ENG 502.2: Engineering Law (Professional Practice and Procedures)

Course content

Topics
Introduction/ Review of Preliminary Concepts
Registration of Engineers, Duties, Code of Conduct and Practice. Ethics, Professional responsibilities and practice of Engineering in Nigeria
Engineering Projects, Planning and Feasibility studies and their relevance, guide-predesign survey and stages of Engineering design project scheduling. Typical Problems and solutions in Civil Engineering.
Law: Sources and branches of Nigerian Law, Court and tribunals. Law of contracts, the engineer as an expert witness. Typical Problems and solutions in Mechanical Engineering.
Industrial legislation concerned with; incapacity or injury, working conditions, wages, redundancy, trade unions, structure, right and liabilities. Industrial dispute, safety and environmental protection. Typical Problems and solutions in Marine Engineering.

Course Lecturers

Lecturer
Engr. Ogbodo C.M
Engr. Akosubo S.
Engr. Elijah
Engr. Onijite

Lecture Topics: Course Introduction, Registration of Engineers, Duties, Code of Conduct and Practice. Ethics, Professional responsibilities and practice of Engineering in Nigeria

Presented by: Engr. Ogbodo C.M

1.0 Introduction/ Review of Preliminary Concepts

1.0.1 Definition

According to online dictionary, Engineering is branch of science and technology concerned with the design, building, and use of engines, machines, and structures. It is also the action of working artfully to bring something about.

The term engineering is derived from the Latin ingenium, meaning "cleverness" and ingeniare, meaning "to contrive, devise"

The American Engineers' Council for Professional Development has defined "engineering" as:

The creative application of scientific principles to design or develop structures, machines, apparatus, or manufacturing processes, or works utilizing them singly or in combination; or to construct or operate the same with full cognizance of their design; or to forecast their behavior under specific operating conditions; all as respects an intended function, economics of operation and safety to life and property

1.0.2 Brief History

Discovery of Fire 6000 BC - 3000 BC	
Copper Age 5000 BC - 3000 BC	Wheel and Axle, Plow Use of Stone Tools Written Communication Use of soft metal for tools
Babylonian Engineers 3000 BC - 600 BC	Familiar with basic math Could figure out areas and volume of excavations, Number system was base 60 Primitive Arches used in moving water Bridges were built with stone piers carrying wooden stringers Built roads, Gardens of Bablyon
Egyptian Engineers 2900 BC - 1900 BC	Pyramid Age Able to precisely calculate the size of stones
Roman Engineering 600 BC - 400 AD	Aqueducts for: Water supply & Sanitary systems
Middle Ages 0 AD - 1500 AD	First printing press Leonardo da Vinci - Architect, engineer, artist Military and civil engineering feats for war - bridges, catapaults
Industrial Age 1600 - 1700	James Watt built the steam engine Spinning and weaving machinery was developed Luigi Galvani principles of electrical conduction
Revival of Science 1700 - 1800	Hooke discovers the elastic limit Huygens discovers the spiral watch spring, pendulum clock Newton developed Laws of Motion, calculus
Modern Science Begins 1800 - 1899	Electricity develops Generating electricity Transmission of electrical signals Refining iron
20th Century Technology 1900 - 1999	Henry Ford build cars Edison develops the electrical equipment Wright brothers Nylon and plastics were developed First computer Using silicon to create transistors Jet engines Laser technologies were developed Satellite Communications

2.0 Engineering in Nigeria

2.0.1 History Of COREN

The Council for the Regulation of Engineering in Nigeria, COREN, was established by decree 55 of 1970 and amended by Decree 27 of 1992, now the "Engineers (Registration, etc) Act, CAP E11 of 2004" Law of the Federal Republic of Nigeria. The Act establishes COREN as a statutory body of the Federal Government empowered to regulate the Practice of Engineering in all aspects and ramifications in Nigeria.

2.0.2 Mandate Of COREN

The Council for the Regulation of Engineering in Nigeria, COREN, is a body set-up by the Decrees 55/70 and 27/92 (now Acts 110). The Decrees empowered the Council to **regulate and control** the training and practice of engineering in Nigeria and to ensure and **enforce the registration** of all **engineering personnel** *(i.e. Engineers, Engineering Technologists, Engineering Technicians, and Engineering Craftsmen)* and **consulting firms** wishing to practice or engage in the practice of engineering.

3.0 Registration of Engineers in Nigeria

In Section 1 (i) subsections (a) and (b) and subsection (3) of Section (4) of COREN enabling decree, Council is empowered to determine who are engineering personnel and to register them in their respective registers.

Council has been able to regulate, as contained in its publication CP3, that a person desiring to become a registered Engineering Personnel must**;**

a. **after obtaining the approved/accredited required academic qualification, must have four (4) years post-graduate experience which must be under the supervision of a senior registered Engineer.**
b. **Holders of BSc Science + M.Eng. 15 years Post Graduation be considered for registration in Engineers Cadre.**

Council believes that the continuing effectiveness of an engineering personnel depends on his contact with a recognized professional society and therefore **advises** engineering personnel to belong to a recognized professional society.

It must be emphasized that membership of a society does not by itself grant automatic right to registration. Council still needs to satisfy itself that the academic qualification is registrable for the category applied for.

The decree specifies the abbreviation to be used by each cadre as follows:

1. A Registered Engineer shall use the abbreviation "**Engr**" before his name.
2. A Registered Engineering Technologists shall use the abbreviation "**Engn.Tech**" after his name.
3. A Registered Engineering Technician shall use the abbreviation "**Tech**" after his name.
4. A Registered Engineering Craftsman shall use his full title "**Craftsman**" with his trade in bracket under his name.

For procedure and further information on registration by COREN use the link below.

Council for the Regulation of Engineering in Nigeria - HOME (coren.gov.ng)

4.0 Duties of Engineers

Engineers have many different roles in our ever-changing society. Most of the roles can be accommodated in three major categories;

a. Creating New Solutions/Technology
b. Product Development
c. Social Responsibilities

5.0 Code of Conduct and Practice

Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public

health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of social and professional ethical conduct.

5.01 Rules of Practice

1. Engineers shall hold paramount the safety, health, and welfare of the public.
    a. If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate.
    b. Engineers shall approve only those engineering documents that are in conformity with applicable standards.
    c. Engineers shall not reveal facts, data, or information without the prior consent of the client or employer except as authorized or required by law or this Code.
    d. Engineers shall not permit the use of their name or associate in business ventures with any person or firm that they believe is engaged in fraudulent or dishonest enterprise.
    e. Engineers shall not aid or abet the unlawful practice of engineering by a person or firm.
    f. Engineers having knowledge of any alleged violation of this Code shall report thereon to appropriate professional bodies and, when relevant, also to public authorities, and cooperate with the proper authorities in furnishing such information or assistance as may be required.
2. Engineers shall perform services only in the areas of their competence.
    a. Engineers shall undertake assignments only when qualified by education or experience in the specific technical fields involved.
    b. Engineers shall not affix their signatures to any plans or documents dealing with subject matter in which they lack competence, nor to any plan or document not prepared under their direction and control.
    c. Engineers may accept assignments and assume responsibility for coordination of an entire project and sign and seal the engineering documents for the entire project, provided that each technical segment is signed and sealed only by the qualified engineers who prepared the segment.
3. Engineers shall issue public statements only in an objective and truthful manner.
    a. Engineers shall be objective and truthful in professional reports, statements, or testimony. They shall include all relevant and pertinent information in such reports, statements, or testimony, which should bear the date indicating when it was current.

b. Engineers may express publicly technical opinions that are founded upon knowledge of the facts and competence in the subject matter.
c. Engineers shall issue no statements, criticisms, or arguments on technical matters that are inspired or paid for by interested parties, unless they have prefaced their comments by explicitly identifying the interested parties on whose behalf they are speaking, and by revealing the existence of any interest the engineers may have in the matters.

4. Engineers shall act for each employer or client as faithful agents or trustees.
   a. Engineers shall disclose all known or potential conflicts of interest that could influence or appear to influence their judgment or the quality of their services.
   b. Engineers shall not accept compensation, financial or otherwise, from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed and agreed to by all interested parties.
   c. Engineers shall not solicit or accept financial or other valuable consideration, directly or indirectly, from outside agents in connection with the work for which they are responsible.
   d. Engineers in public service as members, advisors, or employees of a governmental or quasi-governmental body or department shall not participate in decisions with respect to services solicited or provided by them or their organizations in private or public engineering practice.
   e. Engineers shall not solicit or accept a contract from a governmental body on which a principal or officer of their organization serves as a member.
5. Engineers shall avoid deceptive acts.
   a. Engineers shall not falsify their qualifications or permit misrepresentation of their or their associates' qualifications. They shall not misrepresent or exaggerate their responsibility in or for the subject matter of prior assignments. Brochures or other presentations incident to the solicitation of employment shall not misrepresent pertinent facts concerning employers, employees, associates, joint venturers, or past accomplishments.
   b. Engineers shall not offer, give, solicit, or receive, either directly or indirectly, any contribution to influence the award of a contract by public authority, or which may be reasonably construed by the public as having the effect or intent of influencing the awarding of a contract. They shall not offer any gift or other valuable consideration in order to secure work. They shall not pay a commission, percentage, or brokerage fee in order to

secure work, except to a bona fide employee or bona fide established commercial or marketing agencies retained by them.

6.0 Professional Obligations and responsibilities

1. Engineers shall be guided in all their relations by the highest standards of honesty and integrity.
    a. Engineers shall acknowledge their errors and shall not distort or alter the facts.
    b. Engineers shall advise their clients or employers when they believe a project will not be successful.
    c. Engineers shall not accept outside employment to the detriment of their regular work or interest. Before accepting any outside engineering employment, they will notify their employers.
    d. Engineers shall not attempt to attract an engineer from another employer by false or misleading pretenses.
    e. Engineers shall not promote their own interest at the expense of the dignity and integrity of the profession.
    f. Engineers shall treat all persons with dignity, respect, fairness and without discrimination.
2. Engineers shall at all times strive to serve the public interest.
    a. Engineers are encouraged to participate in civic affairs; career guidance for youths; and work for the advancement of the safety, health, and well-being of their community.
    b. Engineers shall not complete, sign, or seal plans and/or specifications that are not in conformity with applicable engineering standards. If the client or employer insists on such unprofessional conduct, they shall notify the proper authorities and withdraw from further service on the project.
    c. Engineers are encouraged to extend public knowledge and appreciation of engineering and its achievements.
    d. Engineers are encouraged to adhere to the principles of sustainable development1 in order to protect the environment for future generations.
    e. Engineers shall continue their professional development throughout their careers and should keep current in their specialty fields by engaging in professional practice, participating in continuing education courses, reading in the technical literature, and attending professional meetings and seminars.

3. Engineers shall avoid all conduct or practice that deceives the public.
    a. Engineers shall avoid the use of statements containing a material misrepresentation of fact or omitting a material fact.
    b. Consistent with the foregoing, engineers may advertise for recruitment of personnel.
    c. Consistent with the foregoing, engineers may prepare articles for the lay or technical press, but such articles shall not imply credit to the author for work performed by others.
4. Engineers shall not disclose, without consent, confidential information concerning the business affairs or technical processes of any present or former client or employer, or public body on which they serve.
    a. Engineers shall not, without the consent of all interested parties, promote or arrange for new employment or practice in connection with a specific project for which the engineer has gained particular and specialized knowledge.
    b. Engineers shall not, without the consent of all interested parties, participate in or represent an adversary interest in connection with a specific project or proceeding in which the engineer has gained particular specialized knowledge on behalf of a former client or employer.
5. Engineers shall not be influenced in their professional duties by conflicting interests.
    a. Engineers shall not accept financial or other considerations, including free engineering designs, from material or equipment suppliers for specifying their product.
    b. Engineers shall not accept commissions or allowances, directly or indirectly, from contractors or other parties dealing with clients or employers of the engineer in connection with work for which the engineer is responsible.
6. Engineers shall not attempt to obtain employment or advancement or professional engagements by untruthfully criticizing other engineers, or by other improper or questionable methods.
    a. Engineers shall not request, propose, or accept a commission on a contingent basis under circumstances in which their judgment may be compromised.
    b. Engineers in salaried positions shall accept part-time engineering work only to the extent consistent with policies of the employer and in accordance with ethical considerations.
    c. Engineers shall not, without consent, use equipment, supplies, laboratory, or office facilities of an employer to carry on outside private practice.

7. Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice, or employment of other engineers. Engineers who believe others are guilty of unethical or illegal practice shall present such information to the proper authority for action.
    a. Engineers in private practice shall not review the work of another engineer for the same client, except with the knowledge of such engineer, or unless the connection of such engineer with the work has been terminated.
    b. Engineers in governmental, industrial, or educational employ are entitled to review and evaluate the work of other engineers when so required by their employment duties.
    c. Engineers in sales or industrial employ are entitled to make engineering comparisons of represented products with products of other suppliers.
8. Engineers shall accept personal responsibility for their professional activities, provided, however, that engineers may seek indemnification for services arising out of their practice for other than gross negligence, where the engineer's interests cannot otherwise be protected.
    a. Engineers shall conform with state registration laws in the practice of engineering.
    b. Engineers shall not use association with a non-engineer, a corporation, or partnership as a "cloak" for unethical acts.
9. Engineers shall give credit for engineering work to those to whom credit is due, and will recognize the proprietary interests of others.
    a. Engineers shall, whenever possible, name the person or persons who may be individually responsible for designs, inventions, writings, or other accomplishments.
    b. Engineers using designs supplied by a client recognize that the designs remain the property of the client and may not be duplicated by the engineer for others without express permission.
    c. Engineers, before undertaking work for others in connection with which the engineer may make improvements, plans, designs, inventions, or other records that may justify copyrights or patents, should enter into a positive agreement regarding ownership.
    d. Engineers' designs, data, records, and notes referring exclusively to an employer's work are the employer's property. The employer should indemnify the engineer for use of the information for any purpose other than the original purpose.

7.0 PROBLEMS OF ENGINEERING PRACTICE IN NIGERIA

1. POOR FUNDING FOR RESEARCH AND DEVELOPMENT

   In developed countries of the world, researches are funded by the government and engineers are provided with a conducive environment so they can make researches concerning technological problems in their country. This is not the case in Nigeria. Many Engineers who are innovative enough and come up with technological breakthroughs have no means of receiving special grants to fund the projects. This is how many creative ideas that will solve many problems in Nigerian have seen their untimely death. There have been many cases where young Engineers have succeeded in developing prototypes of machines. However, they have no way of pushing through on such projects due to the lack of funds. The Nigerian government does not prioritise the engineering sector as well as emerging talents. The refusal of the Nigerian government to invest in the engineering sector of the country is one of the major problems of the engineering sector today.

2. INADEQUATE EQUIPMENT

   Most equipment and laboratories in the Nigerian tertiary institutions are outdated and in terrible conditions. This is another problem of the engineering sector today. You will find that the equipment and laboratories used in most tertiary institutions are the old ones bought since the inception of the institutions. These equipment are completely outdated and inadequate for the training of current engineering students in the already technological advanced world. Institutions with laboratories also face the problem of shortage of equipment and other needed Engineering consumables. If Nigerian institutions offering engineering are to be judged wholly on the basis of the availability of equipment, many Engineering graduates in Nigeria will have their certificates rejected.

3. LACK OF HIGH-QUALITY MANPOWER (IN TERMS OF TRAINERS OR TEACHERS)

   Many in the educational system are not current on technological methods. You will find lecturers who do not know how to design the simplest machines. In most Nigerian higher institutions, lecturers only teach theories and insist their students cram these theories in order to pass their examinations. The lack of high-quality manpower in turn affects the quality of engineers in the labour market.

4. LACK OF SKILLED MANPOWER IN THE FIELDS OF ENGINEERING

   You will find that during most recruitment processes, Engineering graduates are not tested on their abilities to create designs or be innovative. Wrong criteria are put in places such as the

writing of essays or theoretical examinations only for recruiting talents. Most of the talented ones in the engineering sector are screened out based on the wrong requirements. It is sad to know that most engineering graduates have never had the experience of handling a tool or equipment throughout their schooling. This in turn affects their skilfulness in the field of engineering. Nigerian engineering students need to be exposed to the use of current technology machines during their engineering program so they can develop the required skills and confidence needed in the field of engineering. Inadequate industrial training of engineering students is the major problem in the practice of Engineering today because it gives rise to other problems such as the employment of foreign labour to the detriment of indigenous engineers.

5. APPROPRIATE GOVERNMENT POLICY TO SUPPORT INDIGENOUS ENGINEERING COMPANIES AND TALENTS

   The budget of the Nigerian government is always tilted towards recurrent expenditure rather than capital assets. Most capital projects and common engineering infrastructure are not funded. What is more, Nigerian contents, contractors and projects are paid little or no attention. The appropriate stakeholders in the engineering sector needs to be put pressure on the government to ensure that engineering sector gets more funds. The government should put the right policies in place to ensure that expatriate companies establish industries and employ Nigerians. This is a way to ensure that indigenous Engineers play more active roles in the infrastructural development of Nigeria.

6. PUBLIC AND PRIVATE SECTOR PARTNERSHIP

   There needs to be a partnership between the private and public sectors. The Nigerian government does not have enough money to facilitate most projects, it is best to allow private companies to put down capital for such projects. When private investment is encouraged, limited government resources can be used for other purposes.

7. EMPLOYING YOUTH AND WOMEN

   Unfortunately, most engineering companies do not like recruiting young graduates' engineers while some do not employ female engineers. This is a discouragement towards women in the engineering sector. The number of slots available for young graduate employment is ridiculously low which means that they are not given the opportunity to learn on the job. Many companies argue they lack resources for the training of such engineering graduates which is why they employ people already skilled and experienced engineers.