Faculty of International Economics and Administration
Department: Informatics
Professional area: Informatics and Computer Studies
Major: WEB DESIGN
Educational – and - qualification Degree: Master

COURSE DESCRIPTION

1. Course unit title: **Programming Structures of Data and Algorithms**
2. Course unit code: **INF 1071**
3. Type of course unit: adjustment
4. Level of course unit: Master
5. Year of study: first
6. Semester: adjustment
7. Number of ECTS credits allocated: 6
8. Name of lecturer: Assoc. Prof. Maria Bruseva, Phd
9. Learning outcomes of the course unit:

This course is a logical continuation of the courses "Programming" Part I', With the knowledge gained during the course students will be able to create individually programs for mathematical calculations, for program processing of the basic data structures – repetition and consolidation of the recursive types, as well as the dynamic data structures: linear and hierarchical, deep and wide searching, learning dynamic table structures, etc. They will be able to create programs using different groups of algorithms – recourse, arithmetic, sorting out massifs and files, processing series, some combinatory algorithms. It is necessary that this mass of knowledge is considerably consolidated in order to move on.

10. Mode of delivery: face-to-face
11. Prerequisites and co-requisites (knowledge and skills from previous training):

The basic training of the students should be provided by the subjects concerning use of computers, taught during the programming teaching courses in the Bachelor's degree..

12. Course contents:

The lectures present the modular approach to programming and also programming using C. Special attention is paid to the main data structures - recursive types and dynamic data structures : linear (linear list, stack, tail), hierarchical (binary trees, pyramids and tables), in-depth and wide searching, learning dynamic table structures (static, dynamic and index tables), etc. Particular attention is given to different groups of algorithms - recursion, arithmetic, sorting out massifs and files, string processing, some combinatory algorithms. The modeling possibilities of the studied tools and methods are reviewed and illustrated on the basis of the language C. The practical classes are carried out in the form of laboratory exercises. They aim at building specific practical habits and skills to work with the widely spread structure programming languages. During the process of learning the different data types and structures are given contextual examples – applications, accompanied by texts in relevant programs.

13. Recommended or required reading:

1.Павел Азълов, Фани Златарова, С ++ в примери, задачи и приложения, Просвета, 2011
2.Магдалина Тодорова, Структури от данни и програмиране на С++, Сиела, 2011
3.Магдалина Тодорова, Обектно-ориентирано програмиране на базата на езика С++, Сиела, 2011
4.Браян В. Керниган, Денис М. Ричи, Програмният език С, ЗеСТ Прес, София, 2008
5.Наков П, Добриков П., Програмиране = ++ Алгоритми, София, 2005

14. Planned learning activities and teaching methods:

Lectures (4 hours a week, 5 weeks)

Contact hours (conventional forms or conditions for individual contact hours) (1 hour a week, 15 weeks)
Laboratory work (5 hours a week, 2 weeks)
Methods of out-of-class-teaching (on-line contact hours – permanently during the semester)

Contact hours (conventional forms of conditions for individual contact hours) Individual contact hours

15Assessment methods and criteria:

Within the seminars students do two tests which are obligatory to be based on the language C. These tests check the level of the acquisition of new knowledge. The course ends with an exam where students have to show the theoretical knowledge and practical skills acquired in the process of training. To be admitted to take the exam, students have to successfully defend individual course assignment until the end of the semester. The course assignment includes developing a program, written in the C language, which is assessed after defense before the assistant professor and/or demonstrated before the group of students. The written part of the exam includes solving tasks and answering two questions from the set of questions

16. Languages of instruction: Bulgarian, Russian, English.
17. Work placement: practical laboratory work