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## Engineering Ethics with Emphasis on Ethical Identity

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### Abstract

Need to ethics and adhere, is necessity and undeniable, in any profession. Also to solve problems and moral nodes, need to correct and desired understanding of ethics. Engineering as a profession should be subject to the rules and ethical standards, because the development of professional ethical principles is utmost importance in relationship with others. If the subject of professional ethics is how members of a profession should, or should not, affect others in the course of practicing their profession, then engineering ethics is an essential aspect of engineering itself and education in professional responsibilities should be part of professional education in engineering.

The present study is an analytical–descriptive research that relies on library studies and uses a logical argument in order to analyze, and aims to identify and understand the ethical concepts of engineering. Results indicate that there is a profound relationship between ethics engineering and individual ethics which is originating from the culture of the society, So that any aspect of engineering ethics is based on the cultural backing.

**Keyword:** Engineering Ethics, Professional ethics, Individual ethics, Ethical culture

### Introduction

Engineering ethics is professional ethics, as opposed to personal morality. It sets the standards for professional practice, and is only learned in a professional school or in professional practice. It is an essential part of professional education because it helps students deal with issues they will face in professional practice. Engineering ethics can be taught in a free-standing course, but there are strong arguments for introducing ethics in technical courses as well (1).

Engineering practical done by the engineers and have profound effects on others and their life. Because engineers create products such as food, shelter, energy, communications, health and improve

Protection against natural disasters and increase welfare and beauty of our daily lives (3). And Engineers should have moral obligation to keeping the highest safety, welfare, health and safety and economic efficiency and be equipped with tools until be able grapple with difficult ethical problems that are encountered (4). Because an engineer with the engineering ethics in addition to knowledge and creativity, can arrange welfare for himself and society and more respect to health and safety of society, save in resource consumption, reduce environmental pollution and finally arrange the joy and peace for themselves and society(5).

A significant portion of time and human activities paid to career and dedicated profession and in the meantime, the engineering profession has a role of essential in living spaces and human activity. In where ever, you are in spatial that designed by environmental engineers and architects. And what is your opinion and view is product of endeavors their professional experience and career and definitely not only change and interpretation in the production of ethical funds, but their underlie behavior and action that can be ethical assessment.

### Method

The present study is an analytical – descriptive research that relies on library studies and uses a logical argument in order to analyze, interpret and compare the discussions of the study.

in addition to understanding the concept and meaning of the word ethics, evaluation engineering ethics from the perspective of application to the monitoring and Iranian culture. Also discover origin of ethics and ethical aspects in different professions. So aided by rationalize ethics, in the individual aspects and Engineering in field of application and according to the concepts by the documentary and also by relying on the statement of Charles Edwin “It is an essential part of professional education because it helps students deal with issues they will face in professional practice. The best way to teach engineering ethics is by using cases—not just the disaster cases that make the news, but the kinds of

cases that an engineer is more likely to encounter. Many cases are available, and there are methods for analyzing them (1)” delivers case Study consistent with Iranian culture.

According to Groot’s viewpoint, there is no doubt that any research program of theory must have a logical coherence. Preliminary logical systems have a tendency to innovation, to the extent that it leads to a conversation at the level of mental patterns (21).

### **Discussion**

Let me begin with an obvious but important distinction, that between morality and professional ethics. Morality, as we shall use that term, refers to those standards of conduct that apply to everyone rather than only to members of a special group (20). To understand the standards will be quoted experts in the field. Quoting Harry Chi (1385), right or wrong, good knowledge of evil, and recognition of the virtues, are constitute ethics fundamental issues (6). And also Quoting Ibx T (1382); ethics concepts such as trust, honesty, integrity, faithfulness to covenant to others, justice and equality and the virtues of citizenship and service to the society. Ethics in means, distinguish right and wrong and good and bad, was always controversial subject philosophers and have spoken as a tributary of the philosophy(7) and finally Quoting Kant; if anyone is ethical, as well wise and the same meaning of freedom. Virtues, not only happiness but also are freedom and noble man. Benefit and moral virtue (good willpower, compassion) is the highest good and against it are all other values secondary (8,19). Ideally, these standards are ones that every rational person wants every other to follow (20).

We were all quite young when we learned such basic moral rules as: don’t lie; don’t kill; don’t cheat; keep your promises; don’t steal; and so on. We were still quite young when we learned that these rules have exceptions (for example, “except in self-defense” for “don’t kill”) (20). Now and then, we may change our view on how to interpret a particular rule or exception for example, we may come to think that it is possible to lie without saying anything false (for example, by omitting some fact necessary for understanding what we do say)(1). So we can say that moral principles and criteria for thinking and human behavior that enables for life and improve with the observe the rights each other and the environment (natural and synthetic), duties of human as compared self and the environment (including anyone and nature) and in religious doctrines than the creator.

In defining professional pay ethics issues and the ethical questions and also to principles and the ethical values a group of professional such as professional engineering, medicine or... and mentioned overseeing the professionals voluntary actions within their professional activities(10). On the other hand In defining And understanding of engineering ethics, based on professional ethics, which expresses moral code acquired from the nature of the profession or occupation (11). Not so with professional ethics. By “professional ethics” (henceforward in this paper, just “ethics”) we refer to those special morally permissible standards of conduct that, ideally, every member of a profession wants every other member to follow, even if that would mean having to do the same. Ethics applies to members of a group simply because they are members of that group (2). It is worth mentioning that professional ethics are each group specific to the same group. For example, the Medical ethics applies to people in medicine (and no one else); and engineering ethics applies to engineers (and no one else).

The special standards that constitute engineering ethics are what are to be taught. They have been formulated in different codes of ethics, in formal interpretations of those codes, and in the less formal practices by which engineers pass on the special ways they do things to each new generation of engineers. So, except for those students lucky enough to have a mother or father who is an engineer, no one is likely to learn much about engineering ethics except at engineering school or while practicing engineering. Engineering ethics is as much a part of what engineers in particular know as factors of safety, testing procedures, or ways to design for reliability, durability, or economy. Engineering ethics is part of thinking like an engineer. Teaching engineering ethics is part of teaching engineering (1).

In fact, the foundation of scientific ethics, professional self-understanding. Academics And professionals are just understanding of their professional work and activities, its philosophy and relation to the lives of people who are achieved to understand the moral and therefore in our relationship with nature And the universe, with the capture of technical research topics, together with other professionals and social stakeholders And society, respect for the values valid and find a feeling of obligation to the values (12).

**Results**

As previously mentioned, the best way to teach engineering ethics, use of appropriate case study, which is compatible with the culture and society that an engineer are working in the professional filled And daily lives. Because this cases, in addition to availability, been including analytical methods. Because engineering ethics is part of thinking like an engineer. Teaching engineering ethics is part of teaching engineering.

In this case with the cases samples of analyzed by organizations and organs, one of the most suitable cases, is the basic engineering and technology, Chicago, that a professional ethics for engineers has designed that includes principles And Fundamental rules; Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

1. Using their knowledge and skill for the enhancement of human welfare
2. Being honest and impartial, and serving with fidelity the public, their employers and clients
3. Striving to increase the competence and prestige of the engineering profession
4. Supporting the professional technical societies of their disciplines.

**The fundamental Canons;**

1. Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
2. Engineers shall perform services only in the areas of their competence.
3. Engineers shall issue public statements only in an objective and truthful manner.

4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.
5. Engineers shall build their professional reputation on the merit of their services and Shall not compete unfairly with others.
6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the profession.
7. Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional development of those engineers under their supervision (13).

Due to the aspects of raised by the Chicago Council on engineering and experts and also considering the principles of the culture of each country and the region can be stated: Ethical aspects of in engineering profession is relies on the individual moral support and this moral support through ethics training that everyone is learned in life time somehow with regard to culture and family system and community.

It should be noted that ethical culture encompassing And including; deeds, beliefs And standards of right and wrong about the people or groups and including agents such as corporate culture, encourage systems, noble behavior, promotion policies, system performance measurement And management behaviors(14,15). In general ethical culture caused in organizations of values, policies and activities of individuals (16). Ethical culture of the organization is considered, the most important factors in determining unethical behavior in organizations(17,18). Because culture and ethics are an important for any matter.



Figure 1: Moral hierarchy in any profession(Source: Authors)



Figure 2: Basic ethical codes in each hierarchy (Source: Authors)

**Conclusion**

The need for ethics and abide by rules And according to the standard, in addition to the funds Code of Ethics and civil rights of every individual is necessary in work as a professional. Laws and ethical standards in every society expresses cultural patterns and social structure of the community and based on the individual's lifestyle (family organization) And the method of educating of standards to the next generation is due to the type of culture and society.

Students. But to fact, the training and transfer of engineering ethics standards relied on personal morality and individual ethics subtype of type culture that that arises from the society. Of course, aspects such as family structure, lifestyle, values, policies, etc., are considered to part of the culture. In the end the authors believes that the below moral aspect with attention of Iranian culture and pay attention to patterns and rules of life by traditions could be used as the moral aspect of engineering in Iran.

Engineering ethics education be transferred by parents (who are engineers) or specialist schools for

Sub-Categories	The main principles
skills and knowledge standards of excellence the preservation of cultural heritage and natural respect for human rights the welfare, safety And community health	<b>General obligations</b>
Services to protect the public interest respect for civic responsibility Support And respect the right of each citizen	<b>Commitment to the people</b>
having required competencies having candor And trustworthiness earning the trust And confidentiality of information responsibilities and professional commitments objectivity and impartiality	<b>Commitment to customer</b>
honesty And justice maintain the dignity And nobility having the necessary skills and knowledge self-respect, enforcement And bravery	<b>Commitment On professional</b>
maintain a professional environment Observance And professional development recognition and professional recognition rule of law and discipline to be independent	<b>Commitment to coworkers</b>

Table1: Code of professional ethics for Iranian engineers (Source: Authors)

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### **References**

1. Charles Edwinharris. JR, Michael. D, Michael. P, Michael. J. R: Engineering Ethics: What? Why? How? And When? Journal of Engineering Education, 1996, pp: 93-96.
2. Michael Davis, "Thinking Like an Engineer: the Place of a Code of Ethics in the Practice of a Professional," Philosophy and Public Affairs 20, Spring 1991, pp: 150-167.
3. Martin. Mike, Engineering Ethics, Translation: Nader.M, Tehran: Publication Mary Pourzand.V, 1387, pp: 45.
4. M.W.Martin,R.zingerinSch,in Ethics Engineering. ,MC-Hill Graw, 2005.
5. Bahadori nezhad. M, Tips on Engineering Ethics, Ethics in Science and Technology Journal, Winter 1385, 1(1), pp: 6.
6. Harry J. Gensler, a new Introduction to Ethics, Translation Bahraini. M, Tehran: Publication The starry sky, 1385, pp: 30.
7. Hess Ibex T, Ethics, Management, Translation: Arabi. S & Ezadi. D, Tehran: Cultural Research, 1382, pp: 129,113.
8. Edwards P. Ethics, in Encyclopedia of Philosophy, New York, MacMillan 1967,p. 81-112
9. Michael Davis, "The Moral Authority of a Professional Code," NOMOS29 (1987), pp. 302-337
10. Toffler, Barbara Ley: Business Responsibility. In: Robert Gandossy et. Al., (Eds), Leadership and Governance From the inside out, John Wiley and Sons; New Jersey, 2004.
11. Arasteh. HR, Jahed. HA, Ethics in Universities and Centers of Higher Education, An Option to Improve Behavior, Journal of Transplantation Science, 1390, 2(1), pp: 31.
12. Dahlbom, Bo, Lars, Mathiassen: professional Code of Ethics, in: Computers and Society, Vol. 24, No. 2. 1994, pp: 485-498
13. ABET: Code of Ethics of Engineers, Accreditation Board for Engineering and Technology, Chicago, 2006a.
14. Canadian Nurses Association. (2010). Ethics, relationship and quality practice environments. Ethics in Practices for Registered Nurses.
15. Singhapakdi A, Vitell S J. (2007). Institutionalization of ethics and its consequences: a survey of marketing professionals. Journal of the Academy of Marketing Science; 35(2), pp: 284-294.
16. Koonmee K, Virakul B. (2007). Ethics, quality of work life, and employee job-related outcomes: A survey of hr and marketing managers in Thai businesses. Berlin: ISQOLS Conference.
17. Deal TE, Kennedy AA. (1982). Corporate cultures. USA: Addison-Wesley.
18. Casey DP, Davidson RA, Schwartz BN. (2001). The effect of organizational culture and ethical orientation on accountants' ethical judgments. Journal of Business Ethics; 34 (2), pp: 101-121.
19. Kant, Immanuel, moral philosophy courses, translation; Manouchehr Sanei, Tehran: Naghsh va Negar, 1387, pp: 435.
20. Michael Davis, "The Moral Authority of a Professional Code," NOMOS29, 1987, pp: 302-337.
21. Groot, Linda & Wang, Davi (2012). Research Methods in Architecture. Translated by Alireza Eynifar, 6<sup>th</sup> Edition, Tehran: Tehran University, pp: 283.