

FYUP Course Outline for Semester II

S. No.	Course Code	Course Title	Credits	Category
1	MTH151C	Calculus II	4	Major
2	ACT151C	Accounting II	4	Minor Interdisciplinary
3	x	x	x	Minor Vocational
4		Student to choose	3	Multidisciplinary
5		Kashmiri Language	3	Ability Enhancement
6	MTH190C	VBA in Excel	2	Skill Enhancement
7	EVS150V	Environmental Science	2	Value-added
		Understanding India	2	

B.Sc. Mathematical Sciences- FYUP

Course Title	: Calculus-II	Semester: 2 nd
Course Code	: MTH151C	Category: Major
Credits	: 4	

Course Objective: Introduce students to calculate derivatives efficiently, use derivatives to solve authentic real-life application problems, use of definite integrals and the fundamental theorem of Calculus to find areas and total change.

Unit I: Applications of integration, areas between curves, volumes, volumes by disks and cylindrical shells, arc length.

Unit II: Strategy for integration, integration by parts, trigonometric integrals, trigonometric substitution, integration of rational functions by partial fractions, improper integrals

Unit III: Infinite sequences and series, convergence of a series, divergence test, integral and comparison tests, alternating series, absolute convergence, ratio and root tests, power series, Taylor and Maclaurin series.

Unit IV: Parametric equations, calculus with parametric curves, polar coordinates.

Textbook:

1. Calculus – Early Transcendentals by James Stewart

Supplementary books:

1. Calculus by Thomas and Finney. Morgan Kaufmann Pub.
2. A First Course in Calculus - by Serge Lang,
3. Calculus – by Howard Anton
4. Integral Calculus - by Hari Krishan
5. Calculus I & II by Tom Apostol

B.Sc. Mathematical Sciences- FYUP

Course Title: Accounting-II
Course Code: ACT151C
Credits: 4

Semester: 2nd
Category: Minor Interdisciplinary

Objectives:

The aim of this subject is to provide a basic understanding of corporate finance including knowledge of the instruments used by companies to raise finances. To provide the ability to interpret the accounts and financial statements of companies and financial institutions.

Unit 1: Business owner and Taxation:

Types of business entity- the sole trader, the partnership, the limited company and the limited liability partnership. Pros and cons of limited companies. Medium-term company finance- hire purchase, credit sale, leasing, bank loans. Short-term company finance - bank overdrafts, trade credit, factoring, bills of exchange, commercial paper. Personal taxation, Company taxation, Capital gains tax, Double taxation relief

Unit 2: Financial instruments:

Loan capital (Debt), Debenture stocks, Unsecured loan stocks, Subordinated debt, Eurobond loan capital, Floating-rate notes, Share capital- Ordinary shares ("Equities") and Preference shares, Convertibles, Warrants, Options issued by companies, Winding up a company.

Unit 3: Depreciation and valuation of Goodwill and shares:

Concept of depreciation, Causes of depreciation, Depreciation accounting, Methods of depreciation – Fixed instalment method and Diminishing Balance method. Valuation of Goodwill - Average profit method, Super Profit Method, Capitalization Method, Annuity Method. Valuation of share-Assets Approach.

Unit 4: Financial Statement:

Definitions of Financial statement, Nature, Attributes, objectives, importance and limitations of financial statements. Trading account, Importance of trading account, Profit and loss account, Nature and importance of profit and loss account. Balance sheet, Characteristics of Balance sheet, Classification of assets and liabilities, Grouping and marshalling of assets and liabilities

References:

1. Antony R.N. & Recce J.S. "Accounting -Test & Cases", Richard Irwan. Inc. Home Wood Illionois.
2. Aulandam & Raman "Advanced Accounting" Himalyan Pub. House Mumbai.
3. Gupta R.L. & Radhaswamy. M. "Advanced Accounting" Sultan Chand & Sons.New Delhi.
4. Maheswari. S.N "Financial Accounting" Vikas Publishing House. New Delhi.
5. Mukherjee & Hanif"Modern Accounting" Tata McGraw Hill
7. Actuarial material (CT2)
8. Anne Britton, Chris waterston "Financial Accounting", Pearson Education, 2009.

B.Sc. Mathematical Sciences- FYUP

Course Title: Environmental Policies and Citizen Sciences

Semester: 2nd

Course Code: EVS151M

Category: Multidisciplinary

Credits: 3

Course Objective: *This paper will help the students to understand key governance and policy interventions needed to improve the wellbeing of the environment. This course will also highlight the role of citizens and eco-movements to achieve the objectives of sustainability.*

Course Outcomes:

- I. *Explain the scientific basis of the global environmental issues, including the technical options available for avoiding or contending with each problem*
- II. *Demonstrate a comprehensive understanding of laws and policies both at the national and international level relating to environment*
- III. *To understand the role of citizens in decision-making at all levels.*

Course Content:

UNIT I: GLOBAL ENVIRONMENTAL ISSUES

Global warming and climate change, Food security, Human population explosion, Desertification, Ozone layer depletion, Acid precipitation, Global biodiversity loss, Nuclear accidents and Holocaust.

UNIT II: ENVIRONMENTAL GOVERNANCE AND POLICY

Concept of environmental governance and environmental literacy, Environmental governance at global level (institutional arrangements), Role of NGO's and corporate in environmental decision making, Constitutional provisions for environmental protection (article 21, 48A, 51A (g)), National Environment Policy-2006.

UNIT-III: ENVIRONMENTALISM, CITIZEN SCIENCE AND SUSTAINABILITY

History and development of environmentalism (Biocentrism, Anthropocentrism, Eco centrisism), Environmental movements (Greenbelt movement, Chipko, Narmada bachao andolan), Role of citizen science to foster environmental protection, Concept of Environmental justice and stewardship, Ecological footprint and sustainability.

Skill Development Activities:

1. Students are expected to investigate local environmental issues

Suggested Readings:

1. Benny Joseph, "Environmental Studies", Tata Mc Graw Hill Publishing Co. Ltd, New Delhi, 1st Edition, 2006.
2. Erach Bharucha, "Textbook of Environmental Studies for Under Graduate Courses", Orient Black Swan, 2nd Edition, 2013.
3. P. D Sharma, "Ecology and Environment", Rastogi Publications, New Delhi, 12th Edition, 2015.
4. S. K. Agarwal, "Global Warming and Climate Change", A.P.H. Publishing Corporation, 2004.
5. Krishnamurthy, K.V, "Text book on Biodiversity", Science Publishers, New Hampshire, 2003.
6. S. C. Santra, "Environmental Science" New Central Book Agency, 3rd Edition 2017.
7. Michael Allaby, "Basics of Environmental Science", Routledge, 2nd Edition 2000.
8. P.S. Aaradhana, Population Ecology.
9. Environmental Education (Scientific, Social and Legal Aspects): H. M. Dami
10. Environmental Problems, Policies and Strategies: Jai Prakash; S. K. Srivastava.

B.Sc. Mathematical Sciences- FYUP

Course Title	: VBA in Excel	Semester: 2 nd
Course Code	: MTH190C	Category: Skill Enhancement
Credit hrs.	: 2	

Course Objective: Introduces the students, VBA applicability of statistical and actuarial calculations using excel data tool pack.

Course Outcome: After completing this course, the student will be able to:

- a) Write and apply user defined functions (UDFs).
- b) Record, write, edit, test and run VBA macros.
- c) Automate repetitive Excel business tasks and streamline workflow.

Syllabus:

Unit I:

Introduction to VBA and excel macro recorder, basic VBA syntax and programming concepts, creating and running macros, debugging and error handling in VBA, VBA variables and rules for creating variables, syntax for VBA variable. Data types in VBA, declaring and using VBA variables/constants. Use & Types of Arrays in VBA, arithmetic and logical operators in VBA. Developer tab, developer button, VBA codes for basic financial functions (EMI, PMT, SI, CI, PF, FV), OFFSET function in VBA. Addition/deletion of sheets using VBA. Writing output, message boxes and dialog boxes in VBA.

Unit II:

Working with external data sources (e.g. databases), automating excel tasks using VBA to automate tasks such as formatting, filtering and sorting data. Using VBA coding for charts, developing VBA codes for calculating basic descriptive statistics such as mean, variance, standard deviation and correlation coefficient. Using loops and arrays to calculate descriptive statistics for multiple datasets. Using VBA to perform regression and correlation analysis. VBA for solving linear programming problems arising in business and finance.

Textbooks:

1. Chapra, S. C. (2010). *Introduction to VBA for Excel*. Prentice Hall.
2. Fairhurst, D. S. (2019). *Using Excel for business and financial modelling: A practical guide*. John Wiley & Sons.
3. Jelen, B., & Syrstad, T. (2010). *VBA and macros: Microsoft Excel 2010*. Pearson Education.
4. Mathematical Modeling with Excel by B. Albright.

B.Sc. Mathematical Sciences- FYUP

Course Title: Environmental Studies

Semester: 2nd

Course Code: EVS150V

Category: Value added

Credits: 2

Learning objectives: This course attempts to create pro-environment attitude and a behavioural pattern in student community and society that attaches importance and priority to create sustainable life style and awareness on various environmental issues.

Learning outcomes: This course is expected to inculcate a critical thinking on various dimensions of environment through knowledge, skill, critical thinking and problem-solving.

Course Content:

Unit 1: Understanding the Environment

- 1.1. Environment: concept, importance and components
- 1.2. Ecosystem: Concept, structure and function (food chain, food web, ecological pyramids and energy flow)
- 1.3. Ecosystem services: (Provisioning, regulating and cultural)
- 1.4. Biodiversity: levels, values and threats and conservation
- 1.5. Concept and objectives of environmental education, environmental ethics

Unit 2: Natural resources and Environmental pollution

- 2.1. Natural resources: Renewable and non-renewable (Global status, distribution and production)
- 2.2. Management of natural resources: Individual, community and government managed
- 2.3. Air, water and soil pollution: Causes, consequences and control
- 2.4. Solid waste management: Collection, segregation, transportation and disposal; 3R's
- 2.5. Climate change: Causes and consequences

Suggested Readings:

1. Asthana, D. K. Text Book of Environmental Studies. S. Chand Publishing.
2. Basu, M., Xavier, S. Fundamentals of Environmental Studies, Cambridge University Press, India.
3. Basu, R. N., (Ed.) Environment. University of Calcutta, Kolkata.
4. Bharucha, E. Textbook of Environmental Studies for Undergraduate Courses. Universities Press.
5. Miller T.O. Jr., Environmental Science, Wadsworth Publishing Co.
6. Wagner K.D. Environmental Management. W.B. Saunders Co. Philadelphia, USA 499p.
7. Mckinnon, M.L. & Schoch. R.M. Environmental Science systems & Solutions. Web enhanced edition. 639p.