

ENGR 201 - Final Exam Study Notes

Lecture 1

- The word "profession" has a religious origin. "To profess" one's faith.
- In medieval Europe, this term broadened to members of religious order or secular guilds (blacksmiths, cloth makers, etc.)
- A guild is an organization created to maintain the rights and privileges of its members.
- There were two types of guilds, merchant guilds to protect traders, and craft guilds which were associations of people in the same profession.
- Associations were given their power from kings and clergy.
- Guilds regulated quality and the market, and provided services to its members.
- Professionals are white collared, do salaried technical or administrative work.
- Blue collared workers sell their manual labor for an hourly wage.
- A professional has special knowledge, a formalized education and is a member of a professional order. Uses judgment as part of their job.
- Professional societies are self-governing.
- A professional system is one that provides formal rules for the actions of professionals. The professional society grants membership and if these rules are broken, membership can be taken away.
- The professional system is supervised by the government.
- Not all professional systems are equal. In Europe, there is a strong regulating force, but in the USA, there is very little regulation (it is not required to be a member of a professional order). Canada lies in the middle.
- Professionals have responsibilities.
- Professionals are morally responsible to do ethically correct things, socially responsible to keep public health and safety at the top priority, and legally responsible to act within legal boundaries.

Lecture 2

- Associations have multiple models:
 - Social Contract Model: More responsibilities, less rights. Designed to further public wellbeing.
 - Collective Bargaining Model: Designed to further private interest. More rights, less responsibilities.
- Professional associations follow a social contract model. In Canada, organized at the provincial level.
- In Canada, a member of a professional engineering order has the right to call themselves a professional engineer.
- Before 1970, professional associations were weak. After this time, things changed.
- This is due to the quiet revolution 1960-1970. A move from a conservative to a progressive society.
- In Quebec, there are 5 primary groups which manage the professional system.

- The government of Quebec
 - Office des professions du Quebec
 - Quebec Interprofessional Council
 - Professional Tribunal
 - 46 Professional Orders
- The minister of justice (Government of Quebec) reports to the national assembly of Quebec on the operation of the system.
- The Office des Professions ensures that all orders fulfill their mission and reports to the government.
- The Interprofessional Council is composed of representatives of each professional order to serve as a panel for consultation on professional matters.
- The Professional Tribunal is composed of judges appointed by the court of Quebec. They hear appeals on decisions made by order's disciplinary council.
- There are two types of professional orders:
 - Reserved titles and exclusive practice (OIQ).
 - Reserved titles.
- The professional code describes the activities of professional orders.
- The Engineers Act:
 - Defines a member as a person on the roll of the OIQ.
 - Defines an engineer as a member of the OIQ.
 - Defines the type of work considered "Engineering"
 - Defines reserved titles.

Lecture 3

- Ethics is a branch of philosophy.
- Ethics is the analysis of behavioral choices that individuals or societies face. (What is right or wrong)
- Moral Absolutism: Morals never change and are always true.
- Moral Relativism: Morals change and are subjective.
- Ethics avoids both of these.
- Ethical frameworks are not specific to cultural or geographical situation.
- Morals are customary to culture or geography.
- Morals are personal.

Lecture 4

- Ethical Theories:
- Consequentialism (Consequence Based) - Utilitarianism
- Deontological Theory (Action Based) - Duty ethics
- Virtue Theory - (Agent)
- Consequentialism: "The ethical content of an action depends on the consequences produced"
- Utilitarianism: (The right thing to do is what brings maximum benefit (intensity and duration) to the greatest number of people)
 - Consequentialist

- Hedonistic
 - Aggregative
- Deontological Theory: Actions are only as ethical as its nature.
 - The ends do not justify the means chosen to accomplish them.
- Kant's Duty Ethics: Fulfill your duties. "DO X NO MATTER WHAT".
- Aristotle's Virtue Theory: Ethics are driven by the character of the person doing it.
 - Doctrine of the Mean: Everything must be balanced; too much of something is bad. Not enough of something is bad.
- Justice is fairness and rightness of action and ends.
 - Basic liberty rights are inalienable.
- Types of justice:
 - Procedural Justice: Justice needs to be seen to be done.
 - Corrective Justice: Fairness in rectifying things that are incorrect.
 - Distributive Justice: Redistributing among society for equality.
 - Political Justice: Fairness with political rights.
- Steps for ethical analysis:
 - Identify moral values
 - Clarify the key concepts.
 - Obtain all relevant information.
 - Consider all options.
 - Make a reason based decision.

Lecture 5

- A professional relationship refers to the services provided by an engineer to a client.
- There are two types, Ideal-Type model and Invisible Client Model.
- Ideal-Type: Client is directly dependent on engineer. The professional is autonomous.
- Invisible Client: Professional works as a salaried employee of a company.
- A contract is a voluntary agreement between two people to create a legal obligation.
- In Common Law Canada, a contract consists of a mutual intent to enter the contract, an offer has been made and accepted, benefit and motives have been considered, and the legality of the contract is considered.
- MARS model of individual behavior:
 - Motivation, Ability, Role Perception and Situational Factors
- Motivation: Direction of efforts, Intensity of efforts and persistence of efforts.
- Ability: Aptitude (natural talent), learned capabilities.
- Role Perception: Tasks and their associated duties for which one is accountable.
- Situational Factors: Internal, time, budget, facilities, External, economic.
- Leadership: Guiding and directing the behavior of others in the workplace.
 - Formal: power was given by organization.
 - Informal: unofficially given power by others.
- A leader pushes for change and new approaches.
- A manager pushes for stability and status quo.
- Power enables you to influence someone else's behavior.

- Influence is affecting the thoughts and behavior of another person.
- Authority is the right to influence others.
- Organizational Structure: Division of labor and patterns of coordination, communication, workflow and power.
- Organizational Culture is a set of values and assumptions shared within an organization.
- Major types of organizational structure:
 - Line: Hierarchical structure. Direct vertical relationships. Little horizontal communication.
 - Line and Staff: Parallel chain of line and staff (advisory/support role).
 - Functional: Teams formed based on employee's function and skills.
 - Project or Team: Cross functional teams working on a project. Employees report to two managers. Project manager and Personnel Manager.
 - Matrix: Cross functional teams are built from a pool of employees of different types.
- Aristocratic Leadership: Leaders take directive, controlling actions to enforce rules and activities.
- Democratic Leadership: Collaborative and responsive interactions with team members.
- Laissez-Faire Style: Leader who fails to take the responsibility of their position.

Lecture 6

- Conflict of Interest: When a person has a private interest sufficient to influence the objectives of their official duties as a professional.
- Engineers have the right of careful refusal, the right to refuse to engage in an unethical behavior.
- Trust is the ability to rely confidently on people, objects or circumstances.
- To build trust, one must disclose their limits, maintain integrity and transparency, maintain availability and diligence, be independent and impartial, maintain client confidentiality and be honest about fees.
- An engineer can cease to act for the client under certain grounds: conflict of interest, illegal demands, client ignores engineer's advice.
- If the engineer is to withdrawal, they must give advanced notice.
- Organizational loyalty is a commitment and attachment to one's company.
- Loyalty is subordinating self-interest to the interest of others, and a product of a relationship.
- Whistleblowing is a last resort. If you choose to do so, be prepared to lose your job.
- Whistleblowing is informing the public or higher management of unethical or illegal behavior by an employer or supervisor.
- Corporations tend to fire whistle blowers and intimidate others who are likely to do so.

Lecture 7

- The professional code mentions three derogatory acts to all professions: discrimination based on race, colours.. etc., claiming to be a specialist when you are not, and sexual misconduct.
- Derogatory acts for engineers: participating in illegal practice, using inducements to market your professional services, seeking legal action against a colleague before applying to the order,

refusing to comply with directions from the order, refusing to present yourself to the order when requested.

- The OIQ controls membership with conditions, inspection, discipline, conciliation and controlling the ability to practice.
- In Quebec you must hold a permit from the OIQ and be entered on the roll.
- You will lose membership if you fail to register every year, meet registration requirements, if you are already stricken off the roll, if you decide to leave the order, or if your permit is revoked.

Lecture 8

- Engineers must respect their obligation towards humanity.
- Engineers must ensure the protection of the public.
- Fundamental freedoms: Conscience/Religion, expression, peaceful assembly and association.
- Fundamental rights: democratic, mobility, legal and equality.
- Prejudice is an opinion formed without taking time to judge fairly based on incomplete and stereotyped information.
- Discrimination: treating people differently due to race, gender or religion.
- Harassment: Discrimination when a person is subjected to unwanted behavior that offends, demeans or humiliates.
- Direct discrimination: Discrimination that is directed directly to a person.
- Adverse Effect Discrimination: Discrimination that happens by applying a rule or policy uniformly.
- Systemic Discrimination: a discrimination that is rooted in accepted ways of doing things in a business, profession or occupation. This tends to prevent categories of people from achieving their goals. (Glass Ceiling)
- Engineers have duties towards life and the environment.
- Engineers have duties to be honest.
 - Honesty is telling the truth, following scientific facts, avoiding inappropriate means and showing respect to colleagues.

Lecture 9 & 10

- Two types of law :
 - Public Law: Governs relationship between the state and the individual.
 - Private Law: Governs relationship between individuals.
- The legal system is the system for interpreting and enforcing laws, and the set of institutions which enforce the law.
- Types of law: civil, common, mixed, religious, and customary.
- Civil law: laws are written into codes and created by legislature, decisions are based on law and precedence has no value.
- Common law: laws are based on codes and previous cases, created by legislature and judges, decisions are based on laws and precedence, and statutes are interpreted based on precedence.

- Quebec has mixed law, criminal matters use English common law, and civil and property matters use French civil code.
- Types of intellectual property: copyright, trademarks, patents, industrial design rights, integrated circuit topographies.
- Handled by the Canadian intellectual property office.
- A patent is granted by the government and gives inventors exclusive rights to their invention.
- In Canada, a patent is valid for 20 years.
- A trademark is a word, symbol or design used for identification.
- Ordinary marks: brand names etc.
- Certification marks: indicates a product meets a certain standard.
- Distinguishing guise: distinguished packaging or shaping.
- Copyright is the exclusive right to copy a creative work. In Canada, copyrights last for life plus 50 years after creator's death.
- Industrial Design: Features of shape, configuration, pattern or ornament applied to an article.
- Integrated Circuit Topographies: 3D configuration of electronic circuits in a microchip and semiconductor chip. ICT gives exclusive rights on copying and commercialization for 10 years.
- In Canada, occupational health and safety is governed by federal and provincial.
- It is the supervisor's responsibility to ensure that workers use prescribed equipment, works are advised of hazards, and to take precautions to protect workers.
- It is the employee's responsibility to work in compliance with regulations, to report hazards, and to use the prescribed equipment.
- The employee has the right to refuse to do unsafe work.
- Due Diligence means to take all reasonable precautions to prevent an issue.
- Liability is responsibility that is backed by the power of the law.
 - Contractual: Responsibility owed within the bounds of an explicit contract.
 - Extra-Contractual: Responsibility that is owed by tort damages.
- In Quebec:
 - Civil Liability: Responsibility to pay for damages or harms caused.
- Compensation is given if an act of omission, a consequence and a cause-effect relation between the two are proven.
- In the Common Law: Buyers bear liability. "Caveat Emptor" Buyers Beware.
- Caveat Venditor: Seller Beware.
- Liability insurance is purchased to protect against liability risks.