

NATIONAL UNIVERSITY



Second Year Syllabus Department of Psychology

Four Year B.Sc. Honours Course
Effective from the Session : 2013–2014

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

SECOND YEAR

Paper Code	Paper Title	Marks	Credits
223401	Developmental Psychology-I	100	4
223403	Statistics in Psychology-I	100	4
223405	Psychological Testing	100	4
223406	Practical Experiment: (Marks Distribution)	100	4
	Laboratory Note Book - 20		
	Conduction - 20		
	Report/Script - 35		
	Viva - 25		
Any three subjects from the following			
222009	Sociology of Bangladesh	100×3 =300	4×3 =12
222115	Or Bangladesh Society and Culture		
221909	Political Organization and Political System of UK and USA		
221709	Bangladesh Philosophy		
222209	Or Bangladesh Economy		
223707	Calculus-II		
223609	Or Methods of Statistics		
223107	Zoology-II		
223201	Or Geomorphology		
225021	Structured Programming Language		
	Total =	700	28
221109	English (Compulsory)	100	Non-credit

Detailed Syllabus

Paper Code	223401	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Developmental Psychology-I			

- 1. Introduction**
 - 1.1 Definition of developmental psychology
 - 1.2 Meaning of developmental change
 - 1.3 Types & rate of change
 - 1.4 Revision of the life cycle
 - 1.5 Principles of development
- 2. Developmental determinants**
 - 2.1 Biological determinants
 - 2.2 Environmental determinants
- 3. Research methods in developmental psychology**
 - 3.1 Body Biographic
 - 3.2 Case study method
 - 3.3 Questionnaires
 - 3.4 Interview Method
 - 3.5 Twin studies
 - 3.6 Longitudinal Method
 - 3.7 Cross-sectional Method
- 4. Prenatal Development**
 - 4.1 How life begins
 - 4.2 Three stages of prenatal development
 - 4.3 Factors influencing prenatal development
 - 4.4 Maternal factors
 - 4.5 Environmental factors
- 5. The Birth and Neonate**
 - 5.1 The birth process
 - 5.2 Types of birth
 - 5.3 Birth complications
 - 5.4 Adjustment of a neonate
 - 5.5 Characteristics of a neonate
 - 5.6 Physiological functioning
 - 5.7 Sensory capacities
 - 5.8 Behavioral capacities
- 6. Babyhood**
 - 6.1 Characteristics of babyhood
 - 6.2 Physical development
 - 6.3 Motor development

- 6.4 Language development
- 6.5 Emotional development
- 6.6 Social development

7. Childhood

- 7.1 Physical development
 - 7.1.1 Body growth
- 7.2 Motor development
 - 7.2.1 The Paper of motor development
 - 7.2.2 Handedness
 - 7.2.3 Play
 - 7.2.4 Types of play
 - 7.2.5 Importance of play
- 7.3 Language development
 - 7.3.1 Developmental Paper of language
 - 7.3.2 Speech disorder
- 7.4 Emotional development
 - 7.4.1 Factors influencing emotional development
 - 7.4.2 Basic emotions
- 7.5 Social Development
 - 7.5.1 Processes in social development
 - 7.5.2 Family influences
 - 7.5.3 Social influences
- 7.6 Moral development
 - 7.6.1 Paige's theory of moral development
 - 7.6.2 Kohlberg's theory of moral development
 - 7.6.3 Learning moral behavior
 - 7.6.4 Role of reward and punishment.

8. Adolescence

- 8.1 The physical changes of adolescents
- 8.2 The stages of puberty
- 8.3 Growth spurt in height & weight
- 8.4 Hormonal controls
- 8.5 Primary sex characteristics
- 8.6 Secondary sex characteristics
- 8.7 Psychological effects of physical changes
- 8.8 Developmental tasks of adolescence

Books Recommended:

1. Alison, C.S Susan, F. and Joanne, C. (1958): Child Development : A topical Approach. John Wiley & Sons.
2. Ambron, J.R. and brodzinsky, D. (1979): life span human development. Holt, Rinchart and winston
3. বানু, সুলতানা (১৯৯২): বিকাশ মনোবিজ্ঞান (১ম খন্ড), বাংলা একাডেমি, ঢাকা।
4. হক, মোঃ আমিনুল (২০০৪) বিকাশ মনোবিজ্ঞান, হাসান বুক হাউস, ঢাকা।

5. Hurlock, E.B (1978): Child Development. Megraw Hill Book Co, New York.
6. Hurlock E.B (1987): Developmental Psychology. McGraw Hiss Book CO, New York.
7. Sarafino, E.P and Armstrong, J.W (1980) Child and Adolescent Development. Seott. Foresman and Co.
8. সুলতানা, কাজী আফিফা (২০০১): বিকাশ মনোবিজ্ঞান, পজিট্রন পাবলিকেশন, ঢাকা।
9. Wastson, R.I and Lindgren, H.C (1983), The Psychology of the child. John wiley and sons
10. জামান সুলতান এবং বানু, সুলতানা (১৯৯৮): মানব বিকাশে মনোবিজ্ঞান। লেখকদ্বয় কর্তৃক প্রকাশিত, ঢাকা।

Paper Code	223403	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Statistics in Psychology-I			

1. Definition, Nature and scope of statistics, Types of statistics, Uses of statistics in Psychology.
2. Frequency distribution: Groping of data, Choosing class interval, Apparent and True limits of class interval, Number of class interval, types of distribution.
3. Graphical Representation of Data: Histogram, Frequency Polygon, Bar diagram, Pie Chart, Cumulative Frequency polygon, Cumulative percentage curve or ogive
4. Measures of central Tendency: Computing mean, Median and mode; when to apply mean, Median and mode, Mathematical Properties of mean.
5. Measures of variability: Need to measure variability. The Range, mean Deviation, Varianc and standard deviation, quartile deviation
6. Measures of skewness and kurtosis
7. Score Transformation: Docile, Percentile point and percentile Rank, T-Score, Z-Score, Stanine Score
8. Correlation and regression: Meaning, Types and uses of correlation, Pearson product-Moment conflation, Spearman's Rank correlation, Scatter diagram, Regression Equations, Multiple correlation and Regression.

Suggested Readings:

1. Garrett. H.E.: Statistics in Psychology and Education: Vakils Feffer and Simons Private Ltd. Bombay
2. Hays.W.L: Statistics for Social Science: Holt Rinehart and Winston. N.Y
3. Lindley D.V.: Introduction to Probability and Statistics: C.U.P London.
4. Stilson D.W.: Probability and statistics in Psychology Research and Theory. Holder day. San Francisco
5. Wolf, F.L: Elements of Probability and statistics. McGraw Hill: N.Y
6. Bhattacharyyc. G.K & Jhonson. R.A (1977). Statistical Conceopts and Methodsd. New Youk: John Wiley & Sons.
7. Bland M. (1995). An Introduction to Medical Statistics (2nd Ed.) New York. Oxford University Press : Chapter-8
8. Blommers. p. & Lindquist. E.F (1960) Elementary Statistic a Methods in psychology and Education. Calcutta: Oxford Book & Sty Co

9. Dowdy. S & Wearden. S (1983). Statistics for each. New York. John Wiley & Sons.
10. Ferguson. G.A & Takane, Y. (1989). Statistical Analysis in Psychology and Education (6th Floor) New York. McGraw-Hill Book Co
11. Garrett.H.E (1966) Statistics in Psychology and Education (6th Ed.) London; Longmans, Green & Co. Ltd.
12. Glasnapp, D.R & Poggio, J.P (1985) Essentials of Statistical Analysis for the Behavioral Science Columbus; Charles E. Merrill Publishing Co
13. Siggel. S. & Castellan; N.J(1988) Nonparall... Statistics for the Behavioral Science (2nd Ed) New York; McGraw-Hill Book Co
14. Spigel.M.R (1992) Theory and Problems of Statistics (2nd Ed. in St Units). London; McGraw Hill International Ltd

Paper Code	223405	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Psychological Testing			

- 1. Nature and use of Psychological test**
 - 1.1 Definition of psychological test and testing
 - 1.2 Current uses of psychological test
 - 1.3 Psychometric tests versus psychometric questionnaires
 - 1.4 Types of psychometric tests
 - 1.4.1 Tests of Attainment
 - 1.4.2 Test of General Intelligence
 - 1.4.3 Test of Special Ability or Aptitude
 - 1.4.4 Test Batteries
 - 1.5 Types of Psychometric Questionnaires
 - 1.5.1 Personality Questionnaires
 - 1.5.2 Interest Questionnaires
 - 1.5.3 Values Questionnaires
- 2. Designing and writing Items**
 - 2.1 Empirical Theoretical and rational approaches to item construction
 - 2.2 Liberating search
 - 2.3 Subject matter experts
 - 2.4 Writing items : Guiding rules, number of items
- 3. Designing and scoring responses:**
 - 3.1 Open-ended response
 - 3.2 Closed ended response
- 4. Collecting Data**
 - 4.1 Collecting data for Pilot testing of items
 - 4.2 Collecting data for field testing

- 4.3 Sizes
- 5. Analyzing Items**
 - 5.1 Item Difficulty Index
 - 5.2 Item Endorsement Index
 - 5.3 Item Discrimination
 - 5.3.1 Item Discrimination Index
 - 5.3.2 Upper Lower Index (ULI)
 - 5.3.3 Item Discrimination Coefficient
- 6. Assessing Reliability :**
 - 6.1 Test Retest Reliability
 - 6.2 Split-half Reliability
 - 6.3 Parallel Forms Reliability
 - 6.4 Internal Consistency Reliability
- 7. Assessing Validity**
 - 7.1 Defining Validity
 - 7.2 Aspects of Validity
 - 7.2.1 Face Validity
 - 7.2.2 Content Related evidence for validity
 - 7.2.3 Criterion Related evidence for validity
 - 7.2.4 Construct Related evidence for validity
 - 7.2.5 Relationship between Reliability and validity
- 8. Norms and the Meaning of test scores**
 - 8.1 Statistical concepts
 - 8.2 Developmental norms
 - 8.3 Within group norms
 - 8.4 Relativity of norms

References:

- Anastasi, A (1976) Psychological Testing (2nd Ed) New York: Macmillan.
- Anastasi, A. Urbina, S (1997) Psychological Testing Delhi: Pearson Education.
- Cohen, R. J.k & Swerdlik, M.E (2005) Psychological Testing and Assessment. New York: McGraw- H
- Cronbach, L.j ()1966) Essentials of psychological Testing. New York: Harper & Row Publishers
- Kaplan, R.M., Saccuzzo, D.P (2001) Psychological Testing (5th Ed) New Delhi: Replica Press Pvt Ltd
- Kline, T.J.B (2005) Psychological Testing. New Delhi: Vistaar Publications.
- Thorndike, R.L & Hagen E.p (1977) Measurement and evaluation in psychology and education (4th ed) New York; Wiley.
- নীহাররঞ্জন সরকার (২০০৮) মনোবৈজ্ঞানিক পরিমাপন ও পরিসংখ্যান। বাংলাবাজার, ঢাকা: জ্ঞানকোষ।

Paper Code	223406	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Practical (Experiment)			

Any Six of the following experiments

1. To study the effect of set on problem solving behaviors.
2. To study the effect of Knowledge of results on level of aspiration.
3. To study the effect of proactive inhibition on paired associate learning
4. To investigate the phenomenon of Muller-Lyer illusion.
5. To study the associative reaction time under free versus controlled situation
6. To measure DL for lifted weights by the method of limits.
7. To study two point tactile discrimination by the methods of limits.
8. To study von-Steinbock's effect on serial learning
9. To study the Zeigarnik effect.
10. To Study the effect of over learning on retention.

Marks distribution

a. laboratory note book-	20
b. Experiment	
i) Conduction	20
ii) Report/Script	35
c. Viva	25
Total	100

Paper Code	222009	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Sociology of Bangladesh			

1. **The Sociology Background of Bangladesh Society:** The Ecological Background Context-The Nature of Village Society-Religion, Culture & Ethnicity-The British Colonialism and its impact-Pakistan era: the internal colonialism-emergence of Bangladesh: Language Movement-Historic speech of Sheikh Mujib on 7th March 1971-Liberation War.
2. **Population and Ethnicity:** Population composition: age-sex-marital status-literacy-labor force-Population change: fertility-mortality-migration and population control-Ethnic groups in Bangladesh.
3. **Marriage, Family and Socialization:** Changing pattern of marriage and divorce-Changing patterns of family and kinship –Cultural change and nature of socialization.

4. **Economy of Bangladesh:** Real economy: farm and non-farm activities-problems of agrarian transformation-Urban Economy: industrial growth-working class-underclass-Informal economy. Problems of industrialization-Migration: Rural-urban migration. International migration: remittance economy.
5. **Social Inequality and Poverty:** Nature of social inequality in Bangladesh-Income inequality, gender inequality, ethnic inequality, status inequality-Growth and nature of middle class-Poverty trends.
6. **Politics:** Nature of the state, bureaucracy and political parties in Bangladesh-Political culture-governance problems in Bangladesh-Local governments in Bangladesh.
7. **Rural Society and Urbanization:** Agrarian structure: Land tenure and class structure-Community and power structure: samaj- salish- patron- client relationship.
8. **Crime and Deviance:** Pattern and forms of crime in Bangladesh-Penology and correctional methods in Bangladesh-Policy, Civil Society and prevention of crime in Bangladesh.
9. **Culture:** Pattern of religious beliefs and rituals in Bangladesh-Social groups and language-Pattern of cultural change: modernization-Problems of cultural identity: role of language, religion and ethics-Globalization of culture: cultural dependency-local culture.
10. **Education:** Structure of education: Primary-Secondary-Higher Education and social structure: differential access to education-class and social mobility-socialization and social control-Changing pattern of education: Institutional expansion-changes in curriculum-enrollment-dropout-Education policy: problems and prospects.

Books Recommended:

1. Nazmul Karim, Dynamics of Bangladesh Society
2. A. M. Chowdhury and Fakrul Alam (eds.), Bangladesh at the Threshold of the Twenty-first Century, Dhaka: Asiatic Society, 2002
3. Anwarullah Chowdhury, Agrarian Social Relations and Rural Development in Bangladesh, New Delhi, Oxford/IBH
4. Kamal Siddiqui, Jagatpur, Dhaka:UPL, 2000
5. Ashabur Rahman, Bangladesher Krishi Kathamo, UPL, 1986
6. Akbar Ali Khan, Discovery of Bangladesh, Dhaka, UPL, 1996.

Paper Code	222115	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Bangladesh Society and Culture			

1. Social and cultural background of Bangladesh society: People, Language, Ethnicity and Patterns of rural and urban community.
2. Social institution, organization, Family, Marriage, Kinship, etc.
3. Agrarian social structure, Land tenure system and land reforms, Agrarian relations and modes of production in Bangladesh. New method of farming, Rural electricity and communication network and their impact on social structure.
4. Rural power-structure, Formal and informal power-structure, Changing power-structure and leadership in contemporary Bangladesh.
5. Social rank and social stratification, Social class, Status groups, Caste and class, New urban class, Civil society, Intelligentsia, etc.
6. Ethnicity and Tribal society in Bangladesh, Changes in Tribal societies, Major factors of change missing action exposure to media, politicisation and expansion of education.
7. Bangladesh society and culture in transition, Current trend, Impact of urbanization, industrialization on contemporary Bangladesh society and culture.
8. Rural development programmes in Bangladesh, Role of NGO and government organization for social development.
9. Women and cultural change: Attempts of women empowerment from local level to national level, Emerging new roles, Participation in public affairs, Special programme of women development, Enterprising urban women, Women rights and awareness building by GO and NGOs. Special programmes for mother and child health education.
10. The religion of the majority, Islamic norms and values, views and practices in societal level, Islamic education vs secular education, Islam and political mobilization, Modernising factors inherent in and Islamic culture.

Books Recommended:

1. Ahmed, Karmruddin : *Social History of Bangladesh*
2. Ester Boserup : *Women's Role in Economic Development*
3. Gunsen, Eric : *Rural Bangladesh Society*

4. Irene Tinker : *Women and World Development*
5. Islam, Md. Nural : *Role of Agriculture in Socio-economic Development*
6. Islam, Md. Nural : *Social Mobility and Elite Formation in Rural Society of Bangladesh*
7. Karim, Nazmul : *Dynamics of Bangladesh Society*
8. Margaret Mead : *Male and Female: A Study of the sexes in Changing world*
9. R.K. Mukherjee : *The Dynamics of Rural Society*
10. Salma Sobhan : *Legal Status of Women in Bangladesh*
11. Sen, Rangalal : *Political Elite in Bangladesh*
12. UNESCO : *Women in South Asia.*
13. Westergard : *Rural Society. State & Class in Bangladesh*
14. Women for Women : *Situation of Women in Bangladesh*
15. Women for Women : *Women for Women in Bangladesh*
16. Hunter, W.W. : *The Indian Musalmans*
১৭. বদরউদ্দীন উমর : *চিরস্থায়ী বন্দোবস্ত বাংলাদেশের কৃষক*
১৮. অনুপম সেন : *বাংলাদেশ: রাষ্ট্র ও সমাজ*
১৯. আবুল মনসুর আহমেদ : *বাংলাদেশের কালচার*
২০. আবদুল মওদুদ : *মধ্যবিত্ত সমাজের ক্রমবিকাশ*

Paper Code	221909	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Political Organization and the Political System of UK and USA			

1. **Constitution:** Meaning and significance, Classification, Methods of Establishing Constitution, Requisites of a good Constitution.
2. **Forms of Government:** The Concept of Traditional and Modern Forms, Democracy, Dictatorship, Parliamentary, Presidential, Unitary and Federal.
3. **Theory of Separation of Power:** Meaning, Significance and Working.
4. **Organs of Government:** Legislature, Executive, Judiciary and Electorate.
5. **Political Behaviour:** Political Parties, Pressure Groups and Public Opinion.
6. **British Political System:** Nature, Features and Sources of the Constitution, Conventions, Monarchy, Parliament, The Prime Minister and the Cabinet, Party System.
7. **American Political System:** Nature and Features of the Constitution, The System of Checks and Balances, The President and Congress, Judiciary and Political Parties.

Books Recommended:

1. K.C. Wheare : *Modern Constitution*
2. K. C. Wheare : *Federal Government*
3. W.F. Willoughby : *The Government of Modern State*
4. C.F. Strong : *Modern Constitution*
5. R.M. Mac Iver : *The Web of Government*
7. ড. মোঃ মকসুদুর রহমান : রাষ্ট্রীয় সংগঠনের রূপরেখা
8. ড. ওদুদ ভূঁইয়া : রাষ্ট্রবিজ্ঞান
9. বিপুল রঞ্জন নাথ : রাষ্ট্রীয় সংগঠন
10. নির্মল কান্তি ঘোষ : আধুনিক রাষ্ট্রবিজ্ঞানের ভূমিকা

Paper Code	221709	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Bangladesh Philosophy			

Origin, nature, scope and characteristics of Bangladesh Philosophy.

Influence of Sufism, Vaishnavism and Baulism in Bangladesh Philosophy.

Trends of Bangladesh Philosophy in the nineteenth and twentieth century.

Contribution of the following thinkers to Bangladesh Philosophy: Rabindranath Tagore, Kazi Nazrul Islam, Mohammad Barkatullah, Abul Hossain, Kazi Abdul Wadud, Dr. G.C. Dev, Begum Rokeya.

Books : Recommended :

1. আমিনুল ইসলাম : *বাঙালির দর্শন : প্রাচীনকাল থেকে সমকাল*, মাওলা ব্রাদার্স, ঢাকা, ২০০২
2. আহমদ শরীফ : *বাঙালীর দর্শন চিন্তা*, মাওলা ব্রাদার্স, ঢাকা, ২০০২
3. এম. মতিউর রহমান : *বাঙালির দর্শন : মানুষ ও সমাজ*, বাংলা একাডেমী, ঢাকা ২০০০, ২য় সংস্করণ, ঢাকা : অবসর প্রকাশনা সংস্থা, ২০১২
4. — : *বাংলার দার্শনিক মনীষা* : ঢাকা : জাতীয় সাহিত্য প্রকাশ, ২০০৮
5. — (সম্পাদিত) : *রবীন্দ্র দর্শন: মানুষ ও সমাজ*, প্রথম খণ্ড, ঢাকা : নবযুগ, ২০১৩
6. ওয়াকিল আহম্মদ (সম্পাদিত): *বাঙালির দর্শন চিন্তা*, এশিয়াটিক সোসাইটি অব বাংলাদেশ, ১৯৯২
7. মোঃ নূরনবী (অনূদিত) : *ড. জি.সি দেব : সাধারণের আশা-আকাঙ্ক্ষা*, ঢাকা : আইডিয়াল লাইব্রেরি, ২০০১

8. মোহাম্মদ বরকতউল্লাহ : মানুষের ধর্ম, ঢাকা : হাওলাদার প্রকাশনী, ২০১১
9. মোঃ সোলায়মান আলী সরকার: বাঙলার বাউল দর্শন, বাংলা একাডেমী, ঢাকা, ১৯৯৩
10. — : লালন শাহের দর্শন, বাংলা একাডেমী, ঢাকা, ১৯৯৪
11. রাধা গোবিন্দ নাথ : গৌড়ীয় বৈষ্ণব দর্শন, কলিকাতা, ১৯৫৮
12. শরীফ হারুন (সম্পাদিত) : বাংলাদেশ দর্শন : ঐতিহ্য ও প্রকৃতি অনুসন্ধান, বাংলা একাডেমী, ঢাকা, ১৯৯৪
13. হাসান আজিজুল হক (সম্পাদিত) : গোবিন্দচন্দ্র দেব রচনাবলী, তৃতীয় খণ্ড, বাংলা একাডেমী, ঢাকা, ১৯৭৯
14. Chowdhury, S.L. : *Introducing Nazrul Islam*, Dhaka, 1983
15. Haque, M.E. : *A Short History of Sufism in Bengal*, Dhaka, 1975
16. Roy, M.N. : *Radical Humanism*, Chicago, 1937

Paper Code	222209	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Bangladesh Economy			

1. **Macroeconomic Situation:** Bangladesh Economy: Growth, Savings and Investment-Inflation-Fiscal Sector-Monetary and Financial Sector-Money & Credit, Interest Rate, Capital Markets-External Sector: Exports, Imports, Expatriate Employment & Remittances, Balance of Payments, Foreign Exchange Reserve, Exchange Rate- Medium Term Macro Economic Framework-Reform Programs-Agriculture-Industry-State-Owned Enterprises-Power & Energy-Transport & Communication-Human Resource Development-Poverty Alleviation-Private Sector Development-Environment & Development.
2. **GDP, Saving and Investment:** Sector wise Growth of GDP-Savings-Investment.
3. **Prices, Wages and Employment:** Consumer Price Index & Inflation-Wage-Labor Force & Employment-Overseas Employment and Remittances.
4. **Fiscal Policy and Management:** Fiscal Policy-Government Receipts-Tax Management-Revenue Collection Activities-Public Expenditure-Expenditure under ADP-Composition of ADP Expenditure by Major Sectors-Budget Balance and Financing-Resources for ADP-Public Debt Management.
5. **Monetary Management and Financial Market Development:** Monetary Policy & Monetary Management-Money & Credit Situation-Financial Market Management-Banking Sector-Non-Banking Financial Institutions-Interest Rate Movement-Financing in Agriculture, Industry & SMEs - Financial Sector Management and Policy Reforms-Capital Market & Capital Market Scenario.
6. **External Sector:** World Trade Scenario-Export and Import Policy, Simplification of Tariff Structure-Reduction of Tariff-Export Policy-Steps towards Export Development-World Trade Organization and Bangladesh-Regional Trade Agreement: APTA, SAFTA, BIMSTECFTA, TPS-OIC, D-8,

SAPTA, Balance of Payments-Export Position and Composition of Export Commodities, Country wise Export Earnings-Country wise Import Payment-Exchange Rate Policy-Foreign Exchange Reserve.

7. **Agriculture:** Management of Agriculture: Food Grains Production-Food Budget-Seed and Planning Materials-Fertilizer-Irrigation-Agricultural Credit-Budget Allocation for Agricultural Sector-Development Activities in Agriculture, Fisheries and Livestock Sector.
8. **Industry:** Size and Growth Rate of Manufacturing Sector-Quantum Index of Production of manufacturing Industries-SMEs-BSCIC-Production Performance of State Owned Enterprises (SOEs)-Reform programs in State Owned Industrial Sector-Industrial Investment Status: Industrial Loan-Bangladesh Export Processing Zones.
9. **State Owned Enterprises:** Non-Financial Public Enterprises of Bangladesh-Production and Factor Income of SOE Sector-Net profit/Loss-Contribution to public Exchequer-Government Grant/Subsidy-Debt Service Liabilities-Bank Loan-Financial Performance of SOE Sector.
10. **Power and Energy:** Contribution of Electricity in GDP and its Growth Rate-Present Power Generation Scenario-Transmission and Distribution-Power generation program-Transmission System-Energy Efficiency and Energy Conservation.
11. **Transport and Communication:** Road and Highways-Activities of Bridges Division- Bangladesh Railway-Water Transport-Air Transport-Information and Communication-Postal Service.
12. **Human Development:** Human Development and public Outlay for the social Sector-Education and Technology-Women Development-ICT Program and Education-Education Policy 2010-Health Sector Development-Women and Children Affairs-Social Welfare Activities-Youth and Sports-Cultural Affairs-Labor and Employment.
13. **Poverty Alleviation:** Attainment of Millennium Development Goals-Poverty Reduction Strategy Framework-Measurement of the incidence of Poverty in Bangladesh-Trends of Poverty-Poverty Alleviation Programs. Employment generation program for the poorest-Activities of the Department of Cooperatives-Information and Communication Technology (ICT) for Poverty Alleviation.
14. **Private Sector Development:** Developing a Private Investment Friendly Environment-Industrial Reforms-Investment Scenario-Privatization of State Owned Enterprise-Public Private Partnership-Privatization activities in various sectors in the economy.
15. **Environment and Development:** World Environment Movement-Kyoto Protocol-Clean Development Mechanism (CDM) Activities-The Major Environmental Problems of Bangladesh-The Government Initiatives to Address Environmental Protection and Development-Climate Change and state of Vulnerability of Bangladesh.

Books Recommended

Islam, Mujahidul, S. M., Bangladesh Economy (Latest Edition)

References:

1. Bangladesh Economic Review (Latest Edition), Ministry of Finance
2. Annual Report, Bangladesh Bank (Current Issue)
3. The Millennium Development Goals, Bangladesh Progress Report, GED, Planning Commission, BBS
4. World Economic Outlook, April 2011, IMF

Paper Code	223707	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Calculus- II			

- 1. Vector valued functions of a single variable:** Limits. Derivatives and integrals. Tangent lines to graphs of such functions. Arc length from vector viewpoint. Arc length parametrization .
- 2. Curvature of space curves:** Definition. Curves of zero curvature. Curves of constant non-zero curvature. Cartesian equations and parametric equations. Radius of curvature. Centre of curvature.
- 3. Functions of several variables:** Limits and continuity. Partial derivatives. Differentiability, linearization and differentials. The chain rule. Partial derivatives with constrained variables. Directional derivatives, gradient vectors and tangent planes. Extreme values and saddle points of functions of several variables. Lagrange multipliers. Taylor's formula.
- 4. Multiple Integration:** Double integrals and iterated integrals. Double integrals over nonrectangular regions. Double integrals in polar coordinates. Area by double integrals. Triple integrals and iterated integrals. Volume as a triple integral. Triple integral in cylindrical and spherical coordinates. General multiple integrals. Jacobians.
- 5. Topics in Vector Calculus:** Scalar and vector fields, Gradient, divergence and curl, and their properties. Line integrals, Independence of paths. Green's theorem. Surface integrals. Stokes' theorem. The divergence theorem.

Recommended :

1. Howard Anton-*Calculus 5/E (and forward edition)*

Paper Code	223609	Marks: 100	Credits:4	Class Hours: 60
Paper Title:	Methods of Statistics			

- 1. Sampling Distribution:** Concept of sampling distribution of Statistics and its standard error, χ^2 , t and F statistics and their distributions, properties and uses of these distributions.
- 2. Design of Experiment:** Principles of experimental design and analysis of variance, Meaning of experiments and randomization, Replication and local control, Basic designs: CRD, RBD and LSD, Analysis of these designs, Estimation of parameters,

Missing plot estimation and analysis, Factorial experiment, 2_2 , 2_3 factorial experiments, Analysis and interpretation of these designs.

3. **Survey Methods:** Concept of population, Sample, Sampling, Types of sampling, Principles of random sampling, Census and surveys, Advantages and limitations of sample survey over census, Sampling frame. Sampling and non-sampling errors, Detailed study of simple random sampling, Stratified random sampling, Systematic sampling and cluster sampling, Concept of quota sampling, Multistage sampling.
4. **Test of Hypothesis:** Concept of test of hypothesis, Logic behind tests of hypothesis, Neyman Pearson's approach of testing hypothesis, Preliminaries of tests: Hypothesis, Null and alternative hypotheses, Simple and composite hypotheses, Concept of test of significance, Procedures of testing a hypothesis, Test errors, 2 Level of significance, One-tailed and two-tailed tests, P-value. Concept of test statistics: Normal, χ^2 , t and F statistics.
5. Testing the significance of a single mean, Single variance, Single proportion, Difference of two means and two proportions, Ratio of two variances and their confidence intervals, Confidence intervals concerning simple correlation coefficient and regression coefficient for single and double sample, Paired t-test, Testing the homogeneity of several population means, Variance and proportions, Test of goodness of fit.

Books Recommended :

1. David F.N. : Probability theory for statistical Methods
2. Levy H, and Roth L : Elements of Probability
3. Mostafa M.G. : Methods of Statistics
4. Islam M.N. : Introduction to Statistics and probability.
5. Kapoor; Saxena : Mathematical Statistics
6. Ali A. : Theory of statistics Vol. I
7. Mood, Graybill and Boes : Introduction to the Theory of Statistics 3rd Ed.
8. Hogg, R.V. and Craig, A.T. : An introduction to Mathematical Statistics.
4. Federer : Experimental Design; Theory and Applications.
5. Mallick S .A. : Parikkaneer Design.
6. Bhuiyan M.R. : Fundamentals of Experimental Design.
7. Anderson, R.L. and Bancroft. T.A. : Statistical Theory in Research
8. Mood and Graybill : Introduction to the Theory of Statistics
9. Weather Burn C.E. : A First Paper in Mathematical Statistics
10. Cochran G.W. : Sampling Techniques

Paper Code	223107	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Zoology -II			

Group – A: Chordates:

(50 Marks)

1. Broad classification of the following up to order with general and diagnostic characteristics of each taxonomic category with examples (preferably local) and affinities-

Chondrichthyes, Osteichthyes, Amphibia, Reptilia, Aves and Mammalia.

2. Type study of the following with their systematic position, habitats, distribution, external morphology, anatomy including skeletal, digestive, circulatory, respiratory, excretory, nervous, reproductive and endocrine systems; food & feeding habits and mode of life -
- a. Urachordata : *Ascidia*
 - b. Cephalochordata : *Branchiostoma*
 - c. Cephalaspimorpha: *Petromyzon*
 - d. Chondrichthyes : *Scoliodon*
 - e. Osteichthyes : *Labeo rohita*
 - f. Amphibia : *Bufo/Rana*
 - g. Reptilia : *Hemidactylus*
 - h. Aves : *Columba livia*
 - i. Mammalia : *Cavia porcellus*.

Group – B

Palaeontology, Zoogeography, Ecology, (50 Marks)

Genetics & Animal Breeding and Applied Zoology:

Palaeontology:

Geological time table; palaeontological history of Horse & Man.

Zoogeography:

Zoogeographical regions and sub-regions of the world: Nearctic Region, Ethiopian Region, Neotropical

Region-their boundaries, physical characteristics, climatic conditions, vegetation and fauna.

Ecology:

Marine ecology; Zonations and Animal Adaptation to Different Zonations; Concept of Biodiversity; Conservation of Natural Resources; Concept and Classification of Resources; Renewable and Non-Renewable Resources.

Animal Genetics & Animal Breeding:

Modification of Mendelian ratio with animal examples; multiple alleles and pseudoalleles; mutation; chromosomal inheritance of sex determination.

Applied Zoology :

1. **Introduction to the major fields of Applied Zoology:** Entomology, Fisheries, Wildlife Biology, Parasitology and others.
2. **Agricultural Pests:** Major Pests of Rice, Jute, Sugarcane & stored grain.
3. **Integrated Fish Farming:** Types; Poultry, Livestock and Paddy-cum -Fish Culture.
4. **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.

Books Recommended

1. D. Webster and M. Webster. 1974. *Comparative Vertebrate Morphology*, Academic Press New York.
2. I. Young. 1981. *Life of Vertebrates*. OUP, USA
3. K.V. Kardong. 1997. *Vertebrates: Comparative Anatomy, Function, Evolution* Wm. C. Brown
4. S. Stearus and R. Hoekstra. 2000. *Evolution An Introduction* OUP USA
5. A.J.Cain 1996. *Animal Species and Their Evolution* Princeton UP. USA
6. A.M. Davis. *An introduction to palacontology*
7. S. Bengtson. 1995 *Early Life on Earth* Columbia UP, USA
8. R.S. Lull. 1976. *Organic Evolution* Seema Publishing Delhi 11007
9. P.J. Darlington. 1998. *Zoogeography. The Geographical Distribution of Animals*. Krieger. USA
10. M. Begon J.L. Harper and C.R. Townsend. 1996. *Ecology. Individuals Populations*.
11. E.P. Odan *Fundamentalsof Ecology*. Saunders. Philadelphia
12. E.W. Sinnott. L.C. Dunn and Dobzhansky *Principles of Genetics*. McGraw Hill Book Co. New York
13. R.E. Weaver and P.W. Hedrick 1995. *Basic Genetics* Wm. C. Brown Publisher. Dubuque. Iowa.
14. E. Mayr and P.D. Ashlock. 1997. *Principles of Syatematic Zoology* McGraw Hill
15. Kapoor. *Taxonomy*
16. Dennis S. Hill 1997. *The economic importance of insects* (1st edition)Chapman and Half. London
17. D. Dent. *Pest Management* Chapman & Hall London
18. P.Southgate and J.Lucas (Editors), 1998. *Aquaculture: Fish and Shellfish Farming* Fishing News.
19. A Midlen and T.A. Reading 1998. *Pollution Control and Environmental Management for Aquaculture*. Chapman & hall
20. M.R. Ross. 1996. *Fisheries Conservation and Management* Prentice Hall

21. R.Wall and D. Shearer, 1997 *Veternary Entomology* Chapman & Hall
22. V.G. Jhingran and R.S.V. Pullin 1985. *A Hatchery Manual for the Common Chinese and Indian Major Carps*. ADB/ICLARM
23. T.V.R Pillay. 1993. *Aquaculture Principles and Practices* Fishing News Books.
24. J.E. Bardach J.H. Ryther and W.O. McLarney. 1972. *Aquaculture The Farming and Husbandry of Freshwater and Marine Organisms*. John Wiley & Sons.
25. B. Groombridge (Editor). *Global Biodiversity-status of the Earth's Living Resources*. Chapman and Hall London.
26. K.J. Gaston and J.I. Spicer. 1998 *Biodiversity An Introduction* Blackwell Science.
27. M. Jeffries. 1997. *Biodiversity and Conservation*. Routledge
28. O.S. Owen, Natural Resource Conservation. *An Ecological Approach* Macmillan Publishing Co. Inc.
29. P. Wathern (Editor). 1990. *Environmental Impact Assessment: Theory and Practice*, Routledge.
30. P.S. Maitland and N.C. Morgan. 1997. *Conservation Management of Freshwater Habitats: Lakes. Rivers and Wetlands*. Chapman & Hall
31. S.M. Manton and M.E. Brown 1969. *A Manual of Practical Vertebrate Morphology*. Oxford Univ. Press, London
32. W.F Walker. 1980. *Vertebrate Dissection*. W.B. Saunders Co. London.

Paper Code	223201	Marks: 100	Credits: 4	Class Hours: 60
Paper Title	Geomorphology			

1. **Introduction:** Definitions, concepts, scope and methods of explanation in Geomorphology; Form, process and pattern; Application of geomorphological knowledge to study environmental problems.
2. **Development of Geomorphological Thoughts:** Pre-Davisian Geomorphology; Davisian Cycle of Erosion; Penck's and King's concepts; Morphometric and morphoclimatic regions.
3. **Geomorphological Processes and Landforms:** Development of slope, Mass wasting, Landslides, Transportation of eroded materials; Folding and faulting, Volcanoes and volcanic landform, Earthquake.
4. **The Humid Geomorphic Environment:** Characteristics of humid environment; Stream process; Origin & evolution of rill, gullies, drainage pattern; Channel types; Erosion, transportation and deposition; Stream flow, velocity and discharge; Floods (types, causes, discharge, consequence, flood control and management); Floodplain

(morphology, erosional and depositional features, floodplain ecology, floodplain management).

5. **The Arid and Semi-arid Geomorphic Environment:** Desert or arid and semi-arid environments; Fluvial process in arid /semi-arid environment; Wind and aeolian landforms.
6. **The Glacial and Periglacial Geomorphic Environments:** Glacial and periglacial environments; Process and products; Erosional and depositional features.
7. **Karst Topography:** Conditions for karst development; Karst features.
8. **The Coastal Geomorphic Environment:** Classification and delineation of coast; Geomorphic processes and products; Waves, tides, winds, and ocean current; Coastal landforms (erosional and depositional); Deltas (types, formation and structures).
9. **Palaeo-Geomorphology:** Definition, concept, scope and importance; Methods of reconstruction.
9. **Geomorphology of Bangladesh:** Geomorphological evolution of Bangladesh; Quaternary sedimentary sequences; Geomorphology and human settlement.

Selected Readings:

1. Thornbury, W. D. Principles of Geomorphology
2. Sharma, V. K., Geomorphology: Earth Surface, Process and Forms.
3. Small, R. J., The Study of Landforms.
4. Sparks, B. W., Geomorphology.
5. Chorley et. al., Geomorphology.
6. Sabindra Singh, 2010. Geomorphology, India
7. Embleton, C & Thomas J., Process in Geomorphology.
8. Islam. M.S. Sea Level Changes in Bangladesh: Last Ten Thousand Years, Asiatic Society of Bangladesh, Dhaka.

Paper Code	225021	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Structured Programming Language			Exam. Duration: 4 Hours

Computer programming techniques: Flowchart, Pseudocode and Algorithm; Structured programming language: data types, operators, expressions; control structures; functions and program structure: parameter passing conventions, scope rules and storage classes, recursion; header files; preprocessor; pointers and arrays; strings; multidimensional array; dynamic memory allocation; linked list: single linked list, double linked list, circular linked list; user defined data types: structures, unions, enumerations; bitwise operations; input and output: standard input and output, formatted input and output; error handling; file access; variable length argument list; command line parameters; error handling; graphics; linking; library functions.

Reference languages: C.

Reference Books:

- 1) B. S. Gottfried, *Shaum's Outline of Theory and Problems of Programming with C*, McGraw Hill, 3rd edition.
- 2) Herbert Schildt, *Teach Yourself C*, Published by Osborne, 3rd Edition.

Paper Code	221109	Marks: 100	Non-Credit	Class Hours: 60
Paper Title:	English (Compulsory)			Exam Duration: 4

Aims and objectives of this Paper:

To develop students' English language skills, to enable them to benefit personally and professionally. The four skills ~ listening, speaking, reading and writing will be integrated to encourage better language use.

1. Reading and understanding 5×4=20

Students will be expected to read passages they might come across in their everyday life, such as newspapers, magazines, general books etc. Simple stories will also be included to give students a familiarity with different uses of the language.

[N.B. : 5 Questions are to be answered. Each question will carry 4 marks.
There may be division in each question]

- a) Understanding different purposes and types of readings
- b) Guessing word-meaning in context.
- c) Understanding long sentences
- d) Recognizing main ideas and supporting ideas.
- e) Answering comprehension questions.
- f) Writing summaries.

2. Writing 40

- a) Writing correct sentences, completing sentences and combining sentences.
5
- b) Situational writing : Posters, notices, slogans, memos, advertisements etc.
4
- c) Paragraph writing : Structure of a paragraph; topic sentences; developing ideas; writing a conclusion; types of paragraphs (narrative, descriptive, expository, persuasive); techniques of paragraph development (such as listing, cause and effect, comparison and contrast).

8

Or,

- d) Newspaper writing : Reports, press releases dialogues etc.
- e) Writing resumes. **Or,**

8

- f) Writing letters : Formal and informal letters, letters to the editor, request letters, job applications, complaint letters etc.
- g) Essay : Generating ideas; outlining; writing a thesis sentence; writing the essay: writing introductions, developing ideas, writing conclusions; revising and editing.

15

3. Grammar

25

- a) Word order of sentences.
- b) Framing questions.
- c) Tenses, articles, subject-verb agreement, noun-pronoun agreement, verbs, phrasal verbs, conditionals, prepositions and prepositional phrases, infinitives, participles, gerunds. (Knowledge of grammar will be tested through contextualised passages).
- d) Punctuation.

4. **Developing vocabulary** : Using the dictionary, suffixes, prefixes, synonyms, antonyms, changing word forms (from verb to noun etc.) and using them in sentences.

10

5. **Translation from Bengali to English** : 1x 5=5

6. **Speaking skills** : Speaking skills should be integrated with writing and reading in classroom activities.

The English sound system; pronunciation skills; the IPA system; problem sounds, vowels, consonants and diphthongs; lexical and syntactic stress.

(Writing dialogue and practising it orally students can develop their speaking skill. Dialogue writing can be an item in writing test.)