

Course Outline

UNIT CODE	EEEQ521
UNIT NAME	Professional Engineering Practice
CLASS	Bachelor of Engineering in Electrical & Electronic Engineering. Year 5.2
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Purpose

The aim of this unit is to enable the learner to:

1. Understand the impact of engineering solutions in a global, economic, environmental, and societal context.
2. Recognize the need for, and an ability to engage in life-long learning.

Learning outcomes

At the end of this unit learner should be able to:

1. Communicate effectively.
2. Identify and formulate engineering problems
3. Understand of professional and ethical responsibility
4. Use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.

Brief Course description

Financial, legal, regulatory, human resource, ethical and business aspects of engineering practice. Office organisation and management. Human resource management. Professional societies. Engineering registration. The role of engineering in development. Ethics and integrity in engineering practice.

Teaching Methodology

- Through Zoom. Moodle
- Lecture room

Modes of course assessment

Coursework for the unit shall be by continuous assessment and shall be defined as comprising assignments and continuous assessment tests and University examination to contribute 30% and 70% respectively for the total marks.

Instructional materials/Equipment

1. Laptop
2. Lecture room

Main Textbooks

1. Stuart G. Walesh (2012), *Engineering Your Future: The Professional Practice of Engineering*, Wiley; 3rd edition, ISBN: 978-0470900444
2. Ulrik Jørgensen, Søsner Brodersen (2016), *Engineering Professionalism: Engineering Practices in Work and Education*, SensePublishers, ISBN : 94-6300-751-2

Other Reference Materials

3. Jon A. Leydens & Juan C. Lucena (2017), *Engineering Justice: Transforming Engineering Education and Practice (IEEE PCS Professional Engineering Communication Series)*, 1st Ed., Wiley-IEEE Press; 1st edition, ISBN: 978-1118757307
4. Paul W. O'Callaghan (2019), *Professional Practice in Engineering and Computing: Preparing for Future Careers*, 1st Ed, CRC Press, ISBN: 9780429202735.
5. John McPhee, Gordon Andrews, Patricia Shaw (2018), *Canadian Professional Engineering and Geoscience Practice and Ethics*, 1st Ed, Nelson College Indigenous, ISBN: 978-0176509903.

No	Topic Covered	Sub-Topic/Activity
1.	Introduction: Engineering and the Engineer	<ul style="list-style-type: none">• Definitions of Engineering.• Leading, Managing, and Producing: Deciding, Directing, and Doing.• The Seven Qualities of Effective Leaders.• The Engineer as a Builder.
2.	Leading and Managing: Getting Your Personal House in Order	Discussion on: <ul style="list-style-type: none">• Time Management• Employment or Graduate School?• The New Work Environment: Culture Shock?• Managing Personal Professional Assets: Building Individual Equity

3.	Design: To Engineer Is to Create	<p>Discussion on:</p> <ul style="list-style-type: none"> • The Root of Engineering • Design in the Context of Major Engineering Functions. • The Disproportionate Impact of the Design Function • Design in Terms of Deliverables • Design as Risky Business • Design as a Personally-Satisfying and People-Serving Process.
4.	Basic Accounting: Tracking the Past and Planning the Future	<p>Discussion on:</p> <ul style="list-style-type: none"> • Relevance of Accounting to the Engineer • The Balance Sheet: How Much Is It Worth? • The Income Statement: Inflow and Outflow • Relationship between the Balance Sheet and the Income Statement. • Accounting for Your Future • The Impact of Time Utilization Rate and Expense Ratio on Profitability in the Consulting Business. • The Income Statement as Part of the Business Plan for a Consulting Firm
5.	Legal Framework	<p>Discussion on:</p> <ul style="list-style-type: none"> • Why Law for Engineers? • Legal Terminology • Liability: Incurring It. Sources of Professional Liability. • Liability: Failures and Learning from Them • Liability: Minimizing It • Maintaining Perspective on Liability Minimization • Legal Forms of Business Ownership and registration (in Kenya, via ecitizen, www.ecitizen.go.ke)
6.	Ethics: Dealing with Dilemmas	<p>Discussion on:</p> <ul style="list-style-type: none"> • Inevitable Ethical Dilemmas and Decisions • Defining Ethics • Four Important Ethical Theories • Legal and Ethical Domain. • Common Ethical Issues and Dilemmas • Codes of Ethics

		<ul style="list-style-type: none"> • Dealing with Ethical Dilemmas: Using Codes and Other Resources. • Codes of Ethics as Guides to Conduct • Case Studies <p>CAT 1 Administration</p>
7.	Role and Selection of Consultant	<p>Discussion on:</p> <ul style="list-style-type: none"> • Consultant Defined and Why You Should Care • Why Retain a Consultant? Let's Do It Ourselves! • Characteristics of Successful Consultants • Consultant Selection Process • Price-Based Selection: Three Costs to the Consultant
8.	Regulation of Engineering	<p>Discussion on:</p> <ul style="list-style-type: none"> • Regulatory Acts: Engineers Act • Licensing Organizations. • Licensing of Engineers: Procedure, requirements and registration process. • Professional societies and their roles. • Benefits of Professional societies
9.	Maintaining Your Professional Competence	<p>Discussion on:</p> <ul style="list-style-type: none"> • Your Career Path: Success or Obsolescence? • Professional Development Activities. • Taking Charge of Your Future
10.	Quality: What Is It and How Do We Achieve It?	<p>Discussion on:</p> <ul style="list-style-type: none"> • Quality Defined • Quality Control and Quality Assurance • Tools and Techniques for Stimulating Creative and Innovative Thinking
11.	Building: Constructing and Manufacturing	<p>Discussion on:</p> <ul style="list-style-type: none"> • The Engineer as Builder: Constructing and Manufacturing • Differences between Constructing and Manufacturing
12.	Marketing: A Mutually-Beneficial Process	<p>Discussion on:</p> <ul style="list-style-type: none"> • Marketing and Selling: Different but Related • A Simple, Powerful Marketing Model • Marketing Techniques and Tools

		<ul style="list-style-type: none">• What Works and What Doesn't Work CAT 2 Administration
13.	Revision	Revision for the end of semester exams
14.	End of semester exams	Administration of end of semester examination