## NATIONAL UNIVERSITY



## First Year Syllabus Department of Geography and Environment

Four Year B.Sc. Honours (Integrated) Course Effective from the Session : 2013-2014

National University Subject: Geography and Environment Syllabus for Four Year B.Sc. Honours Course Effective from the Session: 2013-2014

#### Year wise Paper, Marks and Credit distribution

Paper Code	Paper Title	Marks	Credits
213201	Introduction to Geography and Environment	75	3
213203	Introduction to Physical Geography	75	3
213205	Introduction to Human Geography	75	3
213206	Practical-I	75	3
211501	History of the Emergence of Independent Bangladesh	100	4
	Group A (Any Two)		
212807	Chemistry-I	100	4
212808	Chemistry Practical	50	2
213709	Fundamentals of Mathematics	100	4
213711	Calculus-I	50	2
213007	Botany-I	100	4
213008	Botany-I Practical	50	2
213105	Zoology-I	100	4
213106	Zoology Practical - I	50	2
213607	Introduction to Statistics	100	4
213608	Statistics Practical-I	50	2
	Group B (Any Three)		
212009	Introductory Sociology		
	Or	100	4
212111	Introduction to Social Work		
211909	Introduction to Political Theory	100	4
213905	Introduction to Psychology	100	4
212209	Principles of Economics	100	4
	Total =	700	28

#### FIRST YEAR

#### Detailed Syllabus

Paper Code:	213201	Marks: 75	Credits: 3	Class Hours: 45		
Paper Title:	Introduction to Geography and Environment					

- 1. **Geography as a Discipline as Science, Earth Science and Social Science:** Definition, Concepts, Scope and Branches.
- 2. Physical and Human basis of Geography: Relation of Geography with other Disciplines.
- 3. A Brief History of the Development of Geographical Knowledge and Concepts: Ancient Geography-Greek and Roman Period; Geography in the Middle Ages-Muslim Period; Renaissance and Modern Geography; Contemporary Geography.
- 4. **Major Views in Contemporary Geography:** Regional View, Ecological View, Spatial Organization View, Earth Science View, Behavioral View.
- 5. The Concept of Region and Regional Approach to Geography.
- 6. **Environment:** Meaning, Structure, Types and Components of Environment; Geography and Environment; Environment and Society.
- 7. Man-environment Relationships: Determinism, Possibilism and Neo-possibilism
- 8. Tools and Techniques in Geography: Maps, Scales, Models, and GIS.
- 9. **The Shape and the Basic Dimensions of the Earth:** Rotation and Revolution of the Earth and their Effects; Determining Location on the Earth Surface.

#### **Selected Readings:**

James, Preston E. All Possible Worlds: History of Geographical Ideas Chorley, R. and Peter Haggett (ed.) Models in Geography Hartshome, R. The Nature of Geography. Unwin, Tim. 1992. The Place of Geography, Longman, New York. Singh, Savindra, 1991, Environmental Geography, Prayag Pustak Bhawan, Allahabad, India. Ahmed, Nafis. *Muslim Contributions to Geography* Saxena, H.M. 1999. Environmental Geography, Rawat Publications, New Delhi. De Blij, H.J. and Muller, Peter O. 2004. Geography: Realms, Regions and Concepts, 11<sup>th</sup> edn. John Wiley and Sons, Inc. Bharucha, Erach. 2005. Textbook of Environmental Studies, University Press Pvt. Ltd. India. Haggett, P. Geography : A Modern Synthesis. Harvey, David. Explanation in Geography. Islam, M. Aminul 2006. Bhugoler Dristibhangi o Dashan: Samakalin Probonata. Bangladesh Geographical Society, Dhaka. Encyclopaedia Britanica, Encyclopaedia of Social Sciences Murphy, Rhodes. An Introduction to Geography

Paper Code:	213203	Marks: 75	Credits: 3	Class Hours: 45
Paper Title:	Introduction	to Physical Geograp	ny	

- 1. Physical Geography: Nature, Scope and Relation with Other Disciplines of Natural Sciences.
- 2. Historical Development of Physical Geography
- 3. Solar System: Theories of Origin, Devolvement and Expansion.
- 4. Origin of the Earth-different hypothesis: Earth's Development, Geological Time-scale.

- 5. Lithosphere: Earth's Crust and Interior, Rocks and Minerals, Weathering and Erosion, Seismology, Isostasy, Earth's Movements-endogenic and exogenic, Continental Drift and Plate Tectonics, Agents of Sculpture (river, glacier wind wave)
- 6. **Atmosphere:** Composition of Atmosphere, Elements of Weather and Climate, Temperature, Pressure, Wind Systems and Humidity.
- 7. **Hydrosphere:** Global Distribution of Water; Ocean Shape, Size and Volume; Hydraulic Cycle; Movement, Causes and Effects of Ocean Current.
- 8. Biosphere: Distribution of Plant and Animals and their Related Factors.

#### Selected Readings:

James, P.E., A *Geography of Man*, Blaisdall Publishing Company.
Robinson, H., *Physical Geography*, Mac Donald & Evans, Thronbury, W,D., *Principles of Geomorphology*, John Wile,London.
Holmes, A. *Principles of Physical Geology*.
Cook, Ian et al. *Geography in Focus*, CPL (Causeway Press). For all Paper
Wadia, D.N., *Geology of India*, Macmillan & Co. London.
Singh, Savindra, 1999, *Physical Geography*, Prayag Pustak Bhawan,
Allahabad, India. Lake, P. *Physical Geography*, Macmillan's & Co.,
Calcutta.
Monkhouse, F.J. *The Principles of Physical Geography*, University of London Press, London.

Paper Code:	213205	Marks: 75	Credits: 3	Class Hours: 45
Paper Title:	Introduction	to Human Geograph	У	

- 1. Human Geography: Definition, Concepts, Contents and Scope.
- 2. Branches or Components of Human Geography.
- 3. Historical Development of Human Geography.
- 4. Approaches to the Study of Human Geography.
- 5. Human Occupancy of the Earth and Man-Environment Relationships.
- 6. **Human Population:** Size, Structure, Composition, Distribution and Change; Dynamics of Population-fertility, mortality and migration; Population Growth and Projection; Population as Resources.
- 7. Economic Activities of the People: Primary. Secondary, Tertiary and Quaternary.
- 8. Transport and Trade: Major Modes of Transport, International Trade and Trade Routes
- 9. Human Settlements: Classification, Hierarchy, Forms and Pattern.
- 10. Society and Culture: Social Stratification, Cultural Elements.

#### Selected Readings:

Emrys, Jones. 1995: *Human Geography*, Chatto and Windus, London Chapman, Keith. 1988: *People Pattern and Process: An Introduction to Human Geography*, John Wiley and Sons, New York. Cook, Ian et al. *Geography in Focus*, CPL (Causeway Press). For all Paper Brock, J.O. M. & Webb. A, : *Geography of Mankind*, New York. Chisholm, M. 1975. *Human Geography:*  Evolution or Revolution, Harmonds Worth, Penguin Books.
Barnes, Trevor and Gregory, Derek edt. 1997. Reading Human
Geography: The Poetics and Politics of Inquiry, Arnold, London.
James, P.E. and Martin, G.J. 1981. All Possible
Worlds: A History of Geographical Ideas, 2nd edn. New
York, John Wiley.
Tidswell, V. 1976. Patterns and Process in Human
Geography, University Tutorial Press, London.
Chorley, R.J. and Haggett, P. eds. 1967. Models in Geography, London, Methuen.
Hortshorn, T. A. and J. W. Alexander, J.W. 1988: Economic Geography, Prentice-Hall, New Delhi

Bradford, M.G. & Kent, W.A. 1987: *Human Geography*, Oxford
University Press, U.K. Norton, W. 1988: *Human Geography*, Oxford
University Press, Canada.
Islam, M.A. 1992: *Bhugol: Dristibhongi O Dorshan*. Department of
Geography, Dhaka University ( in Bangla).
Rashid, K.B.S. *Shangskritic Bhugol:* Bangla Academi, Dhaka ( in Bangla).
Johnston, R. J. et al., edt. 2000. The Dictionary of Human Geography, 4th

Paper Code:213206Marks: 75Credits: 3Class Hours: 45Paper Title:Practical-I

#### (Exam: 50, Lab Notebook: 10, Lab Viva-voce: 5 and Field Report: 10-One Day-long fieldwork)

#### 1. Section I: Cartography (Marks 20)

edn. Blackwell Publishing.

1.1. Definition and Use of Cartography 1.2. Map: Definition, Elements and Importance of Map, Classifications of Maps and their Uses. 1.3. Study of World Physical, Political, Regional and Economic Maps.

- 1.4. Scales: Definition, Representation of Scale, Importance, Classification and there Uses. Draw three from each of the class especially Simple, Diagonal, Comparative, Time, Pace and Unit of Scales.
- 1.5. Measurement of Latitudes, Longitudes and Bearings.
- 1.6. Map, Enlargement, Reduction and Combination.
- 1.7. Measurement of Area and Distance.

## 2. Section II: Application of Cartographic Techniques on Various Statistical Data (Marks 20) 2.1 Line Graph, Bar Graph, Climographs.

- 2.2 Simple and Compound Bar Graph.
- 2.3 Log and Semi-log Graph.
- 2.4 Age-sex Pyramid.
- 2.5 Pie-Diagram.
- 2.6 Methods of Drawing Distribution Maps (Choropleth, Isopleth and Dot Methods; Proportional Squares).

#### **3.** Section III: Identification of Rocks and Minerals (Marks 10)

- 3.1. Definition, Classification and Comparison of Rocks (Igneous, Sedimentary and Metamorphic) and Minerals.
- 3.2. Hardness Scale.

3.3. Physical Identification of Various Types of Rocks and Minerals.

#### **Selected Readings:**

Shingh, R.I. 1998: *Elements of Practical Geography*, India.
Keats, J.S. 1985: *Cartography*, Longman, London.
John, Campbell 1999. *Map Use and Analysis*, Wm. C. Brown Publishers.
Monkhouse, F.J. and Wikinson, F.J. 1976: *Maps and Diagrams*, Harper & Row
Publishers, USA. Robinson, A.H *Elements of Cartography*, New York, John Willy and sons.

Paper Code	211501	<b>Marks: 100</b>	Credits: 4	Class Hours: 60		
Paper Title:	History of the Emergence of Independent Bangladesh					

#### স্বাধীন বাংলাদেশের অভ্যুদয়ের ইতিহাস

ভূমিকা: স্বাধীন বাংলাদেশের অভ্যুদয়ের ইতিহাস-পরিধি ও পরিচিতি

#### ১। দেশ ও জনগোষ্ঠির পরিচয়

- ক) ভূ প্রকৃতির বৈশিষ্ট্য ও প্রভাব
- খ) নৃতাত্ত্বিক গঠন
- গ) ভাষা
- ঘ) সংস্কৃতির সমন্বয়বাদিতা ও ধর্মীয় সহনশীলতা
- ঙ) অভিন বাংলার পরিপ্রেক্ষিতে তৎকালীন পূর্ববঙ্গ ও বর্তমান বাংলাদেশের স্বকীয় সত্তা

#### ২। অখন্ড স্বাধীন বাংলা রাষ্ট্র গঠনের প্রয়াস ও উপমহাদেশের বিভক্তি, ১৯৪৭

- ক) ঔপনিবেশিক শাসন আমলে সাম্প্রদায়িকতার উদ্ভব ও বিস্ণ্ণুর
- খ) লাহোর প্রস্ণ্ডব, ১৯৪০
- গ) অখন্ড স্বাধীন বাংলা রাষ্ট্র গঠনের উদ্যোগ, ১৯৪৭ ও পরিণতি
- ঘ) পাকিস্ণ্ডান সৃষ্টি, ১৯৪৭

#### ৩। পাকিস্ডান: রাষ্ট্রীয় কাঠামো ও বৈষম্য

- ক) কেন্দ্রীয় ও প্রাদেশিক কাঠামো
- খ) সামরিক ও বেসামরিক আমলাতন্ত্রের প্রভাব
- গ) অর্থনৈতিক, সামাজিক ও সাংস্কৃতিক বৈষম্য

#### ৪। ভাষা আন্দোলন ও বাঙালির আত্মপরিচয় প্রতিষ্ঠা

- ক) মুসলিম লীগের শাসন ও গণতান্ত্রিক রাজনীতির সংগ্রাম
- খ) আওয়ামী লীগের প্রতিষ্ঠা, ১৯৪৯
- গ) ভাষা আন্দোলন: পটভূমি ও ঘটনা প্ৰবাহ
- ঘ) হক-ভাসানী-সোহরাওয়ার্দীর যুক্তফ্রন্ট, ১৯৫৪ সালের নির্বাচন ও পরিণতি

#### ৫। সামরিক শাসন: আইয়ুব খান ও ইয়াহিয়া খানের শাসনামল (১৯৫৮-৭১)

- ক) সামরিক শাসনের সংজ্ঞা ও বৈশিষ্ট্য
- খ) আইয়ুব খানের ক্ষমতা দখল ও শাসনের বৈশিষ্ট্য (রাজনৈতিক নিপীড়ন, মৌলিক গণতন্ত্র, ধর্মের রাজনৈতিক ব্যবহার)
- গ) আইয়ুব খানের পতন ও ইয়াহিয়া খানের শাসন, এক ইউনিট বিলুপ্তিকরণ, সার্বজনীন ভোটাধিকার, এলএফও (Legal

#### Framework Order)

#### ৬। জাতীয়তাবাদের বিকাশ ও স্বাধিকার আন্দোলন

- ক) সাংস্কৃতিক আগ্রাসনের বিরণ্রন্দ্ধে প্রতিরোধ ও বাঙালি সংস্কৃতির উজ্জীবন
- খ) শেখ মুজিবুর রহমানের ৬-দফা আন্দোলন
- গ) ৬-দফা আন্দোলনের প্রতিক্রিয়া, গুর<sup>ে</sup>ত্ব ও তাৎপর্য
- ঘ) আগরতলা মামলা, ১৯৬৮

#### ৭। ১৯৬৯-এর গণঅভ্যুত্থান ও ১১-দফা আন্দোলন

- ক) পটভূমি
- খ) আন্দোলনের কর্মসূচী, গুর~ত্ব ও পরিণতি

#### ৮। ১৯৭০ এর নির্বাচন, অসহযোগ আন্দোলন ও বঙ্গবন্ধুর স্বাধীনতা ঘোষণা

- ক) নির্বাচনের ফলাফল এবং তা মেনে নিতে কেন্দ্রের অস্বীকৃতি
- খ) অসহযোগ আন্দোলন, বঙ্গবন্ধুর ৭ই মার্চের ভাষণ, অপারেশন সার্চলাইট
- গ) বঙ্গবন্ধুর স্বাধীনতা ঘোষণা ও গ্রেফতার

#### ৯। মুক্তিযুদ্ধ ১৯৭১

- ক) গণহত্যা, নারী নির্যাতন, শরণার্থী
- খ) বাংলাদেশ সরকার গঠন ও স্বাধীনতার ঘোষণাপত্র
- গ) স্বত:স্ফূর্ত প্রাথমিক প্রতিরোধ ও সংগঠিত প্রতিরোধ (মুক্তিফৌজ, মুক্তিবাহিনী, গেরিলা ও সম্মুখ যুদ্ধ)
- ঘ) মুক্তিযুদ্ধে প্রচার মাধ্যম (স্বাধীন বাংলা বেতার কেন্দ্র, বিদেশী প্রচার মাধ্যম ও জনমত গঠন)
- ঙ) ছাত্র, নারী ও সাধারণ মানুষের অবদান (গণযুদ্ধ)
- চ) মুক্তিযুদ্ধে বৃহৎশক্তি সমূহের ভূমিকা
- ছ) দখলদার বাহিনী, শালিড়্কমিটি, আলবদর, আলশামস, রাজাকার বাহিনী, রাজনৈতিক দল ও দেশীয় অন্যান্য সহযোগীদের স্বাধীনতাবিরোধী কর্মকান্ড ও বুদ্ধিজীবী হত্যা
- জ) পাকিস্তানে বন্দি অবস্থায় বঙ্গবন্ধুর বিচার ও বিশ্বপ্রতিক্রিয়া
- ঝ) প্রবাসী বাঙালি ও বিশ্বের বিভিন্ন দেশের নাগরিক সমাজের ভূমিকা
- **এ**ঃ) মুক্তিযুদ্ধে ভারতের অবদান
- ট) যৌথ বাহিনী গঠন ও বিজয়
- ঠ) স্বাধীনতা সংগ্রামে বঙ্গবন্ধুর নেতৃত্ব

#### ১০। বঙ্গবন্ধু শেখ মুজিবুর রহমানের শাসনকাল, ১৯৭২-১৯৭৫

- ক) স্বদেশ প্রত্যাবর্তন
- খ) সংবিধান প্রণয়ন
- গ) যুদ্ধ বিধ্বস্ডু দেশ পুনর্গঠন
- ঘ) সপরিবারে বঙ্গবন্ধু হত্যা ও আদর্শিক পটপরিবর্তন

## History of the Emergence of Independent Bangladesh

**Introduction:** Scope and description of the emergence of Independent Bangladesh. Writing on this topic.

#### 1. Description of the country and its people.

- a. Geographical features and their influence.
- b. Ethnic composition.
- c. Language.
- d. Cultural syncretism and religious tolerance.
- e. Distinctive identity of Bangladesh in the context of undivided Bangladesh.

#### 2. Proposal for undivided sovereign Bengal and the partition of the Sub Continent, 1947.

- a. Rise of communalism under the colonial rule, Lahore Resolution 1940.
- b. The proposal of Suhrawardi and Sarat Bose for undivided Bengal : consequences
- c. The creation of Pakistan 1947.

#### 3. Pakistan: Structure of the state and disparity.

- a. Central and provincial structure.
- b. Influence of Military and Civil bureaucracy.
- C. Economic , social and cultural disparity

#### 4. Language Movement and quest for Bengali identity

- a. Misrule by Muslim League and Struggle for democratic politics .
- b. The Language Movement: context and phases .
- c. United front of Haque Vasani Suhrawardi: election of 1954, consequences.

#### 5. Military rule: the regimes of Ayub Khan and Yahia Khan (1958-1971)

- a. Definition of military rules and its characteristics.
- b. Ayub Khan's rise to power and characteristics of his rule (Political repression, Basic democracy, Islamisation)
- c. Fall of Ayub Khan and Yahia Khan's rule (Abolition of one unit, universal suffrage, the Legal Framework Order)

#### 6. Rise of nationalism and the Movement for self determination .

- a. Resistance against cultura l aggression and resurgence of Bengali culture.
- b. Sheikh Mujibur Rahman and the six point movement
- c. Reactions : Importance and significance
- d . The Agortola Case 1968.

#### 7. The mass- upsurge of 1969 and 11 point movement: background, programme and significance.

#### 8. Election of 1970 and the Declaration of Independence by Bangobondhu

- a. Election result and centres refusal to comply
- b. The non co-operation movement, the 7<sup>th</sup> March , Address , Operation Searchlight
- c. Declaration of Independence by Bangobondhu and his arrest

#### 9. The war of Liberation 1971

- a. Genocide, repression of women, refugees
- b. Formation of Bangladesh government and proclamation of Independence

c. The spontaneous early resistance and subsequent organized resistance (Mukti Fouz, Mukti Bahini, guerillas and the frontal warfare )

d. Publicity Campaign in the war of Liberation (Shadhin Bangla Betar Kendra, the Campaigns abroad and formation of public opinion )

- e. Contribution of students, women and the masses (Peoples war)
- f. The role of super powers and the Muslim states in the Liberation war.
- g. The Anti-liberation activities of the occupation army, the Peace Committee, Al-Badar, Al-Shams,

Rajakars, pro Pakistan political parties and Pakistani Collaborators , killing of the intellectuals.

- h. Trial of Bangabondhu and reaction of the World Community.
- i. The contribution of India in the Liberation War
- j. Formation of joint command and the Victory
- k. The overall contribution of Bangabondhu in the Independence struggle.

#### 10. The Bangabondhu Regime 1972-1975

- a. Homecoming
- b. Making of the constitution
- c. Reconstruction of the war ravaged country
- d. The murder of Bangabondhu and his family and the ideological turn-around.

#### সহায়ক গ্ৰন্থ

- ১. নীহার রঞ্জন রায়, বাঙালীর ইতিহাস, দে' জ পাবলিশিং, কলকাতা ১৪০২ সাল।
- ২. সালাহ্ উদ্দিন আহমেদ ও অন্যান্য (সম্পাদিত), বাংলাদেশের মুক্তি সংগ্রামের ইতিহাস ১৯৪৭-১৯৭১, আগামী প্রকাশনী, ঢাকা ২০০২।
- সিরাজুল ইসলাম (সম্পাদিত), বাংলাদেশের ইতিহাস ১৭০৪-১৯৭১, ৩ খন্ড, এশিয়াটিক সোসাইটি অব বাংলাদেশ, ঢাকা
   ১৯৯২।
- ৪. ড. হার<sup>-</sup>ন-অর-রশিদ, বাংলাদেশ: রাজনীতি, সরকার ও শাসনতান্ত্রিক উন্নয়ন ১৭৫৭-২০০০, নিউ এজ পাবলিকেশন্স, ঢাকা ২০০১।
- ৫. ড. হার<sup>ে</sup>ন-অর-রশিদ, *বাঙালির রাষ্ট্রচিম্প্র ও স্বাধীন বাংলাদেশের অভ্যদয়,* আগামী প্রকাশনী, ঢাকা ২০০৩।
- ৬. ড. হার<sup>ক্র</sup>ন-অর-রশিদ, *বঙ্গবন্ধুর অসমাপ্ত আত্মজীবনী পুনর্পাঠ,* দি ইউনিভার্সিটি প্রেস লিমিটেড, ঢাকা ২০১৩।
- ৭. ড. আতফুল হাই শিবলী ও ড.মোঃ মাহবুবর রহমান, বাংলাদেশের সাংবিধানিক ইতিহাস ১৭৭৩-১৯৭২, সূবর্ণ প্রকাশন, ঢাকা ২০১৩।
- ৮. মুনতাসির মামুন ও জয়ন্ত কুমার রায়, বাংলাদেশের সিভিল সমাজ প্রতিষ্ঠার সংগ্রাম, অবসর, ঢাকা ২০০৬।

- ৯. আতিউর রহমান, অসহযোগ আন্দোলনের দিনগুলি: মুক্তিযুদ্ধের প্রস্তুতি পর্ব, সাহিত্য প্রকাশ, ঢাকা ১৯৯৮।
- ১০. ড. মোঃ মাহরুবর রহমান, বাংলাদেশের ইতিহাস, ১৯০৫-৪৭, তামলিপি, ঢাকা ২০১১।
- ১১. ড. মোঃ মাহবুবর রহমান, বাংলাদেশের ইতিহাস, ১৯৪৭-১৯৭১, সময় প্রকাশন, ঢাকা ২০১২।
- ১২. সৈয়দ আনোয়ার হোসেন, বাংলাদেশের স্বাধীনতা যুদ্ধে পরাশক্তির ভূমিকা, ডানা প্রকাশনী, ঢাকা ১৯৮২।
- ১৩. আবুল মাল আবদুল মুহিত, বাংলাদেশ: জাতিরাষ্ট্রের উদ্ভব, সাহিত্য প্রকাশ, ঢাকা ২০০০।
- ১৪. শেখ মুজিবুর রহমান, অসমাপ্ত আত্মজীবনী, দি ইউনিভার্সিটি প্রেস লিমিটেড, ঢাকা ২০১২।
- ১৫. সিরাজ উদ্দীন আহমেদ, একাতরের মুক্তিযুদ্ধ: স্বাধীন বাংলাদেশের অভ্যূদয়, ইসলামিক ফাউন্ডেশন, ঢাকা ২০১১।
- ১৬. জয়ন্ত কুমার রায়, বাংলাদেশের রাজনৈতিক ইতিহাস, সুবর্ণ প্রকাশন, ঢাকা ২০১০।
- S9. Harun-or-Roshid, The Foreshadowing of Bangladesh: Bengal Muslim League and Muslim Politics, 1906-1947, The University Press Limited, Dhaka 2012.
- Sb. Rounaq Jahan, Pakistan: Failure in National Integration, The University Press Limited, Dhaka 1977.
- So. Talukder Maniruzzaman, Radical Politics and the Emergence of Bangladesh, Mowla, Brothers, Dhaka 2003.
- ২০. মেসবাহ কামাল ও ঈশানী চক্রবর্তী, *নাচোলের কৃষক বিদ্রোহ, সমকালীন রাজনীতি ও ইলা মিত্র*, উত্তরণ, ঢাকা ২০০৮।
- ২১. মেসবাহ কামাল, আসাদ ও উনসত্তরের গণঅভ্যুত্থান, বিবর্তন, ঢাকা ১৯৮৬।

Paper Code	212807	<b>Marks: 100</b>	Credits: 4	Class Hours: 60
Paper Title:	Chemistry-I			

- 1. **Measurements and the Scientific Method:** Measurements, units, SI units, reliability of measurements precision and accuracy, rounding off, significant figures, significant figures in calculation, mean and median, errors, sources of errors.
- 2. Structure of atom: Atom, isotopes, Atomic masses, Mass spectroscopy, Atomic nucleus, Nuclear binding energy, Nuclear reactions –fission and Fusion reactions, Bohr atom model, Spectrum of atomic hydrogen, Dual nature of electron, Heisenberg uncertainty principle, Quantum numbers, Atomic orbitals, Aufbau principle, Pauli exclusion principle, Hund's rule of maximum multiplicity, Electronic configuration of atoms.
- 3. **Periodic Table:** Periodic law, Periodic table, Electronic configurations from the periodic table, Periodic properties of the elements such as ionization energies, Electron affinity, Electro negativity, Atomic/ionic radius along a period and down a group, Diagonal relationship
- Chemical Bonds: Chemical bond, Types of chemical bonds ionic, Covalent coordination, Metallic, Hydrogen, Polar and no polar covalent bonds, Lewis dot structure, Shapes of molecules, VSEPR theory, Valence bond theory, Hybridization, *6*- and *ð*-bonding in compounds, Molecular orbital theory.
- 5. Oxidation and reduction: Redox reactions, Writing and balancing Redox reactions,

- 6. **States of Matter:** Comparison between solids, Liquids and gases, Changes of state, m.p. and b.p, phase transition, Phase diagram of water.
- 7. **Gaseous and Their Properties:** The gas laws, The perfect gas equation, The kietic theory of gases, Van der waals equations, Real gases, Graham's laws of diffusion and Effusion.
- 8. **Solutions:** Solubility and intermolecular forces, Solubility product, Types of concentration units, Colligative properties of solutions, Henry's law, Nernst distribution law.
- 9. Acids and Bases: Various concepts on acids and bases, Conjugate acids and bases, Neutralization reactions acid- base strength, p<sub>H</sub>, Acid-base titrations, Acid-base indicatiors, Acid-base properties of salts, The common ion effect, Buffer solutions, Hard and soft acids and bases.
- 10. **Chemical Equilibrium:** Reversible reactions and the equilibrium state, The equilibrium law, Reaction quotients and equilibrium constants, Calculations using K<sub>e</sub>, K<sub>p</sub>, Homogeneous and heterogeneous equilibrium, The principle of Le Chatelier and Brown.
- 11. **Hydrocarbons:** Hydrocarbons, Saturated and unsaturated hydrocarbons, Alkanes, Alkenes, And Alkynes, Nomenclature of organic compounds-the IUPAC system natural gas, Petroleum, Petrochemicals.
- 12. **Study of different classes of organic Compounds:** Alcohols, Aldehydes, Ketones, Carboxylic Acids, Esters, Amines and Amides.

#### **Selected Readings:**

- 1. General Chemistry, D. D. Ebbing, Houghton Miffin Co.
- 2. Chemistry The Molecular Nature of Matter and Change, M. Siberberg. WCB /Mc Graw-Hill.
- 3. Introduction to Modern Inogranic Chemistry, S.Z. haider, Friends' International.
- 4. Principles of physical chemistry, M. M. Huque and M. A Nawab, students' publications.
- 5. Essentials of Physical chemistry, B.S Bahl, G.D Tuli and A Bahl, S. Chand & Co.Ltd.
- 6. Advanced Organic Chemistry, B.S. Bahl and A Bahl, S. Chand & Co. Ltd.
- 7. A Level chemistry by C.W. Ramsden
- 8. Organic Chemistry: T Morrison and R.N Boyed,
- 9. Fundamental of Organic Chemistry by W Solomons

Paper Code	212808	Marks: 50	Credits: 2	Class Hours: 30	
Paper Title:	Chemistry Practical-I				

- 1. Preparation of FeSO<sub>4 7H20</sub>. Mohr's salt and potash alum.
- 2. Separation and identification of four radicals from a mixture of anions and cations The cations are pb  $_{2+}$ , cu  $_{2+}$ , Cd  $_{2+}$ , Al  $_{3+}$ , Fe  $_{2+}$ , Fe  $_{3+}$ , Co  $_{2+}$ , Ni<sup>2+</sup> , Zn  $_{2+}$ , Ba  $_{2+}$ , Na  $_{+}$ , K  $_{+}$ , and NH4  $_{+}$ , the anions are NO<sub>3</sub>, CO<sub>32</sub>, SO<sub>4</sub><sup>2-</sup>, Cl , Br and I<sub>+</sub>
- 3. Standardization of NaOH solution using standard oxalic acid solution,
- 4. Determination of Fe<sup>2+</sup> using standard permanganate solution 5. Iodometric determination of copper(II) using standard Na<sub>2</sub>SO3 solution.
- 6. Gravimetric determination of nickel as Ni(HDMG)<sub>2</sub> complex 7. Determination of the enthalpy change for the decomposition sodium dicarb
- Determination of the enthalpy change for the decomposition sodium dicarbonate into sodium carbonate.
- 8. Determination of the  $p_{H}$  neutralization curves of a strong acid by a strong base.

- 9. Investigation of the conductance behaviour of electrolytic solution and applications (acetic acid)
- 10. Determination of the presence of nitrogen, halogen and sulphur in organic compounds.
- 11. Identification of the functional groups (unsaturation, alcohol, phenol, carbonyl, aldehlyde, ketone, carboxylic acid, aromatic amine, amide and nitro- groups) in organic compound.

#### **Selected Readings**

- 1. A Text Book of Quantitative Inorganic Analysis, A.I. Vogel, 3<sup>rd</sup>/4<sup>th</sup> edition, ELBS and Longman Green & Co. Ltd.
- 2. A Text Book of Quantitative Inorganic Analysis, A.I. Vogel 3<sup>rt</sup>/4<sup>th</sup> edition, ELBS and Longman Green & Co. Ltd.
- 3. Practical physical chemistry, A Faraday.
- 4. A Text Book of practical organic chemistry, A.I. vogel, ELBS edition.

Paper Code	213709	<b>Marks: 100</b>	Credits: 4	Class Hours: 60	
Paper Title:	Fundamentals of Mathematics				

- **1. Real Number System:** Field and order properties, Natural numbers, Integers and rational numbers, Absolute value and their properties, Basic inequalities.
- 2. Complex Number System: Field of Complex numbers, De Moivre's theorem and its

applications.

- **3.** Theory of Equations: Relations between roots and coefficients, Symmetric functions of roots, Sum of the powers of roots, Synthetic division, Des Cartes' rule of signs, Multiplicity of roots, Transformation of equations.
- 4. Matrices and Determinants:, Notion of matrix. Types of matrices. Algebra of matrices. Determinant function and its properties. Minors, Cofactors, expansion and evaluation of determinants. Elementary row and column operations and row-reduced echelon matrices. Invertible matrices. Diagonal, triangular and symmetric matrices.
- **5.** System of Linear Equations: System of linear equations (homogeneous and non-homogeneous) and their solutions. Gaussian elimination, Application of matrices and determinants for solving system of linear equations. Applications of system of equations in real life problems.
- 6. Vector Spaces: Euclidean *n*-space. Real vector spaces. Subspaces. Linear combination of vectors. Linear transformation. Kernel and image. Eigenvalues and eigenvectors.
- 7. Two-dimensional Geometry: Transformation of coordinates, Pair of straight lines (homogeneous second degree equations, general second degree equations representing pair of straight lines, angle between pair of straight lines, bisectors of angle between pair of straight lines), General equations of second degree (reduction to standard forms, identifications, properties and tracing of conics).
- 8. Three-dimensional Geometry: Three-dimensional coordinates, Distance, Direction cosines and direction ratios. Planes and straight lines. Vectors in plane and space. Algebra of vectors. Scalar and vector product. Vector equations of straight lines and planes.

#### **Selected Readings**

- 1. S. Bernard & J M Child- Higher algebra.
- 2. Howard Anton & Chris Rorres Elementary Linear Algebra with Application.
- 3. Khosh Mohammad- Analytic Geometry and Vector Analysis.
- 4. Md. Abdur Rahman Linear Algebra

Paper Code	213711	Marks: 50	Credits: 2	Class Hours: 30
Paper Title:	Calculus-I			

**Functions** & **their graphs :** Polynomial and rational functions, logarithmic and exponential functions, trigonometric functions & their inverses, hyperbolic functions & their inverses, combinations of such functions.

**Limit and Continuity:** Definitions and basic theorems on limit and continuity. Limit at infinity & infinite limits, Computation of limits.

**Differentiation:** Tangent lines and rates of change. Definition of derivative. One-sided derivatives. Rules of differentiation . Successive differentiation. Leibnitz's theorem. Related rates. Linear approximations and differentials.

**Applications of Differentiation:** Mean value theorem. Maximum and minimum values of functions. Concavity and points of inflection. Optimization problems.

**Integration:** Antiderivatives and indefinite integrals. Techniques of integration. Definite integration using antiderivatives. Fundamental theorems of calculus. Basic properties of integration. Integration by reduction.

**Applications of Integration:** Arc length. Plane areas. Surfaces of revolution. Volumes of solids of revolution. Volumes by cylindrical shells. Volumes by cross sections.

**Approximation and Series:** Taylor polynomials and series. Convergence of series. Taylor's series. Taylor's theorem and remainders. Differentiation and integration of series.

#### **Books Recommended:**

- 1. Howard Anton -*Calculus* (7<sup>th</sup> and forward editions)
- 2. E.W. Swokowski Calculus with Analytic Geometry.
- 3. Md. A Matin & B Chakraboty, Diferential Calculus.

Paper Code	213007	Marks: 100	Credits: 4	Class Hours:60
Paper Title:	Botany-I			

1. **Introduction:** Origin and evolution of life; differences between plants and animals; modern concepts of classification of living organisms.

#### 2. Microbiology:

- a) Introduction to Viroids, Prions, Rickettsia and Mycoplasms.
- b) Virus: Physical and chemical nature of phage, plant and animal viruses, multiplication of HIV virus and economic importance.
- c) Bacteria: Types, fine structure, reproduction and importance.

- *d)* Fungi: Habitat, characteristics, classification up to class (Alexopoulos), reproduction, importance, life history of *Saccharomyces*.
- e) Cyanobacteria: Habitat, characteristics, structure, importance of Cyanobacteria .
- *f*) Algae: Habitat, characteristics, classification up to class (Fritsch), reproduction, importance; life history of *Oeodogonium*.
- g) Phytoplankton: Habitat, characteristics, classification and importance.
- 3. Lichen: Habitat, characteristics, classification and importance.
- 4. Limnology: Definition, scope, importance and classification of lakes.
- 5. Bryophyta: Habitat, characteristics, classification up to classes and reproduction; life history of *Riccia* and *Anthoceros*.
- 6. Pteridophyta: Habitat, characteristics, classification up to classes, importance; life history of *Selaginella* and *Christella*.
- 7. Gymnosperms: Habitat, characteristics and importance; life history of *Cycas* and *Gnetum*.
- Angiosperms: Habitat, characteristics, ICBN, classification systems of plant kingdom. (Artificial, natural & phylogenetic). Identifying characters and economic importance of the following families: (a) Fabaceae, (b) Solanaceae and (c) Malvaceae and (d) Poaceae.
- 9. Plant Pathology: Concept of diseases in plants, causes, diagnosis, classification and importance of plant diseases, symtomatology and control measures; forecasting of plant diseases.

Causal organisms, symptoms and control measures of brown spot of rice, stem rot of jute, citrus canker and tungro disease of rice.

10. Economic Botany: Local and scientific names, parts used and importance of at least 8 prominent plants of each of the following groups: (a) Food, (b) medicine, (c) timber, (d) fibre, (e) oil and (f) vegetables. Cultivation and processing of tea and rubber.

1.	Agrios, G.N. 1997 :		Plant Pathology (4th ed.). Academic Press, London.
2.	Bold, H.C. and		
	M.J. Wynne. 1978 :		Introduction to the Algae, Prentice Hall, India
3.	Hawker, Lilian, E. 1967	:	Fungi, Hutchinson Univ. Library, Cambridge Univ. Press, London.
4.	Lawrence, G.H.M. 1951	:	Taxonomy of Vascular Plants. The Macmillan Co. New York.
5.	Pelczer, M.J., E.C.S. Chan	:	Microbiology: Concepts and Applications. McGraw Hill Book
	Co. and N.R. Krieg. 1993		Inc. New York.
6.	Vashista, P.C. 1993		Botany for Degree Students: Pteridophyta. S.C. Chand & Co. Ltd. Ramnagar, New Delhi.
7.	Mukherji, H. and Ganguly, 200	00:	Plant Groups, Centrl Book Agency, Calcutta.
8.	Hill,F.A. 1972.		Economic Botany, Tata McGraw-Hill Publishin Company, India.
9.	রায়, শ্যামল কুমার, পাল, নিশীথ কুমার :		অপুষ্পক উদ্ভিদবিজ্ঞান (১ম ও ২য় খন্ড), বাংলা একাডেমী, ঢাকা।
	পাশা, মোস্ড্ফা কামাল, ১৯৯৫		
10.	খান, আজমাজদ আলী এবং তরিকুল ইসলাম	:	স্নাতক উদ্ভিদ বিজ্ঞান ১ম, ২য় ও ৩য় খন্ড।

11. খন্দকার মনির জ্জামান, ১৯৯৪

12. বাসার, এম. এ., এম.এ. হাসান এবং ম. রফিকল ইসলাম, ২০০৪	লিমনোলজী, ঢাকা বিশ্ববিদ্যালয় প্রকাশনা, ঢাকা।
13. হাসান, এম. এ. এবং	উদ্ভিদ বিজ্ঞান, হাসান বুক হাউজ, বাংলা বাজার, ঢাকা।
এম. কে. আলম. ১৯৯৭	উদ্ভিদ শ্রেণী বিন্যাস তত্ত্ব (ওয় সংস্করণ), হাসান বুক হাউস, ঢাকা।
14. খাতুন, রাবেয়া, ২০০২	উদ্ভিদ শ্রেণীবিন্যাস, ইউরেকা বুক এজেসি, রাজশাহী

Paper Code	213008	Marks: 50	Credits: 2	Class Hours:30
Paper Title:	Botany-I Pra	ctical		

06

1. Detail study including dissection (where necessary), mounting, drawing, description and identification with classification of the following genera: 10

Cyanobacteria	:Nostoc, anabaena
Algae	: Saccnaromyces and Accoboius
Bryophyte	: Riccia and Marchantia
Pteridophyte	: Selaginella, Christella
Gymnosperms	: Cycas
Angiosperm	: Poaceae and Fabaceae

2. Identification of the following genera with reasons:

Algae	Volvox, Polysiphonea and Fucas.
Fungi	Rhizopus, A garicus, Puccinia and Penicillium.
Lichen	Crustose, Foliose and Fructose.
Bryophyte	Anthoceros, Semibarbula.
Pteridophyte	Selaginella, Marsilea, Azolla and Pteris
Gymnosperms	Male and female cones of Cycas,
Angiosperms	Scientific names of common plants around the institution.

7. Preparation of herbarium specimens of local plants and submission during examination.

		05
8.	Laboratory Note book.	05

1. Agrios, G.N 1997	: Plant Pathology (4th ed.). Academic Press, London.
2. Bold, H.C. and M.J.Wynne. 1978	: Introduction to the Algae, Prentice Hall, India
3. Devlin, M.R. and H.F. Witham. 1986	: Plant Physiology (4th ed.). CBS Publishers and
	Distributors, New Delhi.
4. Esau,K.1953	: Plant Anatomy. John Wiley & Sons, Inc., New York.
5. Goodwin, T.W. and E.I. Mereer.	: Introduction to Plant Biochemistry (2nd ed.). Pergamon
	Press.
6. Hawker, Lillin, E. 1967	: Fungi, Hutchinson Univ. Library, Cambridge Univ. Press,
	London.
7. Kumar, H.D. 1995	: General Ecology, Vikash Pub. House, India.
8. Lawrence, G.H.M. 1995	: Taxonomy of Vascular Plants. The Macmillan Co. New
	York.
9. Pelczer, M.J., E.C.S. Chan and	
N.R. Krieg.1993	: Microbiology: Concepts and Applications. McGraw Hill
	Book Co. Inc. New York.
10. Vashista, P.C. 1993 Co. Li	: Botany for Degree Students: Pteridophyta. S.C. Chand & d. Ramnagar, New Delhi.
11. পাশা, মোস্ড্ফা কামাল	
রায়, শ্যামল কুমার, ১৯৮৬ 12 আখ্যমার জ্যায়ন ম	: ব্যবহারিক উদ্ভিদবিজ্ঞান, বাংলা একাডেমী, ঢাকা। - বংশগতি বিদ্যা হামান বহু হাটিক, ঢাকা।
12. আখতার ভ্জামান, ম. 13. আখতার জ্জামান, ম. ২০০০	: ববর্তন বাদ, হাসান বুঝ হাউজ, ঢাকা।
14. ইসলাম, এ. এস. ১৯৮৪	: বংশগতি বিদ্যার মূল কথা, বাংলা একাডেমী, ঢাকা।
15. কর্মকার, যদুলাল. ২০০০	: উদ্ভিদ শরীর বিজ্ঞান, হাসান বুক হাউজ, ঢাকা।
16. খান, আমজাদ আলী এবং	
তরিকুল ইসলাম	: স্নাতক উদ্ভিদ বিজ্ঞান ১ম, ২য় ও ৩য় খন্ড।
17. খন্দকার মানর ভ্রামান, ১৯৯৪	: লিমনোলজা, ঢাকা বিশ্ববিদ্যালয় প্রকাশনা, ঢাকা।
18.জামান, এম. এ. ১৯৭৫	: কোষাবদ্যা, বাংলা একাডেমা, ঢাকা।
19. বাসার, এম. এ., এম.এ. হাসান এবং ম. রফিকুল ইসলাম. ২০০৪	: : উদ্ভিদ বিজ্ঞান, হাসান বুক হাউজ, বাংলা বাজার, ঢাকা।
20. হাসান, এম. এ. ১৯৯৬	: বাংলাদেশের ভেষজ উদ্ভিদ, আশরাফিয়া বই ঘর, বাংলা বাজার, ঢাকা।
21. হাসান, এম. এ. এবং	: উদ্ভিদ শ্রেণী বিন্যাস তত্ত্ব (ওয় সংস্করণ), হাসান বুক হাউস, ঢাকা।
এম. কে. আলম. ১৯৯৭	

Paper Code	213105	<b>Marks: 100</b>	Credits: 4	Class Hours: 60
Paper Title:	Zoology -I			

#### Group-A: Introduction to Zoology: Protozoa and non-chordates

**Introduction to Zoology:** Definition and scope of zoology. Foundation of animal life: Level of organization (protoplasmic, cellular, tissue, organ, organ system, organism, species, individual, population, community, fauna, biota, ecosystem, biosphere, biodiversity. Cells: Cell and cell theory, structure and functions of cell organelles. Gametogenesis: Spermatogenesis and oogenesis; placentation. Classification of animals: Animal kingdoms; classification up to phyla on the basis of organization, symmetry, coelom and phylogeny; different taxa and Linnean hierarchy and nomenclature.

**Protozoa and non-chordates:** General characteristics of the following protozoa and non-chordates phyla with examples – Apicomplexa, Ciliophora, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Gastrotricha, Nematomorpha, Rotifera, Acanthocephala, Kinorhyncha, Loricifera, Priapulida, Supuncula, Pogonophora, Tardigrada, Onychophora, Phoronida, Brachiopoda, Bryozoa/Ectoprocta, Chaetognatha, Echinodermata, and Hemichordata.

General and diagnostic characteristics of the following phyla with examples – Sarcomastigophora, Annelida, Arthropoda and Mollusca.

# Type study of the following with their systematic position, habitats, external morphology, organ systems such as digestion, movement, circulation, respiration, excretion, nervous, and reproduction; food and feeding habits, mode of life and development –

- *a.* Phylum Sarcomastigophora: *Euglena*
- b. Phylum Apicomplexa: Eimeria
- c. Phylum Ciliophora: Paramecium
- d. Phylum Porifera: Scypha
- e. Phylum Cnidaria: Obelia
- f. Phylum Nematoda: Ascaris
- g. Phylum Mollusca: Pila
- h. Phylum Arthropoda: Prawn
- *i.* Phylum Echinodermata: *Astropecten*
- *j.* Phylum Hemichordata: *Balanoglossus.*

#### **Group-B: Human Physiology and Applied Zoology**

**Human Physiology:** Outline of the physiology of digestion, blood circulation, respiration, excretion and reproduction; endocrine glands and their functions; vitamins and vitamin deficiency diseases.

**Applied Zoology:** Introduction to the major fields of applied zoology: Entomology, Fisheries Biology, grains. Integrated fish farming: Types, poultry, livestock and paddy-cum-fish culture. Poultry farming: System of poultry farming, diseases of poultry and their control, economic importance of poultry and their impacts on socio-economic condition of Bangladesh.

Paper Code	213106	Marks: 50	Credits: 2	Class Hours: 30
Paper Title:	Zoology Pra	ctical-I		

- **1. Study of museum specimens:** Representative of all major non-chordate phyla (minimum 20 specimens to be studied).
- **2. Study of permanent slides:** Whole mount, body parts and various cells and invertebrate tissues (at least 10 slides to be studied)
- a. Whole animals representatives of protozoans, rotifers and arthropods.
- b. Mouth parts of arthropods.
- c. Parasites nematodes and platyhelminths.
- d. Different larval forms of invertebrates.
- e. Histological slides of invertebrates.

#### 3. Preparation and study of whole mounts of different non-chordates.

## 4. External morphology and dissection of various organ systems of earthworm, cockroach, prawn, *Pila* and *Lamellidens*.

- a. Digestive system of prawn, Pila and Lamellidens.
- b. Circulatory system of earthworm and prawn.
- c. Nervous system of cockroach, grasshopper, prawn, Pila and Lamellidens.

#### 5. Temporary mounting –

- a. Brain of earthworm.
- b. Salivary gland of cockroach.
- c. Statocyst of prawn.

#### 6. Study of appendages of prawn.

#### 7. Animal physiology -

- a. Estimation of blood pressure and pulse rate.
- b. Determination of blood group.

#### 8. Class records.

#### **Distribution of Marks for First Year Final Examination**

- 1. Major dissection (dissection 8 + display 2 + drawing and labeling 3) = 13 marks.
- 3. Spotting of museum specimens 8 items (identification and classification 1 +
  - diagnostic characteristics 1) = **16 marks.** 
    - a. Invertebrate specimens (4 items)  $2 \times 4 = 8$  marks.
    - b. Whole mount slides (mouth parts, parasites, larvae) (2 items)  $2 \times 2 = 4$  marks.
    - c. Histological slides (2 items)  $2 \times 2 = 4$  marks.
- 4. Appendages (detachment, placement and drawing on a paper sheet 3, labeling 2, displaying 1) = 6 marks.

5. Class records = 10 marks.

- 1. C.P. Hickman and L.S Roberts. 1995. Animal Diversity Wm.C. Brown
- 2. L.S. Dillon. 1976. *Animal Variety: An Evolutionary Account:* Wm C. brown Company Publishers, Dubuque, Iwoa.
- 3. J.D. Bernal. 1969. The Origin of Life. Weidenfeld and Nicolson, London.
- 4. E.E. Ruppert and R.D. Barnes. 1994. *Invertebrate Zoology* (6<sup>th</sup> edition). Saunders College Publishingharcourt Brace College Publishers, New York, London
- C.P. Hickman. *Integrated Principles of Zoology*, C.V. Morsby Co. Inc., New York A.J. Marshal and W.D. Williams. *Text Book of Zoollogy Invertebrates*, (edited the 7th edition of Text Book of Zoology, Vol. I,T.J. Parker and W.A. Haswell)
- 6. N.J. Reigle. A Synoptic Introduction to the Animal Kingdom.
- 7. E.O. Wilson, T, Eisner and W.R. Brigges, *Life: Cells, Organisms Populations*. C.C. Chatterjee Human Physiology Vols. I & II
- 8. W.H. Davson . A Text Book of General Physiology
- 9. G.L. Presser and P.A. Brown Comparative Animal Physiology
- 10. B.I. balinsky. An Introduction of Embryology
- 11. D. Dent. Insect Pest Management. Chapman and Hall, London.
- 12. P. Southgalte and J. Lucas (eds), 1998. Aquaculture Fish and Shellfish Farming Fishing News.
- 13. M. King. 1995. Fisheries Biology Assessment and Management. Blackwell Science.
- 14. C.G. Scalet. L.D. Flake and D.W. Willis. 1996. Introduction to Wildlife and Fisheries: An Integrated Approach. W.H. Freeman.
- 15. TVR. Pillay. 1993. Aquaculture: Principles and Practices. Fishing News Books.
- 16. L.P. Pedigo. Entomology and Pest Management.
- 17. R.Wall and D. Shearer, 1997. Vetenerary Entomology. Chapman & Hall
- V.G. Jingran and R.S.V. Pull in 1985. A Hatchery Manual for the Common, Chinese and Indian Major Carps. ADB/ICLARM
- 19. মোঃ আব্দুর রাজ্জাক মিয়া। ২০০৭। পোলট্রি ব্যবস্থাপনা। বাংলা একাডেমী।
- 20. গৌতম বুদ্ধ দাশ। ২০০৪। পোলট্রি উৎপাদন। বাংলা একাডেমী।
- 21. এইচ. এম. মোস্ড্ফা । ১৯৯৪। খামারে হাঁস-মুরগী পালন ও রোগ-ব্যাধির চিকিৎসা। বাংলা একাডেমী।

Paper Code	213607	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Introduction	to Statistics		

- 1. Descriptive Statistics: Statistics-Its nature and some important use, Qualitative and quantitative data, Classification, Tabulation and frequency distribution, Graphical representation of data, Measure of location, Measures of Dispersion, Skewness and Kurtosis, Mathmatical relationtionship among different measures of location, dispersion, Skewness and kurtosis.
- **2. Bivariate Data:** Correlation coefficient, Correlation analysis, The purpose and uses of regression analysis, Simple regression and methods of least squares and estimation of parameters Correlation ratio, Rank correlation, Partial and multiple correlation.

- **3. Elementary Probability:** Meaning of probability, Classical and empirical definitions of Probability, Axiomatic approch of defining probability, Event, Sample space and simple problems of probability, Addition rule, Conditional probability, Multiplication rule and Bayes theorems, The concept of a random variables, Probability function and probability density function, Joint probability function. Marginal and conditional distributions, Statistical independence, Expected value and related theorems, Moment generating function, Common probability distributions, Binomial, Poisson and Normal.
- **4. Index Number:** Concept of an index number and problems in the construction of index number, Types of indices (Price, Quantity, Value and cost of living indices) and their uses, Tests for index numbers.
- **5. Time Series anlysis:** Elements of time-series analysis, Measurement of trend by moving average, By least square method, Trend curve, Determination of seasonal indices, Cylical.
- **6.** Numerical Mathematics: Differences of a polynomial, Finite difference operator, Difference table, Newton's formula and starling's central difference formula, Inverse interpolation, Numerical integration.

#### **Books Recommended:**

<ol> <li>Yule and Kendall</li> <li>Islam, M. Nurul.</li> <li>Jalil A. and Ferdous R.</li> </ol>	<ul><li>: Introduction to Theory of Statistics.</li><li>: An Introduction to Statistics and Probability.</li><li>: Basic Statistics.</li></ul>
<ol> <li>Mostafa M.G.</li> <li>David E.N.</li> </ol>	: Methods of Statistics. : Probability Theory for Statistical Methods.
<ol> <li>Weatherburn C.F.</li> <li>Mosteller, Roure and Thomas</li> <li>Ali A.</li> <li>Mallick, S.A.</li> </ol>	: A First Paper in Mathematical statistics. : Probability with Statistical Applications. : Theory of Statistics Vol. I : সাংখিক গনিত
10. Freeman H. 11. Scarborough 12. David F.N.	<ul> <li>Acturial, Mathematics Vols; I and II</li> <li>Numerical Mathematics.</li> <li>Probability theory for Statistical Methods.</li> </ul>
13. Shil R.N. 14. Feller, W 15. Gupta and Kapoor	<ul><li>: Introduction to Theory of Statistics.</li><li>: Introduction to Statistical Time Series (latest ed.).</li><li>: Applied Statistics.</li></ul>

Paper Code	213608	Marks: 50	Credits: 2	Class Hours: 30
Paper Title:	Statistics Pra	actical-I		

Condensation and tabulation of data, Graphical representation of data, Frequency table, Measures of location, Dispersion, Moments, Skewness and Kurtosis, measures of correlation coefficient, Rank correlation, Fitting of simple regression lines, Fitting of Binomial, Normal and Poisson's distributions, Finding trend values and seasonal variation from time series data by different methods, Calculation of Index numbers and test of index number, Use of Newton's forward and backward formula, Solution of numerical integration.

Paper Code	212009	Marks : 100	Credits : 4	Class Hours : 60
Paper Title	Introducing Sociology		Exam Duration : 4 Hours	

1. **Definition, Nature & Scope of Sociology,** relationship with other social sciences. Development of Sociology: Contributions of Auguste Comte, Herbert Spencer, Emile Durkheim, Max Weber

- 2. **Culture, Beliefs & Values:** Norms, sanctions, symbols, language, subculture, counterculture, hegemony & resistance
- 3. **Globalization, Culture and Society:** Globalization and its different dimensions, Cultural globalization, global culture and social change
- 4. **Urbanization and Social Formation:** Definition of urbanization and urbanism, Process of urbanization in developing societies and social formation, over urbanization, growth of slum & poverty in mega cities
- 5. Gender and Society: DisPaper of WID, WAD and GAD, Why gender is important in the disPaper of development, Gender inequality & women's subjugation in developing societies.
- 6. Environmental Problems, Natural Disasters and Social Crisis: Climate change and its impact on society, Natural disaster, social crisis and vulnerabilities, Climate change, deforestation and mal-development.
- 7. **Social Inequality:** Dimensions of social inequality: Class, gender, age, minority group (religious and indigenous), economic vulnerability, Social inequalities in developed & developing countries.
- 8. **Types of societies:** Marxist view on classifying societies on the basis of type of control over economic resources and Lenski's view on classifying societies by their main means of Subsistance.
- 9. **Deviance & Social Control:** Definition of deviance, theories of deviance. Crime & justice system, agencies of social control.
- 10. **Health, Illness and Society:** Nature & scope of the problem, Urbanizations, acute, chronic & life style diseases, Social, environmental & behavioural factors affecting health, Communicable & behavioural diseases: STD, HIV/AIDS, TB, Hep-B etc

#### Reference Giddens Sociology Tony Bilton et al Introductory Sociology

Paper Code	212111	Marks : 100	Credits : 4	Class Hours : 60
Paper Title	Introduction to	Social Work		Exam Duration : 4 Hours

- 1. Social Work: Meaning, Characteristics, Scope and Importance Relationship of Social Work with other Sciences- Sociology, Economics, Psychology and Political Science.
- 2. Evolution: Evolution of Social Work in UK, USA, India and Bangladesh.
- 3. Social Reformers and their Movements in Pre-partition India and Bangladesh: Raja Rammohan Ray, Ishwar Chandra Vidyasagar, A.K Fazlul Haque, Sir Syad Ahmed, Begum Rokeya.
- 4. Social Legislations Related to Social Security, Women Welfare, Child Welfare.
- 5. Profession and Social Work: Meaning and Characteristics of Profession, Social Work as profession, Philosophical, Religions and Ethical Basis of Social Work.
- 6. Industrial Revolution: Meaning, Impact on Society, Industrialization, Urbanization, Welfare State.
- 7. Social Problems and Social Services in Bangladesh.
- 8. Methods of Social Work: Basic and Auxiliary Methods and their Basic Issues such as Meaning, Elements, Principles and Area of Use. Importance of Social Work Methods in Bangladesh.

- 1. Barker, Robert L. :Social Work Dictionary, 3rd ed. NASW, New York, 1995.
- 2. Coulshed, Veronica Social Work Practice: An Introduction 2nd ed. London. Macmillan, 1991.
- 3. Friedlander, Walter A. : Introduction to Social Welfare. Prentice Hall, 2nd ed. New Delhi-1967.

- 4. Khalid, M. : Welfare State, Karachi, Royal Book, 1968
- 5. Morales, A. And Shaefor, B. Social Work A Profession of many faces, 4th ed. Allyan and Bacan, Boston, 1986.

Paper Code	211909	Marks : 100	Credits : 4	Class Hours : 60
Paper Title	Introduction (	to Political Theo	Exam Duration : 4 Hours	

**Political Science :** Meaning, Nature, Scope, Methods, Relations to other Social Sciences, Importance to Study Political Science.

**State :** Definition, Elements, State and Government, State and Individual, State and Society, Theories of the origin of the state.

**Fundamental concepts :** Sovereignty, Law, Liberty, Equality, Rights and Duties, Nation, Nationalism, Internationalism.

Concepts of Political Sociology : Political culture, elite theory, Max Weber and Bureaucracy

**Political Thinkers :** Plato, Aristotle, St. Augustine, St. Thomas Aquinas, Machiavelli, Hobbes, Locke and Rousseau.

- 1. R.G. Gettell : Political Science
- 2. J. W. Garner : Political Science and Government
- 3. R. M. MacIver : The Modern State
- 4. G.H. Sabine : A History of Political Theory
- 5. William Ebenstein : Great Political Thinkers-Plato to the Present
- 6. H.G. Laski : A Grammar of Politics
- ৭. মুহাম্মদ আয়েশ উদ্দীন : *রাষ্ট্রচিম্ণ্ডু পরিচিতি*
- ৮. এমাজউদ্দিন আহমদ : মধ্যযুগের রাষ্ট্রচিম্দ্র
- ৯. মোঃ দরবেশ আলী খান : পেণ্চটো ও এরিস্টটলের রাজনৈতিক চিম্দ্র
- ১০. সরদার ফজলুল করিম : *পেণ্ডটোর রিপাবলিক*

Paper Code	213905	<b>Marks: 100</b>	Credits: 4	Class Hours: 60
Paper Title:	Introduction	to Psychology		

- 1. **Introduction:** Definition and nature of Psychology; Psychology as a science; Fields of Psychology; Definition, scope and subject mater of social Psychology. Methods used in Psychology: Experimental, Observational, Clinical, Case histories, Survey method, Sociometry.
- 2. **Biological Basis of Behavior:** The Major division of Nervous System: The central Nervous System-Brain and Spinal Cord; The Peripheral Nervous System-Somatic and Autonomic System.
- 3. **Perception:** Definition of perception; Organization of perception; Depth perception; Illusion and hallucination.
- 4. **Motivation and Emotion:** Definition of motivation; Motivational cycle; Classification of motives-Primary and Secondary motives; Bodily changes in emotion.

- 5. **Learning:** Definition and factors of learning; Processes of learning: Trial and Error learning, Classical conditioning and Operant conditioning; Insightful learning.
- 6. **Memory and Forgetting:** Definition of Memory and forgetting; Ways of measuring memory; General causes of forgetting; Techniques of improving memory.
- 7. **Intelligence:** Definition of Intelligence; Measurement of intelligence-Stanford-Binet intelligence scale and Wechsler intelligence scale.
- 8. **Personality:** Definition of Personality: Measuring personality: Observation, Rating, Inventories, Projective techniques.

**References** (Introduction to Psychology)

- আফসার উদ্দীন এম ২০০২ সাধারণ <sup>ম</sup>নোবিজ্ঞান। রাজশাহী ঃ রাজশাহী বিশ্ববিদ্যাল<sup>য়</sup> প্রকাশনা বোর্ড।
- Crider, A.B., Goethals, G.R. Robert D. Kavanaugh.R.D. Solomon, P.R. Psychology, Scott Foresman (1993), Psychology (4<sup>st</sup> ed.) New York; Harper Collins College publishers.
- 3. Feldman, R.S. (2002), Understanding Psychology (6<sup>54</sup> ed.) New York; Mc Graw Hill; Hisher education.
- 4. Hilgrad, E.R., Alkimson, R., and Alkinson. R.C. Introduction to Psychology. New York;
- 5. Huffman K. (2004) Psychology in Action (7<sup>™</sup> ed.) U.S.A.; John Wiley and Sons Inc.
- ৬. <sup>ম</sup>ন্ডল, যোগেঁদ্র ক<sup>ম</sup>ার (২০০৮): সাধারণ <sup>ম</sup>নোবিজ্ঞান; হাসান বুক হাউজ, ঢাকা।
- 7. Morgan, C.T. and King, R.A Wisz, J.R. and Shoopier C. (1966) Introduction to Psychology. New York. Mc Graw Hill, Latest ed.
- 8. Munn. N.L. (1969) Introduction to Psychology; D Boston, Houghton Miffin Co.
- 9. Newman, P.R. and Newman, B.M. (1983) Principles of Psychology; Illionis Homewood: The Dorsey Press, Latest ed.
- 10. Zimbardo, P.G (1979), Psychology and life: Scott, Foresman and Co. (Latest Edition to be followed.)

Paper Code	212209	<b>Marks: 100</b>	Credits: 4	Class Hours: 60
Paper Title:	Principles of	Economics		

- **1. Fundamentals of Economics:** Definition, Nature and Scope of Economics, Scarcity of Resources, Various forms of Economic Organization, Three Fundamental Problems of Economics, Production Possibility Frontier, Opportunity Cost, Efficiency and Equity.
- 2. Supply and Demand: Demand and Quantity Demanded, Demand Schedule, Demand Curve, Supply and Quantity Supplied, Supply Schedule, Supply Curve, Equilibrium of Supply and Demand, Movement along the Supply and Demand Curve and Shift of Supply and Demand Curve and Its Effects on Equilibrium Price and Quantity. Elasticity of Supply and Demand; Determinants of Elasticity of Demand.
- **3. The Theory of Consumer Behavior:** Total and Marginal Utility; Law of Diminishing Marginal Utility, Equi-Marginal Utility; Consumer Surplus.

- **4. Production and Cost:** Production Function and Technology; Production with One Variable Input; Production with Two Variable Inputs; Returns to Scale; Costs in the Short-run; Costs in the Long-run.
- 5. Market Analysis:
  - A. **Perfect Competition:** Characteristics of Perfect Competition; Average and Marginal Revenue; Individual and Market Supply; Short-run equilibrium of a competitive firm Long run Equilibrium under Perfect Competition.
  - B. **Monopoly:** Average and Marginal Revenue; Supply Curve of the Monopolist; Perfect Competition and Monopoly Compared;
- **6. Overview of Macro Economics:** Objective and Instruments of Macroeconomics, National Income Accounting, Gross Domestic Product, Problem of Double Counting, Net Domestic Product, Gross National Product, From GDP to Disposable Income, Net Economic Welfare (NEW).
- **7. International Trade:** Domestic Vs. International Trade-Balance of Trade Vs. Balance of Payment-Trend of Changes in International Trade of Bangladesh. Free Trade Vs. Protection, Comparative Advantage Theory.

8. Growth and Development: Economic Development and Economic Growth, Measurement of

- 9. **Money:** Definition and Functions of Money-Importance of Money in Modern Economy-Different Concepts of Money (M1, M2, M3)-Value of Money. Concept, Causes and Effects of Inflation and Deflation.
- 10. **Government Revenue and Expenditure:** Difference between Public Sector and Private Sector finance, Different Sources of Govt. Revenues, Taxation and Different Kinds of Taxes, Definition of Revenue Budget, Development Budget, Revenue Budget Vs. Development Budget, Surplus, Deficit and Balanced Budget.

- 1. N. Gregory Mankiw. Principles of Economics. Any Late Edition. South We stern College.
- 2. Michael Parkin. Economics. Any Late Edition. Prentice and Hall.
- 3. Karl Case and Ray Fair. Principles of Economics. Any Late Edition. Prentice and Hall.
- 4. Paul Samuelson and William Nordhaus. Economics. Any Late Edition. McGraw Hill.