Religion among Muslims in India*, New Delhi, 1981.



**B. Sc. 5<sup>th</sup> SEMESTER**  
**DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)**  
**OPTION-I**

**STH516D1A: SEED TECHNOLOGY - SEED LEGISLATION AND CERTIFICATION**

Credits: Theory-4, Practical-2

**THEORY: LECTURES: 60**

**UNIT-I**

Historical development of Seed Industry in India; Seed quality: concept and factors affecting seed quality during different stages of production, processing and handling; seed quality control: concept and objectives; Central Seed Certification Board (CSCB).

**UNIT-II**

Regulatory mechanisms of seed quality control- organizations involved in seed quality control programmes; seed legislation and seed law enforcement as a mechanism of seed quality control; the Seed Act (1966), Seed Rules (1968), Seed (Control) Order 1983; New Seed Bill-2004.

**UNIT-III**

Seed Certification- history, concept and objectives of seed certification; seed certification agency/organization and staff requirement; legal status and phases of seed certification; formulation, revision and publication of seed certification standards; Indian Minimum Seed Certification Standards (I.M.S.C.S.); general and specific crop standards including GM varieties, field and seed standards.

**UNIT-IV**

Field Inspection- principles, phases and procedures; seed sampling, testing, labeling, sealing and grant of certificate; types and specifications for tags and labels; Introduction to IPRs; Plant Variety Protection and its significance; UPOV and its role; DUS testing- principles and applications; essential features of PPV & FR Act, 2001.

**Practical**

- General procedure of seed certification; identification of weed and other crop seeds as per specific crops.
- Field inspection at different stages of a crop and observations recorded on contaminants and reporting of results.
- Inspection and sampling at harvesting/threshing, processing and after processing for seed law enforcement.
- Testing physical purity germination and moisture.
- Specifications for tags and labels to be used for certification purpose
- Grow-out tests for pre and post-harvest quality control.
- Visits to regulatory seed testing laboratory, including plant quarantine lab and seed certification agency

**Suggested Readings**

- Agarwal RL. 1997. Seed Technology. Oxford & IBH.
- Anonymous 1992. Legislation on Seeds. NSC Ltd., Department of Agriculture and Cooperation, Ministry of Agriculture, New Delhi.
- Nema NP. 1986. Principles of Seed Certification and Testing. Allied Pubs.
- Tunwar NS & Singh SN. 1988. Indian Minimum Seed Certification Standards. CSCB, Ministry of Agriculture, New Delhi.



**B. Sc. 5<sup>th</sup> SEMESTER**  
**DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)**  
**OPTION-II**

**STH516D1B: SEED TECHNOLOGY - SEED PRODUCTION IN FIELD CROPS**

Credits: Theory-4, Practical-2

**THEORY: LECTURES: 60**

**UNIT- I**

Basic principles in seed production and importance of quality seed. Floral structure, breeding and pollination mechanism in self-pollinated cereals viz. wheat, barley, paddy.

**UNIT- II**

Floral structure, breeding and pollination mechanism in cross pollinated cereals viz maize, sorghum, bajra etc.; methods and techniques of quality seed production in cross-pollinated cereals and millets.

**UNIT-III**

Floral structure, breeding and pollination mechanism; methods and techniques of seed production in pulses (green gram, black gram, field beans, peas etc.).

**UNIT- IV**

Floral structure, breeding and pollination mechanism; methods and techniques of seed production in major oil seeds (groundnut, rape and mustard) and commercial fibers (cotton and jute).

**Practical**

- Planning of Seed Production, requirements for different classes of seeds in field crops - unit area and rate.
- Seed production in cross pollinated crop with special reference to land, isolation, planting ratio of male and female lines.
- Synchronization of parental lines and methods to achieve synchrony supplementary pollination.
- Pollen storage, hand emasculation and pollination in Pea, Tomato.
- Detasseling in Maize, identification of rogues and pollen shedders.
- Gametocide application and visits to seed production plots etc.

**Suggested Readings**

- Agrawal, P.K. & M. Dadlani, 1995. Techniques in Seed Science and Technology (2nd Ed.) South Asian Publ. New Delhi.
- Agrawal, R.L. 1997. Seed Technology (IInd Ed.) Oxford & IBH Publ. Co. Daryaganj, New Delhi.
- Bailly, R. Gregg, Alvin, G. Law, S.S. Virde and Balis, J.S. Seed Processing. Cooperatively published by NSC, New Delhi and Mississippi State University and UNSAID.
- McDonald MB Jr & Copeland LO. 1997. Seed Production: Principles and Practices. Chapman & Hall.

**BA / BSc 6th SEMESTER  
DISCIPLINE SPECIFIC ELECTIVE (DSE)**

**GG616D: FUNDAMENTALS OF DISASTER MANAGEMENT**

**CREDITS: THEORY: 4, PRACTICAL: 2  
Maximum Marks 60**

**THEORY (4 CREDITS)**

**Credit-I**

- 1) Meaning and Definition- Hazard and Disaster
- 2) Introduction to Geo-Physical Disasters
- 3) Earthquakes
- 4) Landslides
- 5) Tsunami

**Credit-II**

- 1) Introduction to Hydro-meteorological Disasters
- 2) Cyclones
- 3) Cloud bursts, Floods and Droughts
- 4) Introduction to Man-made Disasters- Nuclear & Chemical Disasters

**Credit-III**

- 1) Meaning & Scope of Disaster Management
- 2) Elements of Disaster Management-
- 3) Concept of Disaster Risk & Vulnerability

**Credit-IV**

- 1) Disaster Management Cycle
- 2) Response Phase
- 3) Recovery Phase
- 4) Reconstruction and Rehabilitation Phase
- 5) Disaster Mitigation & Preparedness Phase

**PRACTICAL (2 CREDITS)**

**Maximum Marks = 30**

**Credit - V**

- |   |               |
|---|---------------|
| 1. Determination of Earthquake Epicenter                                  | (6 Exercises) |
| 2. Earthquake Intensity Measurements (Scales)                             | (6 Exercises) |
| 3. Earthquake Response through Mock drill                                 | (6 Exercises) |
| 4. Preparation of First Aid Box and its application in specific disasters | (4 Exercises) |

**Credit-VI**

- |   |                |
|---|----------------|
| 1. Emergency Response for Flood and Fire Hazard                 | (6 Exercises)  |
| 2. Project Report based on Field Study of any disaster hit area | (12 Exercises) |

**Suggested Readings**

1. Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K
2. Carter, W. Nick, 1991: Disaster Management, Asian Development Bank, Manila
3. Firefly Guide to Global Hazards, Robert Louis Kovach, Bill McGuire, Firefly Books, 2004
4. H.K. Gupta (2003) Disaster management
5. David Etkin (2014) Disaster Theory, Elsevier.



**B. Sc. 6<sup>th</sup> SEMESTER**  
**DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)**

**OPTION-II**

**STH616D1B: SEED TECHNOLOGY - HYBRID SEED PRODUCTION**

**Credits: Theory-4, Practical-2**

**THEORY: LECTURES: 60**

**UNIT-1**

Pre requisites for hybrid seed production; mechanisms and management of pollination in autogamous and allogamous crops; genetic constitution of varieties, hybrids and basic principles in seed production.

**UNIT- II**

Heterosis: definition, expression and estimation of hybrid vigour; utilization of heterosis in agricultural, horticultural and other crop plants for crop improvement. Genetic load and inbreeding depression.

**UNIT-III**

Techniques of hybrid seed production; emasculation and crossing; use of self-incompatibility, modification of sex; types of male sterility and exploitation in hybrid development and its use in hybrid seed production; development and maintenance of A, B and R line in rice.

**UNIT-IV**

Fertility restoration; use of chemical hybridizing agents, problems of non-synchronization in flowering of parental lines and methods to overcome; planting ratios and population density in relation to hybrid seed yield; salient features of hybrid seed production of various crops viz., rice, maize, tomato and cucumber.

**Practical**

- Methods of hybrid seed production in major agricultural and horticultural crops eg. Maize, Rice, Tomato, Brinjal.
- Planting of rows/blocks of parental lines and manipulations for achieving flowering synchronization for production of hybrid seeds.
- Maintenance of A, B and R lines and production of breeder seed
- Genetic purity tests.
- Determination of cost of hybrid seed production of various crops.
- Visit to seed production plots.

**Suggested Readings**

- Basra AS. 2000. Heterosis and Hybrid Seed Production in Agricultural Crops. Food Product Press.
- McDonald MB & Copeland LO. 1997. Seed Production: Principles and Practices. Chapman & Hall.
- Singhal NC. 2003. Hybrid Seed Production. Kalyani Publishers.

## 6<sup>th</sup> SEMESTER

### OPTION – I

#### SC616DA SERICULTURE - SILKWORM COCOON TECHNOLOGY

(Credits: Theory-04, Practical-02)

#### THEORY

##### UNIT-I: SELECTION OF COCOON FOR REELING

1. Evolution of silk reeling industry and its present status.
2. Quality of cocoon: Cocoon shell ratio, cocoon shell weight, silk filament length, cocoon reelability, factors affecting reelability.
3. Physical and chemical properties of silk fiber.
4. Raw materials for silk reeling: Selection of cocoon for reeling. Assessment of renditta, cocoon gradation, cocoon procurement and transportation.

##### UNIT-II: COCOON PROCESSING

1. Cocoon drying: Different methods, conventional and modern techniques steam stifling, hot air dryer, sun drying and others, advantages and disadvantages.
2. Cocoon sorting and preservation: Separation of defective cocoons, deflossing, methods of storing and preservation of cocoons.
3. Cocoon cooking: Principles of cocoon cooking.
4. Cocoon cooking equipment and brushing: open pan, three pan boiling methods, cocoon brushing hand and mechanical brushing.

##### UNIT-III: RAW SILK MANUFACTURE (REELING AND RE-REELING)

1. Reeling appliances: Concept of silk reeling, Country charkha, Cottage machine, Multi-end reeling machine, Automatic machine.
2. Reeling operations : Formation of reeling end, jettebout, croissure, reels
3. Re-reeling: Re-reeling machine, lacing, denier, skeining, booking and storage.
4. Water quality and silk reeling: Use of water in silk reeling, water quality, relationship between water quality and silk reeling, water quality standards.

##### UNIT-IV: SILK THROWING AND WEAVING:

1. Raw silk testing and grading: Methods of testing, standard testing appliances and equipment methods of grading of raw silk.
2. Silk throwing and twisting: Throwing preparation for twisting, Twisting of yarn, soaking, dressing, drying, winding, doubling and twisting.
3. Silk weaving: Warping, beaming, drawing denting, weft preparation, power loom and handloom weaving.
4. Silk byproducts : Reeling waste and its utility in spun silk industry utility of pupae



## **PRACTICALS**

- a) Identification of Textile fibres by physical and chemical tests—microscopic examinations, flame test and solubility test for polyester, cotton, silk.
- b) Identification of defective cocoons and their percentage in a lot, determination of shell ratio of good cocoon.
- c) Single cocoon reeling—determination of average filament length and denier.
- d) Practical demonstration of cooking, reeling and re-reeling of a sample cocoon.
- e) Practical demonstration of multi-end silk reeling machine.
- f) Reeling appliances used in mulberry cocoon reeling.
- g) Study of silk fabric manufacturing unit power loom and handloom (visit to spun silk mill) during on the training.
- h) Visit to various reeling and weaving units of state and centre for practical demonstration.

SC616DB SERICULTURE - SILK REELING TECHNOLOGY

(Credits: Theory-04, Practicals-02)

**Unit-I: Pre-Reeling operation-I**

1. Cocoon harvesting and transportation of Cocoons.
2. Optimum conditions for cocoon storage.
3. Cocoon sorting or assessment of cocoons.
4. Physical properties of cocoons.

**Unit-II: Pre-Reeling operation-II**

1. Stifling: Different methods of stifling their advantages and disadvantages.
2. Cocoon cooking: Methods of cocoon cooking/boiling open-pan system and three-pan system.
3. Brushing: Hand and mechanical brushing of cocoons.
4. Quality of water for cocoon boiling/cooking.

**Unit III: Reeling Process**

1. Definition of Silk –Reeling: Different Methods country charkha, cottage machine and multi end reeling machine.
2. Reeling operation: Formation of reeling end, Jeetle boule, and coissures.
3. Quality of water for silk-reeling and impact of water on quality of silk.
4. Re-Reeling what are the advantages of re-reeling.

**Unit IV: Silk-throuling and weaving.**

1. Raw silk testing and grading: Methods of silk testing and grading.
2. Throuling preparation for lueisting, twisting of yarn, soaking, drying and winding.
3. Chemical properties of silk yarns.
4. Silk by-products- Reeling waste and its utility in spun silk industry and utility of pupae.

**Practicals**

- a) Identification of textile fibers by physical and chemical tests, microscopic examination, flame test and solubility test for polyester, cotton and silk.
- b) Define cocoon percentage for cocoon lot.
- c) Single cocoon reeling –determination of average filament length and denier and shell ratio percentage of a sample cocoon.
- d) Practical demonstration of multi end reeling machine.
- e) Practical demonstration of cooking, reeling and re-reeling.
- f) Reeling appliances used in silk reeling.
- g) Visit to different reeling and weaving units of state and center for practical demonstration.



## **6<sup>th</sup> SEMESTER**

### **OPTION-III**

#### **SC616DC SERICULTURE - COCOON AND REELING TECHNOLOGY**

**(Credits: Theory -04, Practical-02)**

##### **Unit-I: Cocoon drying, sorting and cooking**

1. Objective of cocoon drying
2. Various methods of cocoon stifling/drying
3. Cocoon sorting and preservation. Objective of cocoon sorting and formulae
4. Cocoon cooking methods. Advantages and disadvantages

##### **Unit-II: Raw silk Reeling**

1. Introduction
2. Various reeling devices
3. Reeling operations : Formation of reeling end, jettebout, croissure, reels
4. Re-reeling: Object and re-reeling appliance

##### **Unit-III: Raw silk testing and grading**

1. Introduction
2. Types of tests: Qualitative test, Sample test and Quantitative test.
3. Raw silk grading/classification
4. Boil off test and exfoliation test

##### **Unit-IV: Silk throwing and weaving**

1. Introduction
2. Throwing preparation for twisting, Twisting of yarn, soaking, dressing, drying, winding, doubling and twisting.
3. Silk weaving: Warping, beaming, drawing denting, weft preparation, power loom and handloom weaving.
4. Chemical processing of silk yarns and fabrics: Degumming, bleaching, dyeing, printing of silk yarns and fabrics.

## PRACTICALS

- a) Study of cocoon sorting process: Identification of defective cocoons and their percentage in a lot
- b) Identification of Textile fibres by physical and chemical tests—microscopic examinations, flame test and solubility test for polyester, cotton, silk.
- c) Cocoon assessment: Determination of cocoon weight, shell weight and shell ratio of good cocoon.
- d) Practical demonstration of cooking
- e) Single cocoon reeling—determination of average filament length.
- f) Reeling appliances: Study of Reeling and Re-reeling operations and devices.
- g) Practical demonstration of multi-end silk reeling machine.
- h) Study of silk fabric manufacturing unit power loom and handloom (visit to spun silk mill) during on the training.
- i) Visit to various reeling and weaving units of state and centre for practical demonstration.



**SEMESTER 2<sup>nd</sup>  
MINOR COURSE**

**SET222N SEED TECHNOLOGY (SEED HEALTH AND FARM MANAGEMENT)**

**CREDITS: THEORY : 04; PRACTICALS: 02**

**Objectives:** To impart a comprehensive knowledge of seed-borne diseases, pests and their management and to acquaint students with various agricultural field practices vis-à-vis seed health.

**UNIT I**

Introduction and importance of seed pathology; Brief account of seed borne fungi, bacteria, viruses and nematodes; Mechanism of seed infection and transmission of seed pathogens; Important seed borne diseases caused by Bacteria, Fungi, Viruses and Nematodes. Influence of environmental factors on seed borne diseases; Methods of controlling seed borne diseases (cultural, physical and chemical). Role of bio-pesticides for control of seed borne diseases.

**UNIT II**

Introduction to seed Entomology; Losses caused by insect damage and its economic implications; Insect herbivory, their nature of damage and management of following crops: Paddy – Grasshopper, Maize – Army worm, Pea – Pea pod borer. Study of insect and nature of damage of some store grain pests. Methods of insect pest control (cultural, mechanical, physical and chemical). Seed quarantine- concept, objectives and procedure. Seed Quarantine set up in India.

**UNIT III**

Different production practices/field practices as tillage, irrigation, sowing, transplanting, harvesting and threshing. Concepts of crop rotation, mixed cropping, multiple cropping and dry land farming. Scope and basic principles of Seed Farm Management.

**UNIT IV**

Maintenance of soil fertility. Manures and fertilizers. Different types of fertilizers used in crops, farmyard manure, compost, green manures, vermi-compost and biofertilizers. Weeds- Different type of weeds, classification of weeds. Weed management.

**PRACTICALS:**

1. Detection of fungal/bacterial pathogens of some common crop seeds by visual/stereoscopic microscopic examinations and or washing techniques.
2. Detection of seed borne fungi of some common crops (Maize, Paddy, wheat) by any incubation method.
3. Collection and identification of insects (Grass hopper, Rice weevil, Khapra beetle).
4. Plant protection equipments- their operation and maintenance.
5. To study the morphology and mouth parts of grasshopper, leaf miner, Rice weevil, Khapra beetle.
6. To study the garden soil characteristics (pH, bulk density, water holding capacity).
7. To study some common weeds of crop plants and crop seed nurseries.
8. Description and chemical formula of some recommended seed fungicides and insecticides using charts/photographs.
9. Field visits.

**SUGGESTED READINGS:**

- Agarwal VK & Sinclair JB. 1997. *Principles of Seed Pathology*.
- Boca Raton, Neergaard P. 1988. *Seed Pathology*, Mac Millan.
- Karuna V. 2007. *Seed Health Testing*, Kalyani.
- Karuna vishunivat (2009) *Fundamentals of seed pathology*.
- Reddy SR. 2000. *Principles of Crop Production*, Kalyani.
- Bilal Ahmad Wani (2021) *Seed Technology and Management* Kusal Publishers

**Department of : Seed technology**

List of the students for the session March 2023 – April 2024

Title of the course and code: Visit to department of agriculture Anantnag for experiential learning tour under short term certificate course

Semester (CBCS/NEP): 2nd , 4th

Field visits to various places (experiential learning through field work, project work and/or internship) prescribed in the syllabus of the course (attested copy) and core papers. MoUs (attested copy) with relevant organizations/institutions visited for these courses, if any.

S. No	Name	S. No	Name
1	Muzamil javid	23	Shakeela zunain
2	Amad gull	24	Mahida khursheed
3	Khalid ahmad itoo	25	Khawish tariq
4	Mohd hussain sheikh	26	Aaliya abbas
5	Azhar bilal wani	27	Shabnam tariq
6	Murtaza rashid	28	Abdul haq anjum
7	Yawar bilal		
8	Tabeena ramzan		
9	Umair aijaz kuttay		
10	Aubair fared naik		
11	Secrat bint ahmad		
12	Arbeena aijaz		
13	Akeela akram		
14	Kowsain jan		
15	Aariz shabir wani		
16	Misba abdullah		
17	Tabinda javid		
18	Munaza shafi		
19	Bhat muneeb farooq		
20	Abrar ismail		
21	Simran majeed		
22	Rutba tariq		

  
Head of the Department

**HOD Seed Technology**  
Shaheed Himayat Muzzamil Memorial  
Group D.

  
Principal





Govt. of J&K (UT)  
Higher Education Department  
محکمہ اعلیٰ تعلیم  
उच्चतर शिक्षा विभाग



OFFICE OF THE PRINCIPAL

**SHAHEED HIMAYUN MUZZAMIL MEMORIAL**

**Govt. Degree College, Anantnag**

Khanabal, Anantnag - 192101 (J&K) NAAC ACCREDITED GRADE "B+" (CGPA: 2.53)

No: DCA / Admin / 24 / 1002  
2024

Date: - 04 / 05 / 2024

Subject: Permission to visit Department of Agriculture Anantnag alongwith 30 students.

**ORDER**

Sanction is hereby accorded to 30 students of Seed Technology Department (list enclosed) along with 03 staff members to visit Department of Agriculture Anantnag for experiential learning tour, under Short Term Certificate Course/ Skill Training on 04-05-2024. Further the college Bus Driver Mr. Zahoor Ahmad Teeli is directed to ferry the students and staff members to the venue.

(Prof. Muzaffar Ahmad Bhat)  
Principal

Copy to the:-

1. All concerned for information and compliance.
2. Office record file.



OFFICE OF THE PRINCIPAL

**Government Degree College, Anantnag**  
**Khanabal, Anantnag - 192101 (J&K)**



Website: [www.gdcboysang.ac.in](http://www.gdcboysang.ac.in)

Tel. No. (O) 01932-222308

No: DCA/ Sub. Tour

NAAC ACCREDITED GRADE 'B' (CEPA-2.53)

College with Potential for Excellence (CPE) Status by the UGC

Mail: [principal@gdcboysang.ac.in](mailto:principal@gdcboysang.ac.in)

Fax: 01932-223509

Dated: 21/11/2023

/23/2620

**ORDER**

Sanction is hereby accorded to 29 students (list enclosed) for attending an outreach activity programme on **22-11-2023** alongwith below mentioned escorting staff at Islamic University of Science and Technology, Awantipora:

1. Prof. Arshid Ahmad
2. Prof. Musadiq Qadir
3. Mrs. Meema Akhter (LFE)

Further College Bus driver is directed to ferry the students from College campus to and fro to the event.

(Prof. Muzafar Ahmad Bhat)  
Principal

Copy to the:

1. Head Department of Physics, IUST, Awantipora for information.
2. All staff members for compliance.
3. Office record file.



OFFICE OF THE Head Of  
Department Physics

Govt. Degree College, Anantnag.

Khanabal, Anantnag – 192101 (J&K)

NAAC ACCREDITED COLLEGE NO. 10/2012-2015

to: PDBC/

Dated:

List of students for attending outreach activity on 22/11/2023 at IUST University:

S.no	Name of students	Class Roll no	Phone no
01	Anayat yousuf bhat	1825	9419625539 ✓
02	Murtaza-ibni-showkat	1826	6005539354 ✓
03	Basit Mushtaq	1809	6005262600 ✓
04	Muneeb Gulzar	1829	9596136054 ✓
05	Kaysir Ahmad	1841	7006247682 ✓
06	Tawqeer Mir	1815	9622211505 ✓
07	Muzakir Ahmad Khan	1828	9103771457 ✓
08	Suhaib Nabi	1827	7006374897 ✓
09	Faizan Ganie	1819	6005851944 ✓
10	Ajiaz hameed	1845	6005861751 ✓
11	Peer mohammad ubaid	1830	6006645811 ✓
12	Zubair Ahmad Khan	1824	6006475641 ✓
13	Salik Sajad	1838	9682507362 ✓
14	Faizan Fayaz	1808	9622396003 ✓
15	Mohd Faher	1818	8082558081 ✓
16	Gowhar Bashir	1807	7889486660 ✓
17	Shahid Ayoubhat	1823	9103323350 ✓
18	Asrar Ahmad Bhat	1828	6005116401 ✓
19	Shafee	1820	7889987357 ✓
20	Sahil Mohiuddin	1804	9682390179 ✓
21	Suhaib Nazir	1814	8899543582 ✓
22	Selman Javid	1801	8899296312 ✓
23	Faheem Javid	1810	7889682189 ✓
24	Abdul Rouf Bhat	04	8899458056 ✓
25	Mohd Ishfaq Bhat	09	9596553275 ✓
26	Rahil riyaz bhat	44	7006051483 ✓
27	Rashid Bashir Khanday	1807	7889712034 ✓
28	Kashif qadri	1821	8899736979 ✓
29	Saboora lateef	1818	9682122699 ✓

Copy to:

1. Concerned Teacher
2. Office Records



# Department of Physics

Government Degree College, Anantnag

GDCA/Phy/2023/L<sup>1</sup> 4



Dated: 23/11/23

## Report on Visit to Department of Physics, IUST as part of an Outreach Program

On 22<sup>nd</sup> November, 2023 about 24 students of the Department of Physics, Government Degree College, Anantnag accompanied by faculty members of the department made a visit to IUST as a part of Outreach program by the host institute. The program made students aware about the career opportunities and various avenues available for pursuing higher education in India as well as abroad. After the awareness program, students visited various facilities of the host institution and were given demonstration of working of various scientific instruments by the experts. At the end there was an interactive session between the students and various experts invited for the program.



Anantnag, J&K, India  
W20C-1706, Anantnag, 192122  
Lat: 33.926658°  
Long: 75.020709°  
22/11/23 03:23 PM



Anantnag, J&K, India  
W20C-1706, Anantnag, 192122  
Lat: 33.926658°  
Long: 75.020709°  
22/11/23 03:01 PM



*Signature*  
11/2023



Invitation for Outreach Activity - principal@gdcboysang.ac.in - Government Degree College Anantnag Mail

Gmail

Search in mail

Compose

Inbox

830

Invitation for Outreach Activity External

Starred

Snoozed

Sent

Drafts

Categories

Social

Forums

Promotions

More

Labels

Unwanted

HOD Department of Physics

Respected All,

This is an invitation to the undergraduate students of your college from basic sciences to our department, the Department of Physics, IUST Kashmir. Our department is conducting an outreach activity on 22-11-2023 for college students. The students will have access to advanced instruments available in the department to foster their interest in physics. The program is being organized to interest among the students of our region in basic sciences. It is pertinent to mention that we have scheduled sessions to cater to the interest of the participating students to pursue careers in basic sciences.

We'd like to ask that twenty students from the science streams of your college may be sent on the scheduled date for the said event.

Thanking You,

Dr. Niyaz Ahmad Rather  
Head, Department of Physics  
IUST, Kashmir


Handwritten notes and signatures:

- Top left: *20/11/23*
- Middle left: *15/11/23*
- Bottom left: *15/11/23*
- Bottom right: *15/11/23*

## Department of chemistry

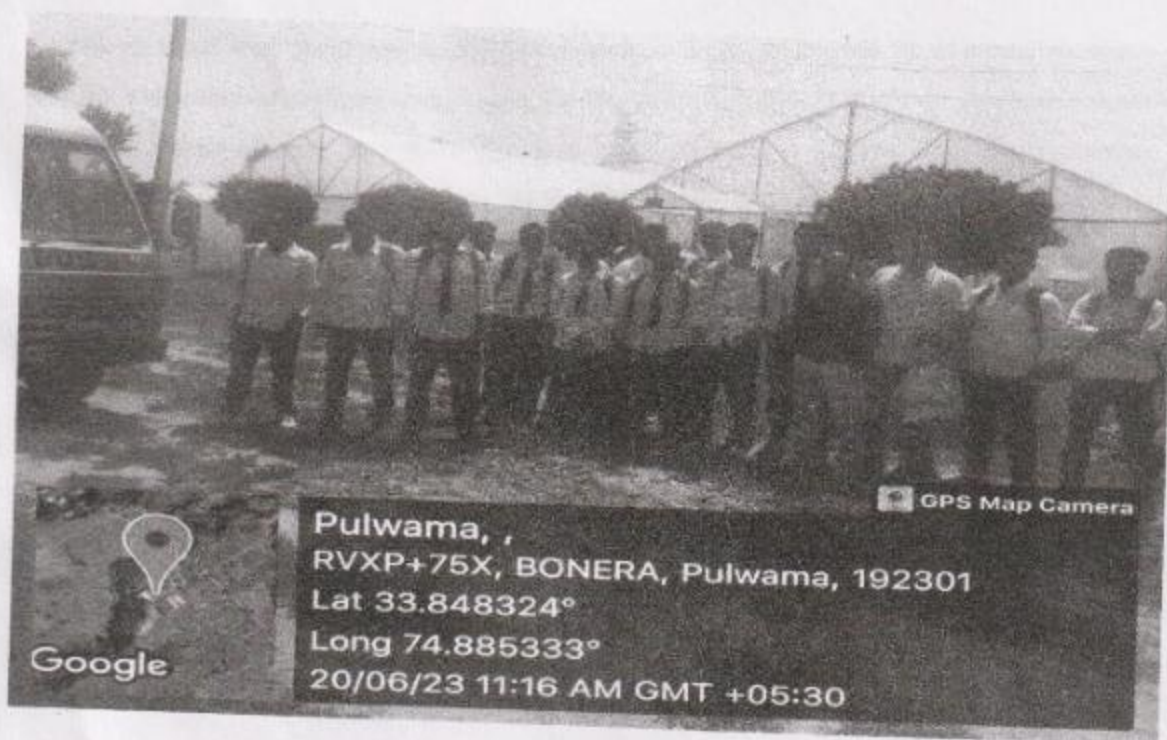
### TOUR REPORT

The Department of Chemistry, Govt Degree College Anantnag embarked the students for a subject tour on 20<sup>th</sup> June 2023 to Bonera Pulwama, which is the field station of Indian Institute of Integrated Medicines (IIIM) Srinagar. The Students of the college of 2<sup>nd</sup> semester whose number was 23 were boarded at 9:00 AM in the college bus on the said date and were escorted with two faculty members of the college Dr. Niyaz Ahmad Mir and Dr. Bashir Ahmad Shairgojray along with Lab. bearer Mr. Sameer Khalil Dar. The students were enthusiastic, impatient and zest to reach the field station. It took almost 1:00 hr to cover this distance from the college to the destiny. The students were welcomed with warmth and geniality by the officers of the host institution. The resource person on the occasion was Dr. Shahid Rasool (Senior Scientist) who imparted practical knowledge (through floral identification and Steam Distillation processes) to the students on the variety of aromatic and medicinally important plants grown at CSIR IIIM Field Station Bonera. One of the experts namely Dr. Iqra Shah (Project Assistant) also deliberated at the occasion on the value and importance of aromatic plants and its prospective scope in the student carrier employability.

 Head Department of Chemistry  
Govt. Degree College Anantnag

23/06/2023  
H.O.D. Chemistry






Some of the aromatic and medicinal plants that are grown there are English Lavender, rosemary, carnation, hairy leaf bergenia, starflower, saffron crocus and clary sage. The said experts exhaustively shed light on the morphological and floral knowledge of the different varieties of

Head Department of  
Govt. Degree College

23/06/23

flowers as mentioned above and explained the students the basic knowledge of aroma chemistry and the extraction of aromatic compounds via the steam distillation method. Applications and medicinal values of each plant were discussed in length and breadth and students have shown keen interest while listening the experts. At the end, there was an interactive session between the students and the experts that definitely could be of great help to them. At the fag end of the programme, one of the faculty member of our institute namely Dr. Bashir Ahmad Shairgojray extended a vote of thanks to the host institute on the behalf of college for giving the opportunity to the students of our college in imparting practical knowledge to them and sharing your expertise and experience. At 3:00 pm, the students departed from the field station and reached the college at 4:15 PM.

  
HOD Head Department of Chemistry  
Govt. Degree College 23/06/2023  
Department of Chemistry



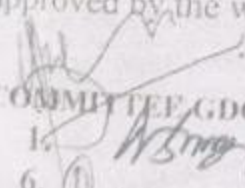
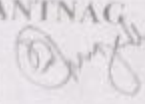
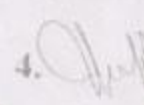


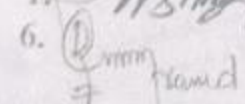
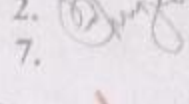
**FINAL SCHEDULE FOR SUBJECT TOURS/ FIELD TRIPS /INDUSTRIAL VISITS/ MONUMENTAL VISITS--- (PHASE -1")**

The Excursion Committee was in receipt of applications put in by several departments for the conduct of Subject tours/ field trips /industrial visits/ monumental visits etc. In response to this, the Excursion Committee put out the tentative schedule for carrying out these activities as notified earlier under **Annual Calendar of Activities 2023**. In order to finalize the dates for these curricular activities, the Excursion Committee sought requisite documents from the concerned Departments to substantiate their relevance and indispensability to the curriculum. After thorough perusal of the supporting documents the Schedule finalized in respect of these departmental visits for the month of June is as under. The schedule is hence submitted for approval.

S. No	Name of the Department	Finalized date for visit	Destination visiting	Total students embarking	Remarks/Nature of visit/Whether permission obtained or not?
1	Commerce	17 June	Rangreth Srinagar	30	Industrial Tour/Yes
2	Chemistry	20 June	IIIM Bonera	30	Lab Visit/yes
3	Seed Technology	21 June	Aru Phalgam	30	Subject Tour/Yes
4	Water Management/EVS	22 June	Kokernag	30	Subject Tour/Yes
5	Zoology	24 June	Dachigam National Park	60	Subject tour/Yes

The Departments mentioned herein shall seek and confirm the availability of transportation facility from the convener, Transport Committee after the schedule is approved by the worthy Principal.

CONVENER  
EXCURSION COMMITTEE GDC ANANTNAG

Members: 1.  2.  3.  4.  5.   
6.  7. 

*Approved as committee members*  
*16/6/23*

# Government Degree College Anantnag

## List of Students

S.No.	Name of the student	Class	Cell No.
✓1.	SHOIB RASHID ✓	2 <sup>ND</sup> SEMESTER	9906541622
✓2.	AZIM MUSHTAQ ✓	2 <sup>ND</sup> SEMESTER	9149432836
✓3.	MIR SHAHID IQBAL ✓	2 <sup>ND</sup> SEMESTER	7006016460
✓4.	MYSER MANZOOR ✓	2 <sup>ND</sup> SEMESTER	8493042897
5.X	SAMI ULLAH DAR	2 <sup>ND</sup> SEMESTER	9596551520
✓6.	MHMD ABASS LONE ✓	2 <sup>ND</sup> SEMESTER	7889895009
✓7.	M YASEEN MAGRAY ✓	2 <sup>ND</sup> SEMESTER	7889593790
✓8.	HIDAYATULLAH MIR ✓	2 <sup>ND</sup> SEMESTER	6006950377
9.	UMAR HAMID ✓	2 <sup>ND</sup> SEMESTER	6005322900
✓10.	YASIR AHMAD DAR ✓	2 <sup>ND</sup> SEMESTER	9682352362
✓11.	TAHYZEEB SHAMEEM ✓	2 <sup>ND</sup> SEMESTER	6006607455
12.X	MOHD AMIN WANI	2 <sup>ND</sup> SEMESTER	9622041018
13.X	MUQADAS AHMAD DAR	2 <sup>ND</sup> SEMESTER	6005874495
✓14.	TAJAMUL HUSSAIN DAR ✓	2 <sup>ND</sup> SEMESTER	6005690497
✓15.	ATHAR AMIN ✓	2 <sup>ND</sup> SEMESTER	6005365912
16.X	FAISAL FAROOQ	2 <sup>ND</sup> SEMESTER	9622378397
✓17.	YAWAR SHAFI ✓	2 <sup>ND</sup> SEMESTER	6006022523
✓18.	HILAL AHMAD SHEIKH ✓	2 <sup>ND</sup> SEMESTER	6006777680
✓19.	UMER BASHIR ✓	2 <sup>ND</sup> SEMESTER	7889300347
✓20.	SAHIL SHAFI ✓	2 <sup>ND</sup> SEMESTER	6006155450
✓21.	BASIT HASSAN ✓	2 <sup>ND</sup> SEMESTER	8082376095
✓22.	FAHEEM UL HAQ ✓	2 <sup>ND</sup> SEMESTER	6006882889
23.X	ZUBAIT AMIN NAIK	2 <sup>ND</sup> SEMESTER	914992290

Head Department of Chemistry  
H.O.D Govt. Degree College Anantnag  
Chemistry

17/06/23





Office of the Principal

Government Degree College, Anantnag

Khanabal, Anantnag - 192101 (J&K)

No: DCA/ ~~1955~~ 1955

Dated: 19-6-23

## ORDER

Sanction is hereby accorded to the department of Chemistry to visit Bonera Station (Pulwama) of IIM Srinagar for sample collection and basic experimentation work. Dr. Niyaz Ahmad Mir, Dr. Bashir Ahmad Shairgojray, Assistant Professors in the department of Chemistry & Mr. Sameer Khalil, Lab Bearer along with 23 students of BG 2<sup>nd</sup> semester (list enclosed) are hereby deputed to Bonera IIM Pulwama on 20<sup>th</sup> of June 2023.

The College vehicles shall be put in service for carrying the escorting staff and students to and fro the venue.

~~PRINCIPAL~~  
CC-

19/6/23

1. Concerned Officer official for information.
2. Convener College Transport Committee for information.
3. Convener IQAC for information.
4. College driver for compliance.
5. Office file for records.

Department of : SEED TECHNOLOGY

List of the students for the session March 2023 – April 2024

Title of the course and code: One day experiential tour / work shop at high mountain crop research station, Larnoo SKUAST

Semester (CBCS/NEP): 2ND SEMESTER

Field visits to various places (experiential learning through field work, project work and/or internship) prescribed in the syllabus of the course (attested copy) and core papers. MoUs (attested copy) with relevant organizations/institutions visited for these courses, if any.

S. No	Name	S. No	Name
1	Aariz shabir wani	23	Burooj nisar
2	Nazima nisar	24	Aaliya abbas
3	Muzamil javid bhat	25	Khawish tariq
4	Aasra ashique	26	Yamin nisar
5	Asma maqbool	27	Saqib rasheed
6	Hyder parvaiz mir	28	Umair aijaz
7	Faisal mushtaq	29	Aabroo imtiyaz
8	Hashu bashir	30	Simran majeed
9	Soiba rashid		
10	Mehvish gulzar		
11	Aakash ahmad bhat		
12	Aubair fareed naik		
13	Daeim aijaz		
14	Saqlain hassan		
15	Misba abdullah		
16	Munaza shafi		
17	Tabinda javaid		
18	Shbanam mauzoor		
19	Owais rashid magrey		
20	Mahraam maqbool		
21	Imran nazir bhat		
22	Rafiya mukhtar		

Head of the Department

**HOD Seed Technology**

Sh. Hood Himayun Muzamil Memorial  
Govt. Degree College Anantnag

Principal





OFFICE OF THE PRINCIPAL

**SHAHEED HIMAYUN MUZZAMIL MEMORIAL**

**Govt. Degree College, Anantnag**

Khanabal, Anantnag - 192101 (J&K) NAAC ACCREDITED GRADE "B+" (CGPA: 2.53)

No: DCA / Sub. Tour / 24 / 1350

Date: - 08/07/2024

**Subject: - Deputation of Officers/ official in connection with Subject Tour.**

**ORDER**

The following officers/ officials of this College are hereby directed to accompany the 4<sup>th</sup> semester students of the college in connection with subject Tour on 09<sup>th</sup> of July 2024 to Kokernag - Daksum. The List of the Students are enclosed herewith this order as Annexure A. Furthermore, the accompanying staff members are directed to ensure their presence in the College at 08:30 am positively on the scheduled date along with students. The safety of the Students are the sole responsibility of accompanying staff.

S.NO	Name of Officer/ official	Designation
01	Dr. Azad Hussain Khan	Assistant Professor
02	Dr. Bilal Ahmad Wani	Assistant Professor.
03	Mr. Tariq Ahmad Itoo	MTS

(Prof. Muzamil Ahmad Sheeb)  
Principal,  
Shaheed Himayun Muzzamil Memorial  
Govt. Degree College Anantnag (Estb.)

Copy to :-

1. Convener subject Tours for information.
2. HOD Seed Technology for compliance and note.
3. All the concerned for compliance and note.
4. Office records.

Department of : Seed technology

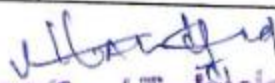
List of the students for the session March 2023 – April 2024

Title of the course and code: Subject tour to Fodder seed production farm, Aru valley Pahalgam

Semester (CBCS/NEP): 2<sup>nd</sup> and 4<sup>th</sup> Minor

Field visits to various places (experiential learning through field work, project work and/or internship) prescribed in the syllabus of the course (attested copy) and core papers. MoUs (attested copy) with relevant organizations/institutions visited for these courses, if any.

S. No	Name	S. No	Name
01	Yasir ahma dar	23	Basharat ali
02	Tahzeeb shameen	24	
03	Samiullah dar	25	
04	Umer hamid	26	
05	Arbaz hamid	27	
06	Daieem aijaz	28	
07	Muzamil manzoor	29	
08	Arif afzal		
09	Rouf ahmad sofi		
10	Faisal mushtaq		
11	Ajmal altaf		
12	Muzamil javid bhat		
13	Saqlain hussain dar		
14	Mohd asif ganie		
15	Zakir hussain reshi		
16	Aakash ahmad bhat		
17	Sobie rashid		
18	Irham mehidah		
19	simran majeed		
20	S. rutba tariq		
21	Adeeba manzoor		
22	Sania mashkooor		

  
HOD Seed Technology  
Head of the Department  
Govt. Degree College Anantnag

  
Principal





OFFICE OF THE PRINCIPAL

Government Degree College, Anantnag.

Khanabal, Anantnag - 192101 (J&K)



Website: [www.adchoysana.org.in](http://www.adchoysana.org.in)

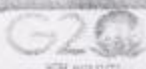
NEAC Accredited & ISO 9001:2015 Certified

E-Mail: [principal@adchoysana.org.in](mailto:principal@adchoysana.org.in)

Fax: 01932-223509

Tel. No. (0) 01932-223508

No: DCA/ Tou /23/ 160



Dated: 20-6-2023

### ORDER

Sanction is hereby accorded for conduct of subject tour/field trip of Seed Technology Department of this college at Fodder Seed Production Farm, Aru Valley Pahalgam on 21<sup>st</sup> of June 2023. Dr. Bilal Ahmad Wani, Dr. Azad Hussain Khan, Assistant Professors (Seed Technology) & Mr. Nazir Ahmad Bhat, Lab bearer along with 29 students of this college are hereby deputed to Aru Pahalgam.

The College Bus shall be put in service for carrying the escorting staff and the students to and fro the venue.

- [Signature]*  
20/6/2023  
Principal  
Government Degree College  
Khanabal
- CC ✓
1. Head Department of Botany Seed Technology for information.
  2. Convener College Transport Committee for information.
  3. Convener IQAC for information.
  4. College Bus driver for compliance.
  5. Office file for records.