

KHAZAR UNIVERSITY

**School of Architecture, Engineering and Applied
Sciences**

COURSE SYLLABUS

Data Structure and Algorithms

Data Structure and Algorithms

IDENTIFICATION:

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|---------------|--|
| Department: | Computer Science |
| Subject: | Data Structure and Algorithms (CMS 218) |
| Credit Units: | 4 |
| Instructor: | Aygun Alasgarova |
| Phone: | (+99412) 4975017 ext. 237 |
| E-mail: | a.alasgarova@mail.ru |
| Term: | Spring, 2010 |

PREREQUISITE: C Programming Language (CMS 204)

COURSE DESCRIPTION:

This is a computer science course that introduces the data structure and algorithms, the concept of an abstract data structure and the concept of an implementation, arrays- their implementation as well as their application, data aggregates and how they can be implemented in programming. The course will focus on structured programming techniques and their algorithmic counterparts.

OBJECTIVES:

- Use the techniques of data structure and algorithms.
- Introduce a new approach to problem solving methods and algorithm development.
- Learn algorithm design, compiling, debugging, testing, and documentation.
- Learn the concepts of Arrays, Queues and Lists, Trees, Sorting, Searching, Graphs and their applications.

TEXTBOOKS:

Core Textbook: Data Structures Using C++ by D.S. Malik. 2009

Supplementary Textbook: Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders. 2008

GRADING

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|----------------------------|-------------------|
| Midterm Exam | 30 points |
| Final Exam | 40 points |
| Class Participation | 10 points |
| Assignments | 20 points |
| TOTAL: | 100 points |

LEARNING AND TEACHING METHODS

This course considers active learning process where students are expected to intensively participate in discussions and brainstorming.

COURSE OUTLINE

| Weeks | Topics | Lecture Hours | Lab. Hours | Notes |
|--------------|---------------------------------------|----------------------|-------------------|--|
| 1 | Introduction to Data Structure | 4 | 2 | Chapter 1 in core text book Chapter 1 in Supplementary Textbook |
| 2 | Programming techniques and principles | 4 | 2 | Chapter 2 in core text book Chapter 1 in Supplementary Textbook |
| 3 | Program Reliability | 4 | 2 | Chapter 2 in core text book |
| 4 | The Stack | 4 | 2 | Chapter 3 in core text book Chapter 2 in Supplementary Textbook |
| 5 | Queues and Lists | 4 | 2 | Chapter 4 in core text book Chapter 2 in Supplementary Textbook |
| 6 | Recursion | 4 | 2 | Chapter 5 in core text book |
| 7 | Information Retrieval | 4 | 2 | Chapter 3 in Supplementary Textbook |
| 8 | Midterm Exam | | | |
| 9 | Trees | 4 | 2 | Chapter 6 in core text book |

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|----|-----------------------------------|---|---|-------------------------------------|
| 10 | Binary Trees | 4 | 2 | Chapter 5 in Supplementary Textbook |
| 11 | Graphs and applications | 4 | 2 | Chapter 7 in core text book |
| 12 | Sorting | 4 | 2 | Chapter 8 in core text book |
| 13 | Searching | 4 | 2 | Chapter 9 in core text book |
| 14 | Data Structuring and organization | 4 | 2 | Chapter 6 in Supplementary Textbook |
| 15 | Mathematical methods | 4 | 2 | Chapter 9 in Supplementary Textbook |
| 16 | Case Study | 4 | 2 | Chapter 9 in Supplementary Textbook |
| | Final Exam | | | |