SCHOOL OF MATHEMATICAL SCIENCES
Bachelor in Mathematical Sciences (B.Math.Sc.)

Course of Study

Code No.: MSEC 401   Full Marks: 75
Paper: **Principle of Economics II (Macro)**   Pass Marks: 30
Nature: Theory   Credit: 3

Course Description:

> The course covers to Government, Markets and Firms, International Trade, Macroeconomic environment, Balance of Payments and Exchange Rates, Money and Interest Rates, Business Activity, Unemployment and Inflation, Demand-Side and Supply-Side Macroeconomic Policies

Learning Objectives:

> On successful completion of the course the student will be able to introduce the core economic principles and how these can be used in a business environment to help decision making and behavior. It provides the fundamental concepts of macroeconomics that explain how economic agents make decisions and how these decisions interact. It explores the principles underlying macroeconomics that explain how the economic system works, where it fails and how decisions taken by economic agents affect the economic system.

Mode of Delivery:

> The course will be taught by lecture (48 hrs), and problem solving and class discussion (24 hrs). The use of spreadsheet software for problem solving will be encouraged.

Contents:

Unit 1 Government, Markets and Firms 9 hrs

> Reasons for government intervention in the market, The Extent to which businesses meet the interests of consumers and society in general, Perfect markets, Social efficiency, Externalities and inefficient markets, Ways and drawbacks of government intervention in markets, Taxation and regulation for correcting markets' shortcomings. Relationship between the government and individual firm, Targets of "competition policy", Extent to which competition policy is effective, Failure of a free market in achieving the optimal amount of research and development, Various forms of intervention for encouraging technological advance and innovation.

Unit 2 International Trade 6 hrs

> Globalization and multinational business, Impact of globalization on business, Driving force of globalization process, Importance of international trade, The growth of international trade and its benefits to countries and firms, Advantages of specialization, Trade restriction and protection of domestic industries, Role of the World Trade Organization (WTO) in international trade.

Unit 3 Macroeconomic Environment 8 hrs

> Macroeconomic environment of the business, Main macroeconomic variables that governments seek to control, Determining force for the business climate, Effect of stimulating economy on

business output, Actual and potential growths, Economic growths, Relationship between economic growth and environmental sustainability, Periods of boom and periods of recession in economy, Determining factors which influence the length and magnitude of the phases of a business cycle, Causes and costs of unemployment, Unemployment and the level of business activity, The price level in economy and a simple AS-AD model, Causes and costs of inflation, Inflation and the level of business activity, GDP and its measurement, Simple model of the circular flow of income representing the economy.

Unit 4 Balance of Payments and Exchange Rates   **5 hrs**
Balance of payments and effect of trade and financial movements on it, Exchange rates, Effect of changes in exchange rates on business, Balance of payments and exchange rates, Advantages and disadvantages of fixed and floating exchange rates, Governments and/or central banks intervention on the exchange rates, Implications of such actions for other macroeconomic policies and business, Monetary union and single currencies with reference to the European Economic and Monetary Union, Exchange Rate Mechanism and creation of a single currency.

Unit 5 Money and Interest Rates   **7 hrs**
Role of money and interest rates in the economy, Function of money, Amount of money in economy and causes of its growth, Concept of money multiplier in the real world, Methods of determining interest rates, Money and interest rates, Role of central banks in the functioning of economies, The impact of change in the money supply and/or interest rates on the level of business activity, Role, structure and stability of the financial system, Evaluation of different financial systems with reference to the UK and China, Financial markets and a nation's objectives, Different participants in the financial markets, Development of financial systems, Factors affecting the stability of financial systems.

Unit 6 Business Activity, Unemployment and Inflation   **4 hrs**
Level of business activity and its impact on unemployment and inflation, Equilibrium level of income in a simple Keynesian model, Concept of multiplier and calculation of its value, Effect of a rise in money supply on output and prices, Unemployment and inflation, Business and consumer expectations, Policy of targeting inflation, Course of a business cycle and its turning points.

Unit 7 Demand-Side and Supply-Side Macroeconomic Policies   **9 hrs**
*Demand-side Policy***:** Macroeconomic policy and its types , Fiscal policy and economic fluctuations, Fiscal rules, Monetary policy in the UK and the Euro zone, Roles of the Bank of England and European Central Bank, Targeting inflation, Interest rates and economic activity, Merits of following a simple inflation target as a rule for determining interest rates, alternative rule to the inflation target.
*Supply-side Policy***: S**upply-side policy and its impact on businesses and economy, Types of supply side policies that can be pursued and discuss their effectiveness, Impact on business of a policy of tax cuts, Major types of policy open to governments to encourage increased competition.

Text Book:
J., Hinde, K., and Garratta, D. Sloman, Economics for Business, Fifth edition (2010), Prentice Hall,

References
1. Begg, D. K. H.; Fischer, S.; Dombusch, R., Economics, eighth edition (2005), Mc Graw-Hill.
2. Lipsey, R. G.; Chrystal, K. A., Economics, 11th edition (2007), Oxford University Press.
3. Mankiw, N.G.; Taylor, M P. Thomson, Economics, 2006.
4. Parian, M, Powell, M.; Matthews, K., Economics, 7th edition (2007), Pearson Education.
5. Sloman, J., Essentials of economics, 4th edition (2006), FT Prentice Hall.

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SCHOOL OF MATHEMATICAL SCIENCES
Bachelor in Mathematical Sciences (B.Math.Sc.)

Course of Study

Code No.: MSEN 401   Full Mark: 75
Paper: **Technical Writing and Communication English**   Pass Mark: 30
Nature: Theory   Credit: 3

Course Description:

As a pre-professional, learning how to develop appropriate, timely, and persuasive documentation prepares you for the fast-paced demands of an employer, colleagues, and clients. Although any style of writing takes a lifetime to develop, learning the key elements of professional documentation will enhance and shape how people make critical decisions or make changes in habits. This course will expose you to the professional and technical situations you may encounter in a workplace setting and prepare you to perform audience analyses, usability testing, persuasive communication, tailored documentation, and most importantly how to write with clarity, concision, style, and appropriate tone.

Learning Objectives:

After successfully completion of this course the students will be able to:

1. Familiarize themselves with the plain English approach to writing
2. Recall general technical writing characteristics by developing technical documentation
3. Describe the benefits and constraints of an informational document for an intended audience through informal usability testing
4. Demonstrate persuasive communication techniques in technical writing documentation
5. Develop abilities to differentiate genre conventions for specialized and general audiences by tailoring professional documents
6. Design and revise documentation for clarity, concision, style, and tone from peer review feedback

Mode of Delivery:

The course will be taught by lecture (48 hrs), and problem solving and class discussion (24 hrs). The use of spreadsheet software for problem solving will be encouraged.

Contents

Unit1 Plain English   **11 hrs**

Plain English, Style: writing a readable sentence, Organization: getting to the point, Layout: adding visual impact, A model for writing.

Unit 2 Understanding the Technical Communication Environment   **8 hrs**

Introduction to technical communication, Understanding ethical and legal considerations, Writing technical documents.

Unit 3 Planning the Document   **8 hrs**

Analyzing audience and purpose, Writing informational reports, Organizing information.

Unit 4 Developing and Testing the Verbal and Visual Information   **12 hrs**

Communicating persuasively, Emphasizing important information , Creating graphics, Designing print and online documents.

Unit 5 Learning Important Applications   **9 hrs**

Writing job application materials, Writing definitions, descriptions and instructions.

Textbooks
1. Edward P. Bailey, Jr., *The Plain English Approach to Business Writing*, Oxford University Press, New York, 1997
2. Mike Markel, Stuart A. Selber, *Technical Communication*, 12th edition, Bedford/St. Martin's, Boston, 2017

References
1. Mike Markel, *Practical Strategies for Technical Communication*, Bedford/St. Martin's, Boston, 2016.
2. Meenakshi Raman, Sangeeta Sharma, *Technical Communication Principles and Practice*, Oxford University Press, India, 2015.
3. Martin Cutts, *Oxford Guide to Plain English* , Oxford University Press, UK, 2013.
4. Sharon J. Gerson, Steven M. Gerson , *Technical Communication Process and Product*, Prentice Hall, 2012.
5. Kathy Gemmell, *The Write Stuff* , Emphasis, UK, 2015.

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TRIBHUVAN UNIVERSITY
INSTITUTE OF SCIENCE AND TECHNOLOGY
SCHOOL OF MATHEMATICAL SCIENCES
Bachelor in Mathematical Sciences (B.Math.Sc.)

Course of Study

Code No.: MSHU 401   Full Marks: 75
Paper: **Anthropology**   Pass Marks: 30
Nature: Theory   Credit: 3

Course Description:

This course is a general introduction of anthropology of Nepal. It offers an outline of history of anthropology and introduces issues in Nepali society and cultural diversity through reading of selected anthropological works.

Learning Objectives:

The main objective of this course is to make the students familiar with the discipline of anthropology, its scope and nature. Also, familiarize the students on contemporary issues in Nepal, and analyze the issues from anthropological perspectives.

Mode of Delivery:

The course will be taught by lecture (48 hrs), and problem solving and class discussion (24 hrs). The use of spreadsheet software for problem solving will be encouraged.

Contents:

Unit 1 Basic Concepts in Anthropology   10hrs

Definition, scope and nature of anthropology, History of anthropology, Four fields of anthropology(Physical, Archaeological, Linguistic and Ethnology anthropology, Anthropology and other social sciences) **,** Culture, norms, values, belief, community, discourse, emic and etic, ethnography, enculturation/socialization, gender, myth, person, society, social structure, and ritual.

Unit 2 Anthropology of Nepal and Cultural Diversity   10hrs

History, Key issues in development and future of anthropology in Nepal, Nature of cultural diversity, Approaches to diversity, Challenges of respecting diversity, Culture of politics and politics of culture: Interconnectedness of culture and politics, Issues in cultural politics in Nepal, Changes in the political culture.

Unit 3 Violence and symbolic Violence   7hrs

Diversity of gender relationship, Nature and history of violence in Nepal, Symbolic and structural violence, Ways to non-violence and peace.

Unit 4 Constitution and its Discontents   6hrs

Evolution of constitutionalism in Nepal, Issues of exclusion and inclusion, Causes of failure and problem with new constitution, State and democracy in Nepal.

Unit 5 Nationalism and Patriotism   5hrs

History of nationalism in Nepal, Diversity and discontents with nationalism, Emerging new form of nationalism.

Unit 6 Changing Agriculture and Environment   **5hrs**

Changing nature of subsistence agriculture, Himalayan environmental crisis revisited and new crisis, Future of agriculture and sustainable environment.

Unit 7 Challenges of Education and Health Improvements   **5hrs**

Issues of equal educational outcomes, Issues of equal health outcomes, Inequality and challenges in education and health situation.

References

1. Kottak, C. P. (2011), *Cultural Anthropology: Appreciating Cultural Diversity ,* McGraw Hill.

2. Scupin, R. and De Corse, C. R. (2009), *Anthropology: A Global Perspective*, PHI Learning Pvt. Ltd., New Delhi.

3. Barnard, A. and Spencer, J. (2010), *Encyclopedia of Social and Cultural Anthropology* .

4. Barnard, A. (2000), *History and Theory in Anthropology*, Cambridge University Press, UK.

5. Holmberg, D. (2006), "Violence, non-violence, sacrifice, rebellion, and the state " *Studies in Nepali History and Society* 11(1): 31-64.

6. Lawoti, Mahednra, (2007), Contentious politics in democratizing Nepal, Sage Publications, New Delhi.

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Bachelor in Mathematical Sciences (B.Math.Sc.)

Course of Study

Code No.: MSMN 401   Full Marks: 75

Paper: **Risk Management and Insurance**   Pass Marks: 30

Nature: Theory   Credit: 3

Course Description:

The course covers introduction to risk and insurance, Contractual Provisions and Legal Doctrines, Rate Making, Marketing, Underwriting and Claims, Financial Management of Insurance Companies.

Learning Objectives:

The objective of this course is to familiarize students with the concept and application of insurance and risk management. This course also aims to orient the student about insurance business mechanisms and practices in Nepal.

Mode of Delivery:

The course will be taught by lecture (48 hrs), and problem solving and class discussion (24 hrs). The use of spreadsheet software for problem solving will be encouraged.

*Contents***:**

Unit 1 Introduction to Risk   **10 hrs**

Concept and Types of Risk, Risk and Hazards, Meaning and objective of Risk Management, Risk Management Functions, Risk Management Techniques: avoidance, loss prevention and control, loss retention and insurance, Risk Management Matrix, Risk Management Process, Loss Minimization Techniques, Firm Value Maximization and Cost of Risk; Individual Risk Management and Cost of Risk; Risk Management and Societal Welfare, Risk Management Practices in Nepal.

Unit 2 Risk Identification and Pooling Arrangements   **5 hrs**

Evaluating Frequency and Severity of Losses, Risk Reduction through Pooling, Independent Losses; Pooling Arrangements with Correlated Losses; Insurers as Managers of Risk Pooling Arrangements.

Unit 3 Insurability of Risk, Contractual Provisions and Legal Doctrines   **4 hrs**

Factors that Limit the Insurability of Risk; Contractual Provisions that Limit Coverage

Unit 4 Fundamentals Principles of Insurance   **5 hrs**

Principles of indemnity, Principles of insurable interest, Principles of subrogation

Principles of utmost good faith, Principles of proximate cause, Principles of risk mitigation, Principles of contribution.

Unit 5 Rate Making   **4 hrs**

Approaches of insurance pricing, objectives of rate making, rate making in property and liability insurance, rate making in life insurance

Unit 6 Marketing   **4 hrs**

Objectives of marketing, Life insurance marketing, property and liability insurance marketing, types of marketing

Unit 7 Underwriting and Claims   **4 hrs**

Concept of Underwriting, Types of Underwriter, Responsibility of Underwriter, Basic Underwriting Principles, Life Insurance Underwriting, Non-Life Insurance Underwriting, Concept of Claim Management, Meaning of Claim Settlement, Process of Claim Settlement, Legal Provision on Claims Settlement in Nepal, Life Insurance Claim Settlement Procedure, Non-Life Insurance Claim Settlement Procedure

Unit 8 Management of Insurance Companies   **5 hrs**

Concept of insurance management, types of insurance company, departmentalization and responsibility of departments, risk management in insurance company, managing human resources, managing

Unit 9 Financial Management of Insurance Companies   **7 hrs**

Guidelines for preparation of Financial Statements, Structure of Financial Statements of Insurer, Revenue Accounts, Profit and Loss Accounts, Balance Sheet, Cash Flow Statements, Changes in Equity, Notes to Accounts, Accounting Policy, ALM in life and property and casualty insurance, management of insurance fund, investments directives.

References

1. Emmett, J. Vaughan and Therese, M. Vaughan, **Fundamentals of Risk Management**
2. Harrington, S. E., and Niehaus, G. R., *Risk Management and Insurance,* Tata McGraw-hill, New Delhi.
3. Rejda, G. E., *Risk Management and Insurance,* Pearson Education, New Delhi.
4. Dorfman, M. S., *Introduction to Risk Management and Insurance,* Pearson Education, New Delhi.
5. Ghimire, R., *Insurance: Theory and Practices, Buddha Publication,* Kathmandu.

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Course of Study

Code No.: MSMN 401　　　　　　　　　　　　　　　　　Full Mark: 75
Paper:　**Business Management I**　　　　　　　　　　Pass Mark: 30
Nature: Theory　　　　　　　　　　　　　　　　　　　　Credit:　3

Course Description:

The course covers External Business Environment, Organisational Development and Culture, Organisational Behaviour, Globalisation and Internal Environment and Managing Change.

Learning Objectives:

On successful completion of this subject, a student will be able to:

1. Analyse the key drivers of external and internal business environments.
2. Apply the strategic tools and frameworks needed to assess the competitiveness of a business.
3. Understand how to manage change within an organisation.

Mode of Delivery:

The course will be taught by lecture (48 hrs), and problem solving and class discussion (24 hrs). The use of spreadsheet software for problem solving will be encouraged.

Contents:

Unit 1 External Business Environment　　　　　　　　　　　　　　　10 hrs

Competitive environment and its types, Impact and influence of the external environment on an organisation and its strategy, Key drivers of external demands for corporate social responsibility and the way in which organisations can respond,

Unit 2 Organisational Development and Culture　　　　　　　　　　9 hrs

Meaning and nature of organisational development, Nature, types and main features of organisational culture, Influences on the development and importance of organisational culture.

Unit 3 Organisational Behaviour (Internal Business)　　　　　　　10 hrs

Nature and main features of organisational behaviour in the context in which different businesses operate, Changing nature of work and work organization, Comparison of the main features of different approaches to organisation and management, Importance of management as an integrating activity.

Unit 4　Globalisation and Internal Environment　　　　　　　　　9 hrs

Assessment of the impact of globalisation, International context and cultural influences, Impact and influence of the internal environment on the implementation of an organisation's strategy.

Unit 5. Managing Change   **10 hrs**

Nature of organizational change and the reasons for resistance to change (external and internal change triggers), Management of change and the human and social factors of change, Tools and methods for successfully implementing a change programme, Risks associated with managing change.

References

1. David Campbell and Tom Craig, *Business Environment* , Elsevier, 2005.
2. Gary Neil McLean , *Organization Development*, Berrett-Koehler Publishers, Inc., California, 2006.
3. Ian Brooks, *Organisational Behaviour*, Pearson Education Limited , 2006
4. Nancy Langton and et al,*Organizational behaviour : concepts, controversies, applications*, Pearson, canada, 2016.
5. Phil Kelly and Andrew Ashwin, *The Business Environment*, Cengage Learning, 2013
6. V.G. Kodalkar, *Organizational behaviour* , New Age International (P) Ltd., Publishers, 2007.
7. Thomas G. Cummings & Christopher G. Worley*, Organization Development & Change*, South-Western, a part of Cengage Learning 2009.
8. Mullins, Laurie J., *Management and organisational behaviour*, Pearson, New York, 2016.
9. Duncan Kitchin, *An Introduction to Organisational Behaviour for Managers and Engineers*, Elsevier Ltd., 2010.

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SCHOOL OF MATHEMATICAL SCIENCES
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Course of Study

Code No.: MSMT 401   *Full Mark:* 75

Paper: **Project**   *Pass Mark:* 30

Nature : Practical   *Credit:* 3

Course Description:

The dissertation allows students to consolidate and extend the knowledge and skills acquired during the coursework and apply these in a practical way. There will be faculty supervisors helping the students in doing the project work and to write a dissertation on the same.

Learning Objectives

This course provides the students an opportunity to work on a specific area in Actuarial Science in which they are interested in by taking up a specific problem of interest and submit a detailed report on the same after a scientific investigation of the problem. By the end of the course the students will be able to

1. Carry out scientific research on any area in Actuarial Science
2. Design and carry out research and analyze data using any software package
3. Write a detailed report of the scientific research carried out.

Evaluation Plan

Assessment Marks	Assigned
Written report of the research undertaken	50
Presentation of findings on the research work	25
TOTAL	**75**

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