

**FARWESTERN UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**MASTER OF SCIENCE DEGREE IN CONSTRUCTION PROJECT MANAGEMENT**

Course Title: **Environmental Impact Assessment (Elective)**

Course Code: CPM 626

Year/Semester: I/II

Class Load: 4 hours per week (Theory: 4 Hrs.)

Credits: 4 (60 Hrs)

Evaluation:

	Theory	Practical	Total
Internal	40	-	40
Final (External)	60	-	60
Total	100	-	100

**Course Descriptions and Objective:**

The objective of the course is to provide the student a basic concept of Environment Impact Assessment (EIA). Environmental Impact Assessment (EIA) is an important tool for public and private development and for planning decisions towards creating a sustainable society. In this course, students learn EIA theories, methods, regulations and its historical process with several case studies. Scientific aspects such as predictions and evaluation methods as well as democratic aspects relating to public participation will be explained. The course also explores “strategic environmental assessment”. The focus is not only limited to lectures by the faculty members, but also includes presentations by students.

**Course Contents:**

**UNIT1: Need and Concept of Environmental Impact Assessment [12 hours]**

- 1.1 Introduction to Environmental Impact Assessment (EIA)
- 1.2 Emergence of EIA, understanding of Earth systems, the natural and the social sciences
- 1.3 History of development EIA in Nepal
- 1.4 Benefit of EIA, Types of EIA, EIA principles, purpose and role of EIA in the decision-making process, EIA trends and practices in an international perspective,
- 1.5 Concepts of environmental system,
- 1.6 Environmental and Social Consideration
- 1.7 Sustainable Development Goal and natural resources
- 1.8 Impact Of Development Projects ,Project Types
- 1.9 Need For Environmental Impact Assessment (EIA)
- 1.10 Environmental Impact Statement (EIS)
- 1.11 EIA Capability And Limitations
- 1.12 Stage in EIA process, EIA Process and Project cycle
- 1.13 Types of Environmental impacts
- 1.14 Strategic environmental assessment [SEA]
- 1.15 Social impact assessment (SIA),
- 1.16 Legal Aspects of Environmental Impact Assessment
- 1.17 Environmental legislative and policies in Nepal

**UNIT 2: Methodology [10 hours]**

- 2.1 Methods Of EIA, Check Lists , Matrices, Networks,
- 2.2 Cost-Benefit Analysis
- 2.3 Analysis Of Alternatives
- 2.4 Screening and Initial Environmental Examination (IEE)
- 2.5 Objectives of Screening and IEE
- 2.6 Screening procedure
- 2.7 Initial Environmental Examination procedure
- 2.8 Scoping ,Objectives of Scoping, Scoping Process
- 2.9 Terms of Reference and its main components

**UNIT 3: Establishing the Environmental baseline [6 hours]**

- 3.1 The Environmental setting
- 3.2 Purpose of baseline data
- 3.3 Methods of data collection
- 3.4 Importance of baseline data

**UNIT 4: Impact Identification, Prediction and Evaluation Techniques [10 hours]**

- 4.1 Methods of impact identification
- 4.2 Methods of impact prediction (Physical, Chemical, Biological impacts, Socio-Economic impacts, Techniques for analysis and predication of impacts (water, air, noise, land, ecosystem, Flora & Fauna)
- 4.3 Impact evaluation techniques, Impact aggregation, Mitigation measure,
- 4.4 Mathematical Models, Numerical on impact prediction and evaluation (water , air , noise , Land , etc )

**UNIT 5: Environmental Protection Measures (EPMs) [4 hours]**

- 5.1 Introduction
- 5.2 Types of mitigation measures
- 5.3 Criteria of appropriate mitigation
- 5.4 Implementation of EPMs

**UNIT 6: Management of EIA process [8 hours]**

- 6.1 Environmental Management Plan (EMP)
- 6.2 Environmental Monitoring
- 6.3 Environmental Auditing
- 6.4 EIA Report Review and Decision Making
- 6.5 Stakeholders, Stakeholder Consultation
- 6.6 Public Participation

**UNIT 7: Report Preparation and case Studies (10Hrs.)**

- 7.1 Preparation of Baseline Report, Preparation of TOR, Preparation of Scoping Document  
Preparation of Environmental Management Plan (EMP), Preparation of IEE Report,  
Preparation of EIA Report
- 7.2 EIA for Infrastructure Projects – Dams and Tunnels (Hydropower )– Highways ,  
Railways, Rope way Cable Cars – Transmission Lines, Fuel Transmission Pipelines  
Multi-Storey Buildings, Cable Cars, Water Supply and Drainage Projects – Waste  
Water Treatment Plants, Landfill Site, Mining's, Brick Factory , Manufacturer and  
Processing Industries Etc

## **PLAGIARISM**

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### **Indicative References:**

1. Upreti, B. K.: Environmental Impact Assessment: process and practice. Published by Uttara Uprety, Koteswor, Kathmandu, 2003
2. IUCN/Nepal: EIA Training Manual for Professionals and Managers. Published by IUCN/Nepal, 2003
3. International treaty , commitment , declaration, etc related to Environment
4. Canter, Larry W., Environmental Impact Assessment, McGraw Hill, 1996
5. Act, rules, guidelines of govt. of Nepal on EIA
6. Estrella, M and N. Saalismaa. 2011. Demonstrating the Role of Ecosystems-based Management for Disaster Risk Reduction. ed., UNISDR GAR Report, 48pp. Geneva: Partnership for Environment and Disaster Risk Reduction
7. Estrella, M. and N. Saalismaa (2010) Estrella, M and N Saalismaa (2010). Demonstrating the Role of Ecosystem-based Management for Disaster Risk Reduction. A Policy Paper Presented to the UNISDR Global Assessment team in preparation for the 2011 GAR, 48 pp.
8. Gupta, Anil K. and Nair, Sreeja S. (2012). Ecosystem Approach to Disaster Risk Reduction, National Institute of Disaster Management, New Delhi,
9. Sudmeier-Rieux Dr. Karen et al“Disasters, Environment &Risk Reduction (Eco-DRR)” Instructor’s Manual • Version 2013© CNRD & PEDRR,

**FARWESTERN UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**MASTER OF SCIENCE DEGREE IN CONSTRUCTION PROJECT MANAGEMENT**

Course Title: **Materials and Inventory Management (Elective)**

Course Code: CPM 625

Year/Semester: I/II

Class Load: 4 Hrs. per Week (Theory: 4 Hrs.)

Credits: 4 (60 Hrs)

Evaluation:

	Theory	Practical	Total
Internal	40	-	40
Final (External)	60	-	60
Total	100	-	100

**Course Descriptions and Objective:**

The objective of this course is to provide students understanding of the role and functions of materials and inventory management and make them able in planning and managing materials and inventory of any institutions and construction and introductions.

**Course Contents:**

**UNIT 1: Introduction (8Hrs.)**

- 1.1 Importance and scope of material and inventory control
- 1.2 Classification of stores – Stock, Road metal, Tools and plants and materials charged direct to works
- 1.3 Classification of government property

**UNIT 2: Policy (12 Hrs.)**

- 2.1 Materials planning and budgeting
- 2.2 ABC Analysis
- 2.3 Codification and standardization
- 2.4 Source selection

**UNIT 3: Stores Management (14 Hrs.)**

- 3.1 Store systems and procedures
- 3.2 Incoming materials control
- 3.3 Stores accounting and stock verification
- 3.4 Materials handling
- 3.5 Transportation and traffic management

**UNIT 4: Inventory Management (14 Hrs.)**

- 4.1 Understanding of inventory management in Nepal
- 4.2 Economic Order Quantity (EOQ)
- 4.3 Just in Time (JIT)
- 4.4 Use of computers in inventory management

## **UNIT 5: Research (12 Hrs.)**

Students have to take individual study to understand the factors affecting the materials management functions to ensure their decision making capability related to important items - major construction materials, tools and equipment. The students require selecting a case, organization, project or problems related to materials and inventory, conduct a systematic study and submit a report (30 pages).

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### **Indicative References:**

- 1.0 Gopal Krishnan and M. Sundaresan, Materials Management, Prentice-Hall of India
- 2.0 B. L. Gupta and Amit Gupta, Construction Management and Machinery, Standard Publishers Distributors, Delhi, India
- 3.0 Chapman Arnold, Introduction to Materials Management, Pearson
- 4.0 A. K. Dutta, Materials Management: Procedures, Text and Cases, Prentice Hall of India Private Limited
- 5.0 Richard J Tersine, Principles and Inventory and Materials Management, Prentice Hall
- 6.0 Relevant laws and policies
- 7.0 महालेखा नियन्त्रक कार्यालय, नेपाल सरकारको लेखा निर्देशिका २०७३
- 8.0 International Journal of Purchasing and Materials Management, Wiley Online Library
- 9.0 International Journal of Physical Distribution & Logistics Management, Emerald
- 10.0 Journal of Purchasing & Materials Management, Institute for Supply Management (ISM), India
- 11.0 Materials Management Review (MMR), Indian Institute of Materials Management

**FARWESTERN UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**MASTER OF SCIENCE DEGREE IN CONSTRUCTION PROJECT MANAGEMENT**

Course Title: **Occupational Health and Safety in Construction (Elective)**

Course Code: CPM 624

Year/Semester: I/II

Class Load: 4 hours per week (Theory: 4 Hrs.)

Credits: 4 (60 Hrs)

Evaluation:

	Theory	Practical	Total
Internal	40	-	40
Final (External)	60	-	60
Total	100	-	100

**Course Descriptions and Objective:**

After completing this course, students will be able to identify problems and issues related to safety at construction site. Students will be able to independently manage safety at construction site.

**Course Contents:**

**UNIT 1: Introduction (4 hrs)**

Construction industry and safety; Meaning and scope of construction safety; Concept of Risk and Hazard, Various aspects of construction safety; Scope for improvement.

**UNIT 2: Modern Safety Concept (6 hrs)**

Introduction; The British Safety Legislation; Growth of safety laws and legislation; Legislation, penalties or standards; Concern over health and safety of workers; Concern for general people and property; Educating the mass. Nepalese Law related to Construction Safety.

**UNIT 3: Accidents and Their Causes (8 hrs)**

Software causes, Hardware causes; Unsafe work site, Improper tools and equipment, and Improper storage of materials, as hardware causes; Unsafe act, Unsafe behavior, Poor communication, lack of training, low level of education of the workers, and low skill of workers as software causes; Accidents at construction sites; Losses due to accidents. Calculation of lost hour and lost resources.

**UNIT 4: Attending the Emergency (6 hrs)**

Introduction; Fire emergency; Drowning, Electric shock; Burn with Acids and chemicals; Attending a person fallen from height; First aid at construction site. The first aid center.

**UNIT 5: Prevention of Accidents (6 hrs)**

Introduction; Role of legislation; Implementation of safety plan at construction site; Awareness and self-discipline; Design provisions for reducing accidents; Eliminating the accidents at construction sites.

**UNIT 6: Documentation for Safety Management (8 hrs)**

Preparation of an EHS plan; Fire safety plan; Emergency dealing plan; Site security plan; Machine inspection records; Daily observation records; Meeting minutes; Test certificates, Manufacturer's instruction manual for storage and handling of hazardous substances; Site activity records.

**UNIT 7: Work Place Safety Management (12 hrs)**

Organization safety policy – its content; Review of contractor's safety policy; Approval of contractor's EHS plan; Safety signal and signage; Awareness generating slogans; Equipment safety – third party inspection, licensed operator, training of operator; Ensuring electrical safety – installing correct circuit breakers, training of electrician; Housekeeping; Training of workers – Induction, tool box talk, skill training, periodical safety briefing; Safety walk down at site; Safety meetings; Safety reporting; Method statement and job safety analysis (JSA); Near miss reporting; Accidents reporting; Report of property loss; Safety performance chart. Safety supervision – qualification and competence of safety supervisor, role of safety engineers and safety stewards, daily safety inspection and reporting. Safety committee–role of safety committee, committee participants. Commitment of Top Management.

**UNIT 8. Motivating for Safety (6 hrs)**

Introduction; Motivating the workers; Training as motivator, Motivating the construction supervisors and managers; Motivating the planners and designers; Motivating the contractors; Motivating the General public. The safety committee.

**UNIT 9. Cost of Accident (4 hrs)**

Introduction; Cost to the contractor; Cost to the employer; Cost to the society, Cost of managing safety at construction site; Provision in the tender document.

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**Indicative References:**

1. *Safety Management in the Construction Industry*, A NICMAR publication, 1998
2. *Safety Management*, John V. Grimaldi and Rollin H. Simonds, Richard D. Irwin, Inc., 1989
3. *Construction Technology*, S. S. Atev, Mir Publishers, Moscow, 1997

**FARWESTERN UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**MASTER OF SCIENCE DEGREE IN CONSTRUCTION PROJECT MANAGEMENT**

Course Title: **Urban Planning and Development (Elective)**

Course Code: CPM 627

Year/Semester: I/II

Class Load: 4 hours per week

Credits: 4 (60 Hrs)

Evaluation:

	Theory	Practical	Total
Internal	40	-	40
Final (External)	60	-	60
Total	100	-	100

**Course Descriptions and Objectives:**

This course aims to familiarize the students about various concepts of urban and settlement planning; introduces the planning process and plan preparation techniques; enable students to explore key planning issues, challenges and opportunities in context of developing countries, formulate plans for settlements, and update and revise the existing/proposed land use plan. It also highlights on the importance of sustainable approach to urban planning and development.

**Course Contents:**

**UNIT 1: INTRODUCTION (8 Hrs)**

- 1.1 Concept of Planning: Origin and evolution, Concept of Urban and settlement Planning, Planning objectives, Benefits of planning
- 1.2 Elements of human settlements, the growth and decay of human settlements.
- 1.3 Planning as interdisciplinary subject
- 1.4 Settlement types: ancient, medieval, renaissance and industrial age; historical and traditional settlements in Nepal; urban and rural characters of settlement; Squatter Settlements - relevant examples from Nepal.

**UNIT 2: URBAN/CITY PLANNING (18Hrs)**

**2.1 Planning Concepts (6Hrs)**

- 2.1.1 Morphology of the city; Social/economical/political and technological processes in the growth of cities
- 2.1.2 Introduction to theoretical models of planning; contributions of Ebenezer Howard, Patrick Geddes, Tony Garnier, CA Perry, Lewis Mumford, Le-Corbusier and others in planning.

**2.2 Development Plans (6Hrs)**

- 2.2.1 Various types of plans: National Plan, Regional Plan, Master Plan, Structure Plan, Local Development Plan- their general scope, content, planning process and Planning guidelines
- 2.2.2 Land Use Planning: Comprehensive land use plan and its functions
- 2.2.3 Subdivision and zoning byelaws

2.2.4 Steps needed to develop land-use plan

**2.3 Planning Practice in Nepal (6Hrs)**

2.3.1 Historical overview on Nepalese Planning Practice- Rural and Urban Planning

2.3.2 Urbanization and Urban Growth in Nepal

2.3.3 Contemporary planning practice- comprehensive planning, participatory planning- Integrated Approach to Planning

**UNIT 3.0: SUSTAINABLE DEVELOPMENT, SUSTAINABILITY AND SUSTAINABLE CITIES (8 Hrs)**

3.1 Concept of Sustainable Development and Sustainability

3.2 Concept of Sustainable Cities

3.3 Community Participation in Urban Development and Planning

3.4 Nepal's Experience in Sustainable Urban Development: Key Issues and Challenges

**UNIT 4: ESSENTIAL FEATURES OF URBAN PLANNING (6 Hrs)**

4.1 Demography/population studies, population composition, structure, characteristics

4.2 Employment-basic and non-basic form of employment

4.3 Utilities and services: water supply/drainage, sewerage/sanitation, electricity, transportation-types and patterns

**UNIT 5: PROCESS OF URBAN PLANNING AND DEVELOPMENT (8Hrs)**

5.1 Key steps in the process of urban planning: Identify problems and needs; Collect and analyse data; Develop goals & objectives; Clarify and diagnose problems or issues; Identify possible alternatives; Analyze alternatives and assess impacts; Evaluate and recommend alternatives; Making decisions; and Implementation & monitoring.

5.2 Data collection: Survey (Sampling technique, types of surveys), Statistical analysis-mean/mode/median, standard deviation, corrections, regression, variance

5.3 Population Projection, growth rate calculation, demand forecasts, and calculation of Carrying capacity

**UNIT 6: CASE STUDY (12 Hrs)**

Case Study of Urban Planning and Development Projects- Identification of Problems and possible solutions

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### **Indicative References:**

1. The Urban pattern: City planning and design / GALLION, A B.
2. Text book of Town Planning / BANDOPADHYAY, ABIR
3. Town Planning / RANGWALA, R C
4. Introduction to Town Planning / CATANES, A & SNYDER J
5. Design of cities / BACON, EDMUND N
6. Ekistics : An introduction to the science of human settlement / Doxiadis, C. A
7. Garden cities of tomorrow / HOWARD, EBENZER
8. The city in history / MUMFORD, LEWIS
9. The Image of the City / LYNCH, KEVIN