МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ КЫРГЫЗСКОЙ РЕСПУБЛИКИ

International Ataturk Alatoo University

Международный Университет «Ататюрк-Алатоо»

Confirmed by / Утвер: Head of Department					
Last Name, First Nar	ne / Ф. И.	Sign	aature (подпись)		
	201				
S	SYLLAB	US / РАБОЧА	Я ПРОГР.	AMMA	
Course Title / Назва	ние предмета	Data Structires I			
Department / Кафед	pa	Computer Engineering	g 2013 - 2014 aca	demic year	
Faculty / Факультет		New Technologies _			
Semester Семестр	Cou _fall Kypc		Credits Зачет <u>4</u>	Lectures (weeks) Лекции (недель) <u>60(15)</u>	
Examinations	s Assi	ignment(s)	Research Proje	ects / Practical Work	
Экзамены	<u>2</u> Инди	видуальная Работа <u>9</u>	Курсовые Работь	л / Практические Занятия	_12
The Syllabus is based Рабочая программа соста	•	cational standard ии стандарта образования			
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Author Составитель		ast Name, First Name, Рамилия, Имя, Отчество)			
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		Order / При	каз №"_	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.

Harmonia SES Harmonia TOPICS Reading(Chapter) DATES	Week	Course calendar.					
1		SES#	TOPICS	Reading(Chapter)			
R1 Data Structures, Real-World Data Storage Arrays L2 The Basics of Arrays in Java, Creating an Array, Accessing Array Elements R2 Arrays L3 Arrays: Deeper Look. Insertion, Searching, Deletion, The Duplicates Issue Reading 2 HW 1 out R3 Arrays examples Sorting Algorithms L4 Simple Sorting (Bubble Sort, Selection Sort) R4 Principles of Sorting R5 Sorting Algorithms R6 Stacks and Queues R7 L7 Quiz - 1 (duration 1 hour, 4-5 Questions) R8 R8 Stacks and Queues MIDTERM Linked Lists L10 Double-Ended Lists. Finding and Deleting Specified Links R6 Reading 5 HW 6 out R7 Arrays, Lists L10 Double-Ended Lists. Finding and Deleting Specified Links R6 Reading 5 HW 6 out R7 Arrays, Lists R8 Reading 5 HW 6 out R8 AFRAYS, Lists R8 AFR							
Arrays 2 L2 Accessing Array Elements Accessing Array Elements Reading 2 3 L3 Arrays: Deeper Look. Insertion, Searching, Deletion, The Duplicates Issue Reading 2 4 L4 Simple Sorting (Bubble Sort, Selection Sort) 5 L5 Insertion Sort Reading 3 HW 2 out 8 Sorting Algorithms 1 L5 Insertion Sort Reading 3 HW 3 out B HW 3 out B HW 3 out B HW 3 out B HW 4 out B HW 3 out B HW 4 out B HW 5 out B HW 5 out B HW 6 Out B HW 7 out B HW 8 out B HW 9 out B HW 9 out B HW 1 out B HW 1 out B HW 1 out B HW 2 out B HW 2 out B HW 3 out B HW 4 out B HW 5 out B HW 6 out B HW 7 out B HW 8 out B HW 9 out B HW 9 out B HW 9 out B HW 9 out	1	L1	Syllabus, Introduction to Data structures	Reading 1			
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		R10	Linked Lists				
Doubly Linked Lists, Iterators Reading 5 due	11	L11	Doubly Linked Lists, Iterators	Reading 5	HW 7 due		

	R6	Iteration		
12	L12	Quiz - 2 (duration 1.2 hour, 5 Questions)		
R12	R12	Quiz 2 Questions and Computability Wrap-up		
13	L13	Stacks and Queues with Linked Lists	Reading 5	HW 8 out
R13	R13	Algorithm Structuring		
14	L14	Recursion. A Recursive Binary Search, Factorials	Reading 6	Hw 8 due
R14	R14	Recursion		HW 9 out
15 L15	115	Overall Review		HW 9
				due
R15		Summary		

FINAL EXAM