

Ethics and Law on the Electronic Frontier

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Abstract. The new electronic relations have brought as much benefits as duties. The society uses more often computers in every day life than ever. Unfortunately, cyberspace bounds are huge and its regulation is very complicated. In many cases the users are responsible for his security. That is why Electronic Law knowledge is useful and important for the new society.

The most powerful computer and net users are those who are educated in Computer Science. Various authorities in the field of Computer Science education are urging the necessity of topics on legal regulation of the electronic society. Several universities in Latvia starting from the 2002/2003 study year have implemented a new course on “IT Industry Standards, Legislation, Labour Protection and Ergonomics”. The topic is extended considering the students being programmers, computer users and hired workers.

This paper describes the demand for teaching the legal regulation of electronic processes to Computer Science students, gives an overview of the course preparation, teaching and findings received from the first year experience.

Key words: education in informatics, IT legislation, IT law, IT professional ethics, programmer knowledge on legislation.

1. Introduction

The law is the instrument through which a technological revolution [the Internet] is undone. And since we have barely understood how technologists built this revolution, we don't even see when the lawyers take it away.

– Larry Lessig (*The Future of Ideas*, 2001)

The new rapidly changing electronic world has changed many sides of our everyday life. Computers and Internet brought us new opportunities and new unknown difficulties and duties along. Since electronic relations became popular and available for most people all over the world, governmental and jurisdiction forces try to find the correct and effective way to regulate the new cyberspace.

Unfortunately, technological progress has far overtaken the speed of law improvement. A review of literature in technology legislation highlighted the need of new law regulation (Barlow, 1994; Dyson, 1995; Kinis, 2000; McFarland, 1990; Rasch, 1996). New crimes often do not fit the parameters of the preexisting legal framework. That's why in cases, where new laws have not kept up with the changing face of crime, authori-

ties have used traditional statutes to prosecute individuals who commit forms of computer abuse (Rasch, 1996).

Many questions that are clear in the material world, as paper documents, signatures, commercial relations and privacy, have caused problems in the nonmaterial world of cyberspace. It has been a slight moment since technology overtook our everyday life till the society divided into several groups:

- those, who don't know what a computer is and whom we will not pay any attention to;
- simple computer users, who use computer eventually;
- advanced computer users, who use computer in everyday life;
- hackers, who get profit or at least satisfaction of crossing the borders of simple usage of computers and the Internet.

The aim of this research is to implement a new course on the field of IT legal regulation and ethics in three higher education study programs in Computer Science in Latvia.

This paper begins with an insight to the topic outset, the motivation and objectives for starting the research. In the next chapters the author reports about the research overview, topic actuality and volume. Then information about the teaching and the findings are presented.

2. Ethics and Law on the Electronic Frontier

This chapter is devoted to different types of offence in cyberspace. The author explains the most common crimes, although there are plenty of different other violations, that can be processed by various means of electronic communication.

2.1. Copyright

The digital age has brought a great deal of uncertainty with respect of nature of intellectual property and information, as well as the idea of property itself. Digital technology is detaching information from the physical plane, where property law of all sorts has always found definition (Barlow, 1994). According to Esther Dyson (Dyson, 1995), in a new environment, such as the gravity field of the moon, laws of physics play out differently. On the Net, there is an equivalent change in "gravity" brought about by the ease of information transfer. We are entering a new economic environment – as different as the moon is from the earth – where a new set of physical rules will govern what intellectual property means, how opportunities are created from it, who prospers, and who loses. This appears to be a simple set of related questions to provide answers to.

Cyberspace produced also new intellectual property items as computer graphics, electronic literature, software, databases with a great amount of useful information and even such notion as domains that are acknowledged as an intellectual property and are protected by the World Intellectual Property Organization (WIPO, 2003).

The USA National Writers Union in their working paper on Electronic Publishing Issues (National Writers Union, 1995) expresses their opinion that the world infosphere has the potential to become a large electronic marketplace for authors where commercial vendors will transmit and license the intellectual property that is created in a variety of formats.

The operations with information became so simple that you can copy, print, change or even eliminate a big amount of information in a couple of seconds. The greatest problem in connection with electronic data processing is its regulation and control (Barlow, 1994). Unfortunately, the means of controlling the information stream are very poor, as well as it is simply impossible to supervise the global on-line world. That's why the world jurisdictional practice in this matter is to assign the responsibility of protecting the copyright to the authors themselves, although legislation prescribes the sanctions and distributes special acts on copyright on electronic frontier. According to John Perry Barlow (Barlow, 1994) the protections that we will develop will rely far more on ethics and technology than on law.

2.2. *Privacy Problems*

As the digital age is taking over our everyday life, more and more computers stay on-line day and night. As a result a huge quantity of information may become accessible for unauthorised users on the network.

According to Marcia S. Smith in her report "Internet Privacy: Overview and Pending Legislation" (Smith, 2003), Internet privacy issues encompass concerns about the collection of personally identifiable information from visitors to government and commercial Web sites, as well as debate over law enforcement or employer monitoring of electronic mail and Web usage.

The examples of the violations of privacy rights in cyberspace are as follows:

- Improper and unsafe private information passing via the Internet (for example, shopping, booking airplane tickets, etc.) may cause sensitive information loss (Berghel, 2001; Mazure, 2003).
- Using Employee monitoring software without people knowing employers may violate privacy (Berghel, 2001; Dichter and Burkhardt, 1996; Luhn and Spanbauer, 2002).
- Some companies in marketing purpose collect private information for analyzing the society sphere. The useful information about one's incomes, credit history etc. can be bought or collected using hidden private information channels as cookies or even from his or her computer by direct connection (Berghel, 2001; Tynan, 2003).

The misuse of personal data made easier by the ability to harvest vast amounts of data inexpensively and conveniently through the Internet, represents the greatest potential threat to privacy in the new millennium (Professional Practice and Ethics, 2002–2003).

That's why the legislation has to provide the following principles of privacy protection:

- the right of individuals to know what information is being collected about them;

- the right to know how that information is being used;
- the right to take legal action if it is misused;
- the right of individuals to refuse the private information collecting;
- the right to access collected personal data and modify it in case any inaccuracies are present;
- the agencies collecting private information should be prohibited from using it in any purposes other than those specified at the time of the collection without explicit permission from the individuals involved.

Many countries have proceeded in the privacy law improvement considering new cyberspace problems. European privacy law can be divided into 3 generations (Kinis, 2000):

1. “The first generation privacy acts” are private data laws assumed before Convention No.108, which included the automatically processed private data protection.
2. “The second generation privacy acts” are related to the period from Convention No.108 till Directive 95/46 approval in 1995.
3. “The third generation privacy acts” are related to the present period and regards the new privacy protection legislation in Europe, modifying the existing acts on the base of previously named Directive.

This legislation evaluation is a good progress, but still the control of privacy violations is very difficult to proceed and the law-courts have to improve their experience in the cases of electronic privacy violations.

2.3. *Computer Communications and Freedom of Expression*

The freedom of expression is the foundation of fundamental human rights. The rights to express your thoughts and opinion as well as to communicate freely with others affirm the dignity and worth of each member of society.

Computer communications is a new way to share information, to express thoughts and simply to communicate in a new information space, called cyberspace. The technological means of communications allow to publish, send and receive information in a couple of seconds.

Although everyone is empowered to express his thoughts, the freedom of expression is limited by the other person’s rights (for example, privacy, dignity, etc.). We have to remember that the size of electronic arena is huge and any unsafe expression can cause us serious problems (ACLU, 1997; Tribe, 1991).

2.4. *Electronic Commerce*

Electronic Commerce is a new commercial world consisting of material and electronic goods, self-acting shops without any salesman, electronic marketing and agreements, etc. The legal regulation of E-commerce is very complicated and not complete yet.

Many countries succeeded in E-commerce regulation in terms of protection of personal data (e.g., Council of Europe directive 95/46/EC), preliminary work on digital signatures (e.g., Council of Europe directive 99/93/EC), distance contract regulation and

others (Mazure, 2003). United Nations International Market Committee UNCITRAL prepared a Model Law on Electronic Commerce with a guide to enactment (UNCITRAL, 1996). Unfortunately, all these legislation sources solve only a handful of problems related to electronic commerce (Kinis, 2000). Such questions as tax collection and contracting protection guarantee still remain uncertainty. It's often hard to verify if the E-place is reliable but the responsibility frequently lies on the customer.

Although the space and means of electronic commerce are virtual, people who are involved in the deal, as a result operate with real money. The technologies used by parties are not always faultless, that's why it is very important to know the nuances of electronic business and its legal regulation.

2.5. *Computer Crime*

Computer crime is progressing with every year in quantity and quality. Let's examine an overview of computer crimes that happened in different sights of the world.

Australia. A book called "Underground" by Suelette Dreyfus (Drefys, 1996) details the true story about an Australian computer underground group who wrecked havoc for over a decade on the Internet. They hacked into supposedly secure computer systems such as Citibank, the Pentagon, NATO, the FT100, NASA, Lockheed-Martin, Deutsche Telekom, and Australian Telecom, as well as the Defence Data Network's NIC, one of the backbones of the Internet. It was only after raids by the Australian Federal Police and the police agencies of other countries that this group was finally brought down. They were arrested, and brought to trial under the Australian Criminal Code provisions passed in the Telecommunications Act of 1991, which outlined much of the laws surrounding computer crime in Australia.

Canada. In October of 1992, the North York Metro Police Department arrested a 15 year old boy, raided his home, and confiscated two computers. According to BellCanada and Metro police, the young individual in hand was the notorious 911 dialer that had periodically clogged up the 911 lines for the entire Toronto area, severely hampering emergency services. Apparently, the youth had dialed into the 911 service by illegally breaking into the phone system, rerouting the call through several United States systems, before finally reentering the Toronto area. When arrested, he was charged with theft of telecommunications, 24 counts of mischief, and 10 counts of conveying false messages. What startled authorities, however, was not the crime itself, but the degree of complexity with which the youth had carried it out. It sent a message to Canadian authorities everywhere that computer crime can be committed by anyone, and must be rigorously prosecuted (Mallan, 1992).

What makes this issue more complicated is that these precedents of crime are often made from foreign soil for only minutes, maybe even seconds. Not only is it currently difficult to trace, prosecute, and reach a desired verdict, but if the case crosses many national borders, it may be almost impossible to secure extradition or decide which country deserves ultimate jurisdictional power over a given case.

The world legislation on Computer Crime since then has grown and much progressed. Many acts are added to the national criminal codes and civil law. The United Nations has

created a United Nations Crime Prevention and Criminal Justice Programme to compile statistics and mediate criminal disputes between countries. This and other programs will hopefully help to overcome the growing problem of computer crime and prelude a standardized framework for global computer crime regulation (Kim, 1997).

Parties able to process computer crime

As for people, who are able to cause problems in cyberspace, we have to mark out 2 society groups, which were mentioned earlier in this paper. These are advanced computer users and hackers. The best challengers for these groups are people, who are educated in Computer Science. That's why Computer Science education as a priority ought to include topics on Ethics and Law basics on the Electronic Frontier.

3. Research Overview

The first level professional higher education program "Information technology and telecommunications" has been prepared during the European Union Phare program "Professional education" that took place in Latvia in 2000. This program included courses, which provide the program graduates with primary knowledge base on software engineering. In addition to engineering and programming the program apprehends a course that would educate students in such areas as industry standards; legislation and ethics (see Table 1). An abstract for the course consisting of primary aims, course volume, prerequisites, content, organizing and structure, assessing conditions, and necessary literature was worked out during the Phare program.

Table 1
IT legislation course worked out during the Phare program

Course title	Obligation	Hours
IT industry law basis and standards	Essential – the topic is a part of the core	48

The topics included in the course are as follows:

- Law and standards.
- Engineering ethics code.
- Intellectual property protection basis.
- Copyright act and software.
- Databases protection.
- Cyber crime and criminal law.
- Unsolved problems.
- Freedom of expression.
- Personal data protection.
- Information system security.
- Programming contract peculiarities: delivery, labour-intensity, copyright transition. Work contracts and author contract.
- Information technology terminology and its development basis. Vocabulary and databases.
- Quality system. ISO 9001 and CMM standards.
- Project quality plan.
- Engineering standards system.
- Software documentation development.
- User guide development.
- Software code design.
- Software operation description, software requirements specification.
- Software design development.
- Testing documentation.

The knowledge of legal and ethical basis is included in several other important issues on software engineering education. These are Computing Curriculum – Software Engineering Volume 2003 which is prepared by IEEE Computer Society and the Association for Computing Machinery (Computing Curriculum, 2003); and Guide to the Software Engineering Body of Knowledge (SWEBOK), a project of the Software Engineering Coordinating Committee (SWEBOK, 2001).

Computing Curriculum urges the necessity for graduates of a Software Engineering program to be able to design appropriate solutions using engineering approaches that integrate ethical, social, legal, and economic concerns. This is presented as a Professional Practice component that is concerned with the knowledge, skills, and attitudes that software engineers must possess to practice software engineering in a professional, responsible, and ethical manner. The study of professional practices includes the areas of technical communication, group dynamics and psychology, and social and professional responsibilities. There are two courses connected with the topic (see Table 2).

Table 2
IT legislation course worked out by Computing Curriculum

Course title	Obligation	Level
Codes of ethics and professional conduct	Essential (the topic is part of the core)	Comprehension level – understanding information and ability to grasp meaning of material presented.
The nature and role of software engineering standards		

In its turn SWEBOK gives an extended explanation of the education area on IT legislation and ethics. SWEBOK course “Social, Ethical, Legal and Professional Issues” contains topics as follows:

- Historical and social context of computing.
- Philosophical ethics.
- Intellectual property.
- Copyrights, patents, and trade secrets.
- Risks and liabilities.
- Responsibilities of computing professionals.
- Computer crime.

There are 13 higher educational institutions in Latvia which train specialists in the IT sector. All of the professional education courses are based on Phare program model course. Unfortunately, by the time this course was added to the study program there has been no special teaching literature and no lecturer for managing this new trend in IT education.

This revealed a necessity for a new course that would deepen students’ understanding in ethical and legal concerns, as well as the teaching literature that would help to implement this new course easier.

4. The Research Procedure

Exploring the topic of the research the author has overviewed different information resources on electronic legislation and ethics that could be grouped as follows:

- comprehensive electronic legislation (Forrester, 1997; Kinis, 2000; Latvian legislation, 2001; Latvian Ministry, 2002; Tribe, 1991);
- electronic ethics and etiquette (McFarland, 1990; Shea, 1994);
- freedom of expression (ACLU, 1997);
- copyright in the Internet (Barlow, 1994; Dyson, 1995; National Writers Union, 1995; WIPO, 2003);
- internet privacy (Dichter and Burkhardt, 1996; Berghel, 2001; Electronic Privacy Information Centre, 1994; Luhn and Spanbauer, 2002; Smith, 2003; Tynan, 2003);
- electronic commerce (Mazure, 2003; Information Technology and E-commerce Law Focus, 2003; UNCITRAL, 1996);
- software consumer protection (Kirsteins, 2001);
- cyber crimes (Drefys, 1996; Godwin, 1995; Kim, 1997; Mallan, 1992; Rasch, 1996);
- university courses offerings (Professional Practice and Ethics, 2002-2003; Ethics and Law on the Electronic Frontier, 2003; Computers, Ethics, And Social Responsibility, 2001; Social Implications of Computer Technology, 2001);
- legislative sources (Electronic Privacy Information Centre, 1994; Forrester, 1997; Latvian legislation, 2001; Latvian Ministry, 2002; Information Technology and E-commerce Law Focus, 2003; UNCITRAL, 1996; WIPO, 2003).

Searching information about the course materials through the greatest universities home pages you can find that Electronic Ethics and Law are rather often encountered in some related courses (see Table 3).

All these sources have served as a basis for a resumptive course book on electronic legislation including analysis on the world law acts.

The next step in the research was to appropate the course material in practice.

Table 3
IT legislation courses in the world higher educational institutions

Educational establishment	Course title	References
Massachusetts Institute of Technology	Ethics and Law on the Electronic Frontier	(Ethics and Law on the Electronic Frontier, 2003)
Stanford University	Computers, Ethics and Social Responsibility	(Computers, Ethics, And Social Responsibility, 2001)
Cambridge University	Professional Practice and Ethics	(Professional Practice and Ethics, 2002–2003)
University of California in Berkley	Social Implications of Computer Technology	(Social Implications of Computer Technology, 2001)
Technical University of Berlin	Informatics and Society	(Informatics and Society, 2003)
University of Tartu	Information technology policies	(Information technology policies, 2003–2004)
Kaunas University of Technology	Informatics in social context	(Informatics in social context, 2003)

5. Teaching

In September, 2002 there was initiated a new extended course “IT industry standards, legislation, labour protection and ergonomics” in 3 higher educational institutions’ programs (see Table 4).

The aim of this course is to give a concept of the IT industry controllable problems and to deepen the students understanding of their rights. The course correlation with other program courses can be shown as follows (see Fig. 1).

The course was divided into two independent parts:

- IT industry standards;
- IT industry legislation, labour protection and ergonomics.

The author participated in lecturing the second part of the course.

5.1. Course Content

In relation to electronic legislation the following topics were offered:

- Law basis, terminology.
- What is information? Information expression, distribution and extraction.

Table 4
IT legislation study programs in Latvia

Educational establishment	Study program	Course obligation	Term	Hours	Number of students*
The Riga Technical University	1st level professional higher education program “Programmer”	Obligatory	5	32	15
University of Latvia	1st level professional higher education program “Programmer”	Obligatory	3	16	80
University of Latvia	Bachelor program in Computer Science	Alternative	3	32	30

* Average number of students per term

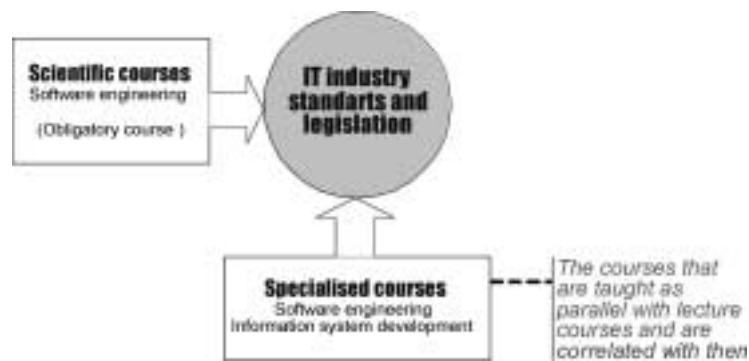


Fig. 1. The course correlation.



Fig. 2. Latvian E-university space.

- Governmental information systems. IS security requirements.
- Documents, electronic documents and the differences.
- Private person data, processing of data and legal regulation.
- Intellectual property – patent law, copyright law.
- E-commerce and the legal problems connected with that.
- Labour law and ergonomics.

The course consisted of lectures, during which obligatory teachable material was being presented, and seminars, which gave the students possibility to initiate a discussion on the problems they were interested in.

The course material with assignments has been shaped as a Latvian E-university space component and is offered for distance learning. The electronic learning space is a great helpmate in the learning process. It turns studies into an interactive process, where the teacher can leave messages and post actual information for students, where students can ask questions, discuss different topics and reach the electronic version of the learning materials, where all the news are organized in a special calendar, quizzes and assignments can be held electronically and the estimation process can be proceeded automatically (see Fig. 2).

5.2. Findings

In order to improve the course content and to make it more attractive to students, the author included some special questions based on the course material in the last test work, which could provide the information about students' interests. The questions were given as follows:

1. What is the main progress in electronic legislation?

2. Whether electronic documents are reliable or not?
3. What topics on electronic legislation are necessary for programmers, network administrators, any computer user; and why?

Analyzing the answers to the test questions the author has formed TOP3 of the topics that seemed for students the most interesting and useful.

5.2.1. *TOP1. Electronic Signatures and Documents*

This topic was interesting for students not only from the point of law, but from the point of technologies as well. The legal acceptance of the electronic documents will help to solve electronic commerce problems, will quicken the bureaucratic formalities administer in the governmental sector. Although many students are looking forward the electronic signatures coming into our every day life, there are many students who don't trust the stability of this technological solution.

5.2.2. *TOP2. Copyright*

Everyone ought to have perception of the author's rights, the rights to their intellectual property and its protection, if necessary. Internet made the copyright protection and controls a very complicated task, that's why everyone have to know in which cases who has rights to operate with his work, to change it, to make additions, circulation, coping etc.

Great attention from the students is paid to the intellectual property that is produced being in labour relations. As it is known, according to the Latvian law copyright for an intellectual property is owned by the employers, if the contract doesn't provide any other conditions. Unfortunately, not every student knows about copyright. Software is produced with the name of company, which it is produced by, and the names of authors later can be found nowhere, although each author has rights to place his name in the software authors list.

5.2.3. *TOP3. E-commerce*

Electronic commerce is interesting for students as a technological innovation and of course as a new space of electronic transactions. Many students practise web designing and development and face the difficulties of privacy, electronic contracts, etc. in cyberspace. Students are looking forward the improvement of legal regulation corresponding to unsolved problems of E-commerce.

5.2.4. *Employment Rights Protection*

The topic that is not related to information technology field, but that was named by students as useful to know is employment rights protection. Employment problems are underlined as an important topic because of its urgency. Very many students begin to work already in the early academic years. The topic of the course contains many questions that everyone need to know before starting on a job – beginning with engaging, contract drafting and ending with working time assignation, granting of leave, women work particularities and ergonomic knowledge.

Does everyone accurately read signing contracts and get acquainted with the internal terms of the company you are going to work in? Contract reading early in life appears

to be a boring activity. Yet having some bad experience people start to appreciate the knowledge of contract reading and composition.

The aim of this course is not to teach students to compose a contract, but to show on real life examples when you have to pay attention to details, which may affect your future job.

Governmental indifference in the employment protection is found as the biggest problem. The European Union countries policies include huge sanctions for employment rights offence. Latvian employment rights protection as well as society competence in labour legislation is very poor.

Although students consider employment legislation knowledge to be worthwhile, they think that without governmental and employers' participation nothing will change. While students are working, they don't get too many job supplies. That's why they are afraid to lose their job and continue to suffer from the employers' carelessness.

6. Future Directions

The course experience has brought some changes to the program. For the 2003–2004 year program the course consists only of lectures without practical hours. Some of the assignments have already been crossed with other courses. That's why this year the practical course has been cut.

Other changes are made in the course content. It is enlarged with the following topics:

- What is software as a product? Consumer protection.
- Cryptography and Privacy on the Internet.
- Computer crimes.

It is planned to pay more attention to the world legislation particularities and the differences between laws in various countries.

A new trend in the improvement of this course is pointed to be Ethics and Netiquette topics addition. These topics planned to provide knowledge of how to behave using the Internet, what is right, and what is wrong, what ought to be done, and what ought not to be done in the electronic communication (McFarland, 1990; Shea, 1994).

7. Conclusions

New technological progress influences many sides of our every day life – we started to operate with digital information copying, changing and deleting it in instant, we buy things in E-shops, we pay bills in E-banks, we read electronic books in E-libraries and so on. And like a common occurrence the new age has brought as much benefits as problems. The legal regulation of new processes couldn't stay unchanged, but through all these years has not reached its ideal.

The necessity of teaching IT legislation and ethics to Computer Science students is urged by many authorities in Computer Science education (Computing Curriculum, 2003;

SWEBOK, 2001). On the result of Phare program “Professional education” presented as a course abstract with the main aims and means of teaching the author has worked out a complete course material, including modified and enlarged study plan, study book, trial complex for testing and examination and the electronic space to ease the study process.

This course is being taught in three higher education programs in Computer Science in Latvia. Students acknowledge the course as interesting, topical and useful. They admit that the knowledge received during the study process can be used in every day life, gives the understanding of what is good and what is bad and helps to protect their own rights.

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Elektroninių ribojimų etika ir teisė

Darja ŠMITE

Naujieji elektroniniai ryšiai teikia ne tik privalumus, bet ir pareigas. Šiandieninės visuomenės kasdieniame gyvenime kompiuteriais naudojama taip, kaip dar niekada anksčiau. Turint omenyje tai, kad kibernetinės erdvės ribos nepaprastai plačios, jos reguliavimas tampa gana komplikuoatas. Daugeliu atveju, už savo saugumą atsako patys vartotojai. Tokioje situacijoje, elektroninės teisės išmanymas tampa vis labiau svarbus ir pravartus.

Be abejo, labiausiai igudę kompiuterių ir interneto vartotojai yra tie, kurie turi igiję informatiko kvalifikaciją. Daugelis informatikos mokymo autoritetų pabrėžia temų elektroninės visuomenės reguliavimo teisiniais aspektais svarbą. Keletas Latvijos universitetų nuo 2002–2003 mokslo metų į mokymo programą įtraukė naują kursą, vadinamą „Informacinių technologijų industrijos standartai, jas reglamentuojantys įstatymai, darbo apsauga bei ergonomika“. Kursas aktualus įvairiai auditorijai ir jis sėkmingai plėtojamas toliau.

Straipsnyje tyrinėjami su informacinėmis technologijomis susiję įstatymai bei etika, pristatoma pirmus metus skaityto kurso apžvalga, aptariamai pasiekti rezultatai.