

MAJOR AND MINOR KNOWLEDGE, BASIC AND OPTIONAL COURSES FOR STUDENTS IN THE PROGRAM ‘INFORMATICS’ IN NEW BULGARIAN UNIVERSITY

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Abstract: The university education in New Bulgarian University is discussed. The students have the advantage to choose optional courses, training courses. A teaching in the course of E-business is discussed.

Key words: education, computing, informatics, university courses.

1. INTRODUCTION

Education of Informatics Program students in New Bulgarian University (NBU) is based according the structure of the university and is dated since 1992. At present there are 3 Bachelors Programs and 2 Master Programs. The bachelor program is 8 semesters long. The students have the possibility to have optional courses and to choose major and minor specialization in their last 4 semesters of bachelor program. The structure of Master program is based according the bachelor student degree. In the current publication the attention is on the bachelor programs.

2. STRUCTURE OF THE BACHELOR DEGREE PROGRAM “INFORMATICS”

Learning at NBU follows the next types of courses:

- courses of general subject and specialized courses

- introducing and special courses
- compulsory and optional courses
- provided in lecture hall and out of lecture hall courses
- training courses

The forms of studying for students are:

- auditoria forms: lectures and workshops, training courses

These forms of studying are carried out in the lecture hall or computer lab. The number of students in a computer lab is limited to 15, according the number of computers. Every student has an access to a desktop computer, connected to a university LAN and with high speed Internet access. Additionally the area of the university has wireless Internet access. Some of the students prefer to use their own laptop.

- non-auditoria forms: self-organised by students (projects, seminars and internships), supervised by the lecturers.

The projects are organized that every student has a task to do for the semester. Depending on the subject area the task may be defined in a meeting with the lecturer, announced at the beginning of the semester or via Intranet of NBU. There are modules for e-learning where the lecturer may assign tasks, evaluate the results and communicate with each student, enrolled in that course.

Seminars are a form of studying that requires organization for presenting a topic. A preliminary announcement is done for the date of presentation. The students may take part with questions or other form.

On Table 1 (Assenova and Kirov, 2008) the number of courses is summarized according their type and accordingly the percent of all courses for the bachelor program of Informatics in NBU. It is obviously that the first four semesters the students have courses that are common for all students at NBU.

Table 1

Semester	Provided in lecture hall	Provided out of lecture hall	For knowledge	Bulgarian language	Sport/Arts	Training courses	Lectures in week
I	3,4%	4,5%	1,1%	1,1%	1,1%	1,1%	22
II	4,5%	4,5%	1,1%		1,1%	1,1%	22
III	6,8%	4,5%				1,1%	22
IV	6,8%	4,5%				1,1%	22
V	6,8%	4,5%				1,1%	22
VI	6,8%	4,5%				1,1%	22
VII	6,8%	4,5%				1,1%	22
VIII	6,8%	4,5%				1,1%	22
Total	48,7%	36%	2,2%	1,1%	2,2%	8,8%	

The next four semesters (3 and 4 study year) the students in Informatics Program continues in specialized modules – “Computer Science”, “Computer Programming”, “Applied Informatics”. Students must select one from two training courses that are out of lecture hall.

For students studying in other bachelor programs it is offered Minor Program in Informatics. This program includes 16 courses from the courses in the module “Applied Informatics”. Those way students at NBU from other programs can gain additional qualification in Informatics if his choice for minor program is informatics.

3. BASIC STUDY (1ST AND 2ND YEAR)

The first four semesters are introductory for all students studying Informatics. Like students in other programs at NBU they are studying basic courses including Bulgarian language skills, foreign language level, sports. The teaching includes else fundamental knowledge in Informatics - algorithms, programming and data structure, mathematics, computer architectures and networks, operation systems, information technologies (data bases, e-commerce), projects.

Main knowledge, skills and competences received in those semesters aims the students to understand the fundamental concepts, techniques and technologies; to be able to maintain and manage computer and electronic devices, systems and local and global networks; to apply programming languages for a variety of network applications and computer controlled devices like web technologies, multimedia, data bases and information systems, distributed and client -server systems; to know the rules of software engineering and to be able to apply them in practice; to know the technologies for network security and to be able to apply them practically; to have a basic knowledge on company ethics, management, marketing and risks in the IT industry; to be able to work in a team; to be initiative in obtaining continually new information in the process of the work.

4. SPECIALIZED EDUCATION OF STUDENTS IN 3 AND 4 ACADEMIC YEAR

For each of the study years the students have 60 credits and two non-credit training courses. All courses are optional during the third and fourth year of education (Manual for a candidate-student, 2007). The students have the choice to study one of tree modules - Computer Programming, Computer Science, Applied Informatics.

Module “**Computer Programming**” includes next courses of informatics:

Courses for programming skills: Graphical Programming, Network Programming, Programming with Microsoft Visual C#.NET, Modern functional programming, Programming with XML.

Courses for operational systems: Linux, UNIX.

Other courses: Relational data bases, Algorithms and data structures; Java web services

Training courses are carried out in computer labs in the university or out of the labs. Examples of training courses in labs are Computational algorithms, Probabilities and statistics – applied aspects, Languages for functional programming, Networked programming. Training courses out of the labs are in the form of projects. Examples of such projects are Project on C++, Project on Java, Project on Internet Technologies, Project on web design,

Module “**Computer Science**” includes next courses of informatics:

Courses for basic knowledge in informatics: Numerical Methods, Theory of probabilities, Algorithms and data structures, Math logic and logical programming, Applied statistics

Courses for programming skills: Graphical Programming, Network Programming with Java; Script languages for Internet (PHP).

Other courses: Relational data bases, UNIX, System administration of computer networks, Distributed and object-oriented data bases.

The training courses are same or similar like these in the previous module.

Module “**Applied Informatics**” includes courses of informatics:

Basic knowledge courses: Information security, Internet technologies, Distributed and object-oriented data bases, Script languages for Internet (PHP), System administration of computer networks, Software engineering, Information systems client-server, Algorithms and data structures, UNIX.

Courses for applied informatics: Automatization of accounting, Management Information systems, Information brokerage, GIS, Working with Corel, Publishing in Internet, Electronic business.

This module has training courses: Administration of computer networks with LINUX, Realization of software projects.

5. EXAMPLE – TEACHING E-BUSINESS TO THE STUDENTS OF PROGRAM MODULE “APPLIED INFORMATICS”

The modern environment has higher requirements to young educated. According to the requirements the students are asking for course to receive complex knowledge and skills. The course “Electronic business” discusses problems like brokerage in e-business, partnership with using IT, state laws and regulations connected with e-business, structure and strategy for e-business.

The employers are asking for specialists with skills and knowledge in the business.

Especially important is the communication between lecturer and students in class during teaching the course E-business. The communication may be at the form of discussion, or asking questions to and from students, or presentation.

Another important factor is the lecturer to present knowledge simple and with practical application. The course considers real examples from the business and the decisions are given after discussion. The goal is the students to learn the basic structure of building decision. They don't need to learn some applications which may not exist after a period of time.

Another important factor in the learning process is the feedback. My experience leads to the conclusion that it is important during the semester managers of companies with e-business to demonstrate their experience. This academic year the manager of ASBIS Bulgaria, IT Company, doing e-business B2B since 2001, made a presentation of their real case and the successful decisions. Such a presentation carries many advantages: the students are informed for a real application; they are informed for advantages or problems, connected with specific characteristics in the country; they ask questions about absolutely practical implications of e-business.

The course in e-business at NBU is carrying out according the standards of the university. Every student at the beginning of the semester has a case study with references. Usually the references are articles from the specialized magazines and newspapers from the current year or Internet addresses. Electronic databases with free access at NBU are useful too. The possibility the student to make his choice of case study from his real work is available. The feedback is provided from the seminar.

The course has no the goal to give programming skills or dealing with application software for e-business. Many organizations buy on-the-shelf software packages or subsystems. After the implementation of the solution they have service support and the programming tasks are not question of present interest for the staff. Students need knowledge for definition of the requirements to e-business software, advantages and disadvantages, clauses for a contract and for purchase software, types of service support.

5. CONCLUSIONS

University education on Informatics in a modern business environment should be different that before decades. The goal of acquiring basic knowledge on mathematics, statistics, programming skills retires into task-ground. The main goal is the graduated students to analyze organization, information and communication infrastructure, to build model for e-business for an organization, to define requirements for e-business application software, to choose software packages and services.

Important part of university education is the possibility to be proposed optional courses and training courses.

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