ENGINEERING PROFESSION AND SOCIETY

ENEE 463

Lecture : 3 **Year : IV**
Tutorial : 0 **Part : II**
Practical : 0

Course Objectives:

The objective of this course is to align engineering practice with Nepal's regulatory framework, specifically focusing on the Nepal Engineering Council Act, Public Procurement Act, and relevant labor laws. It aims to integrate sustainability, risk management, and Environmental, Social, and Governance (ESG) principles into engineering leadership.

1 Engineering, Society and Professionalism (5 hours)

1.1 Evolution of the engineering profession and industry expectations in Nepal
1.2 Global Standards: Graduate Attributes and professional competence (GAPC), Washington Accord and other accreditation
1.3 Professional Registration: Nepal Engineering Council (NEC) framework, ordinary and professional engineers and the licensing requirements
1.4 The socio-economic role of an electrical engineer in Nepal's infrastructure and energy development

2 Ethics and Ethical Decision-Making in Modern Engineering (7 hours)

2.1 Engineering ethics frameworks: Utilitarianism, Duty Ethics, and Virtue Ethics
2.2 Moral dilemmas, conflict of interest, and the ethics of whistleblowing
2.3 Structured decision-making tools for complex engineering failures

3 Legal and Regulatory Environment in Nepal (10 hours)

3.1 NEC Act and Regulations: Current amendments and the professional code of conduct
3.2 Public Procurement Act (PPA): Bidding principle, processes and electronic government procurement (e-GP)
3.3 Labor Act and Company Act: Occupational health and safety (OHS), social security, and corporate structures for engineers
3.4 Digital Governance and Cyber Laws: Electronic Transactions Act and cyber security frameworks for critical infrastructure
3.5 Electricity and Energy Regulatory Framework: Provisions of the Electricity Act, generation/transmission licensing, and the role of the Electricity Regulatory Commission (ERC).Electricity Act

3.6 Intellectual Property (IP): Patenting, copyrights, and technology transfer in the engineering sector

4 Contract, Procurement and Project Governance (7 hours)

4.1 Types of contracts: Lump sum, EPC, and Design-Build, and their applications in the energy sector
4.2 FIDIC Basics: General conditions of contract, risk allocation, and the role of the Engineer
4.3 Public-Private Partnership (PPP) frameworks in Nepal's hydropower and infrastructure
4.4 Dispute resolution mechanisms: Negotiation, Mediation, Adjudication, and Arbitration (NEPCA rules)

5 Sustainability, ESG and Climate Governance (6 hours)

5.1 ESG Principles: Integrating Environmental, Social, and Governance criteria into project planning
5.2 Nepal's Environmental Regulations: EPA/EPR and Environmental Impact Assessment (EIA) processes
5.3 Climate resilience, decarburization, and sustainability in power systems
5.4 Social impact and community acceptance: Managing Right of Way (ROW) and land acquisition disputes

6 Risk, Safety and Engineering Liability (5 hours)

6.1 Risk governance and enterprise risk management in engineering projects
6.2 Professional negligence, strict liability, and the duty of care
6.3 Engineering insurance, professional indemnity, and building a safety culture

7 Engineering Leadership and Professional Communication (5 hours)

7.1 Leadership dynamics and governance structures in multidisciplinary technical teams
7.2 Ethics in professional reporting, documentation, and expert witness testimonies
7.3 Stakeholder engagement and strategic communication for project governance

Final Exam

The questions will cover all the chapters in the syllabus. The evaluation scheme will be as indicated in the table below:

Chapter	Hours	Mark distribution*
1	5	8
2	7	14
3	10	6

4	7	6
5	6	12
6	5	8
7	5	6
Total	**45**	**60**

* There may be minor deviation in marks distribution.

References

1. Government of Nepal. (1992). Electricity Act, 2049 and Electricity Bill, 2081. Ministry of Energy, Water Resources and Irrigation.
2. Government of Nepal. (2007). Public Procurement Act, 2063 and Public Procurement Regulations, 2064 (with amendments). Public Procurement Monitoring Office.
3. Government of Nepal. (2017). Labor Act, 2074 and Contribution-based Social Security Act, 2074. Ministry of Labour, Employment and Social Security.
4. Government of Nepal. (2019). Environment Protection Act, 2076 and Environment Protection Rules, 2077. Ministry of Forests and Environment.
5. Harris, C. E., Jr., Pritchard, M. S., Rabins, M. J., James, R., & Englehardt, E. (2018). Engineering ethics: Concepts and cases (Latest ed.). Cengage Learning.
6. International Federation of Consulting Engineers. (2017). Conditions of contract for construction (Latest ed.). FIDIC.
7. International Organization for Standardization. (2018). Risk management: Guidelines (ISO Standard No. 31000:2018). ISO.
8. Martin, M. W., & Schinzinger, R. (2016). Ethics in engineering (Latest ed.). McGraw-Hill Education.