International Ataturk Alatoo University

Международный Университет «Ататюрк-Алатоо»

Confirmed by / Утверждено
Head of Department / Зав. Кафедрой

_____   _____

Last Name, First Name / Ф. И.   Signature (подпись)

"___" _____ 201__

SYLLABUS / РАБОЧАЯ ПРОГРАММА

Course Title / Название предмета   Data Structires I_____

Department / Кафедра   Computer Engineering 2013 - 2014 academic year

Faculty / Факультет   New Technologies _____

Semester	Course		Credits	Lectures (weeks)
Семестр __fall__	Курс	__3__	Зачет __4__	Лекции (недель) _60(15)____
Examinations	Assignment(s)		Research Projects / Practical Work	
Экзамены __2__	Индивидуальная Работа _9_		Курсовые Работы / Практические Занятия	_12____

The Syllabus is based upon the educational standard
Рабочая программа составлена на оснавании стандарта образования

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"___" _____ 201__   (signature) / подпись _____

APPROVED at the Department Session
РАСМОТРЕННО на Заседании кафедры

Order / Приказ № _____ "____" _____ 201 ___ year

Syllabus (Программа)

COURSE TITLE / Название предмета:

Data Structures I

1. COURSE DESCRIPTION / Описание предмета:

The design, implementation and run-time analysis of important data structures and algorithms. The data structures considered include sorted arrays, linked lists and stacks, queues. An approach based on abstract data types and classes will be emphasized. The use of recursion for algorithm design. Class design and implementation in JAVA. Programming assignments JAVA.

 Students acquire an in-depth knowledge of computer programming. In particular, students construct correct, well-documented programs using files, linked lists, stacks, queues, sorting and searching techniques.

2. AIMS & OBJECTIVES / Цели и задачи:

This course is the foundation course for the student of computer engineering. The object is data expressing and processing. All students will learn the basic concept about ADT, and learn some space and time analysis method. This course need student practices their ability about programming and algorithm developing and trains the ability about logic abstract.

   The main task about this course is about all kinds of data structure, memory structure and some operation. Teaching student how to develop the data structure around the concept of an abstract data type (ADT).

1.   Students will be knowledgeable of fundamentals of data structures and methods of implementation.

2.   Students will manage and analyze of a complex problem by designing a proper solution method and coding it in a programming language such as JAVA.

3.   Students will develop object-oriented codes and perform software life cycle.

4.   Students will work with various sorting and searching techniques

5.   Students will perform basic operations on files, strings, queues, stacks, linked lists etc.

3. BY THE END OF THIS COURSE STUDENT WILL BE ABLE TO (К КОНЦУ этого курса студенты смогут):

- ✓ Graduates will demonstrate proficiency in developing logically sound and efficient algorithms.
- ✓ Students will demonstrate through understanding of the software development life cycle. Students will be able to evaluate and choose among alternative system solution strategies.
- ✓ Students will be knowledgeable of the concepts and techniques of computation. Students will be able to apply computational techniques in analyzing algorithms.
- ✓ Graduates will demonstrate the ability to implement algorithms in various programming languages.

4. GRADING / Оценка:

1 Quiz	15% of Midterm
1 Project	15% of Midterm
Homework	10% of Midterm
1 Quiz	15% of Final
1 Project	15% of Final
Homework	10% of Final
Midterm Exam	40% of Final Grade
Final Exam	60% of Final Grade

5. LITERATURE / литература:

Course book: Sams Publishing Data Structures and Algorithms in Java. (2nd.Edition).

Additional Books:

Internet Resources: http://www.javatutorialhub.com/first-java-program.html

Note: Literature from our library should be also included

6. ATTENDANCE / посещаемость:

(Policy description)

The attendance policy of this class will follow the policy of the University.

7. CONTENT & COURSE CALENDAR / СОДЕРЖАНИЕ И КАЛЕНДАРЬ курса:

The calendar below provides information on the course's lecture (L), recitation (R) sessions and quizzes.

Week #	SES #	Course calendar.		
		TOPICS	Reading(Chapter)	KEY DATES
		Introduction and Review		
1	L1	Syllabus, Introduction to Data structures	Reading 1	
	R1	Data Structures, Real-World Data Storage		
		Arrays		
2	L2	The Basics of Arrays in Java, Creating an Array, Accessing Array Elements	Reading 2	HW 1 out
	R2	Arrays		
3	L3	Arrays: Deeper Look. Insertion, Searching, Deletion, The Duplicates Issue	Reading 2	HW 1 due
	R3	Arrays examples		HW 2 out
		Sorting Algorithms		
4	L4	Simple Sorting (Bubble Sort, Selection Sort)	Reading 3	HW 2 due
	R4	Principles of Sorting		HW 3 out
5	L5	Insertion Sort	Reading 3	HW 3 due
	R5	Sorting Algorithms		HW 4 out
		Stacks and Queues		
6	L6	Stacks	Reading 4	HW 4 due
	R6	Stacks appliance		
7	L7	Quiz - 1 (duration 1 hour, 4-5 Questions)		
	R4	Solving Quiz Questions		
8	L8	Queues, Priority Queues	Reading 4	HW 5 out
	R8	Stacks and Queues		HW 5 due
		MIDTERM		
		Linked Lists		
9	L9	Links, A Simple Linked List	Reading 5	HW 6 out
	R5	Arrays, Lists		
10	L10	Double-Ended Lists. Finding and Deleting Specified Links	Reading 5	HW 6 due
	R10	Linked Lists		HW 7 out
11	L11	Doubly Linked Lists, Iterators	Reading 5	HW 7 due

	R6	Iteration		
12	L12	Quiz - 2 (duration 1.2 hour, 5 Questions)		
	R12	Quiz 2 Questions and Computability Wrap-up		
13	L13	Stacks and Queues with Linked Lists	Reading 5	HW 8 out
	R13	Algorithm Structuring		
14	L14	Recursion. A Recursive Binary Search, Factorials	Reading 6	Hw 8 due
	R14	Recursion		HW 9 out
15	L15	Overall Review		HW 9 due
	R15	Summary		
FINAL EXAM				