SITE 1101: Principles of Information Systems

Basic Information

- **ADA University, Fall Semester, 2022**
- **SITE 1101: Principles of Information Systems (6 credits[1])**
- **Course meeting times and location:** Joined lecture: Mondays, 08:30-09:45, Room (online and D 107)
  Separate meetings: Tuesdays, 08:30-09:45 (Room D 107) and 11:30-12:45 (Room D 109) / Wednesdays 08:30-09:45 (Room D 208) / Thursdays, 10:00-11:15 (Room D 109) and 11:30-12:45 (Room D 208)
- **Instructor(s):** Araz Yusubov (PhD in Information Processing and Control Systems), Room B 311
  Malak Gasimova (MS in Management and Information Systems), Room B 317
- **How to contact instructor**
  - In-person office hours: **Students are expected to actively use the course discussion forum for asking their questions.** Instructors will post the schedule of face-to-face video-meetings if necessary.
  - E-mail addresses: ayusubov@ada.edu.az / mgasimova@ada.edu.az
  - Preferred mode of communication: **Course discussion forum**
  - Optional: **drop us an email anytime so we agree on a meeting**
- **Course website URL:**
  https://ada.blackboard.com/webapps/blackboard/execute/modulepage/view?course_id=_8724_1&cmp_tab_id=_26275_1
  Students are expected to check the course webpage(s) regularly for getting timely updates.

Course Description

- **Prerequisites:** Prior courses: None
- **Technology requirements:**
  - Equipment: Students are to use their **laptops** to implement the class assignments and join online class sessions.
  - Software: **Microsoft® Office** suit (mainly Excel, Word and PowerPoint) or any other compatible product; **Respondus® LockDown Browser** and **Monitor**[2], the approved online proctoring tool.

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[1] At ADA University, 1 credit corresponds to 30 hours of work in a usual semester (2 hours in a week). **6 credits = 2.5 hours class time + 9.5 hours student preparation time per week**. Workload is an estimation of the time an individual typically needs to complete all learning activities such as lectures, seminars, projects, practical work, internship, and individual study required to achieve the defined learning outcomes in formal learning environments.

- Additional requirements may be provided by the instructor during the classes.
- **Overview of course (as stated in the program catalogue):**
  This course provides freshmen students with the basic understanding of their major. Through class projects it introduces the concepts of information technology (IT) and different components of computer-based information systems: hardware, software, networks (with additional emphasis on the Internet and web) and databases, as well as engineering approach to system analysis and design.
- **Student learning objectives (as stated in the program catalogue):**
  - Students will obtain understanding of the field and an awareness of the various directions, which would increase understanding of their selected specialty. Concepts will be reinforced with industry case studies, course assignments and hands-on practice. Additional objectives include learning about the importance of information systems in the success of organizations, the role IT specialists play in our modern society and ethical challenges posed by technology.
- **Methods of instruction:** The class will be taught through lectures, including discussion around case studies and course assignments. Discussions based on student contributions add a vital and dynamic element to the class. Students are expected to come to the class with comments or questions from the course readings.
- **Workload:** It is estimated that the students will need to spend 5-6 hours of study and preparation for the classes every week. Estimated amount of time to spend on course homework is additional 4-5 hours per week.

Materials

- **Primary or required books/ readings for the course:**
  - Ralph Stair and George Reynolds, *Principles of Information Systems*,
    12th Edition / Course Technology © 2015 (752 pages) ISBN: 978-1285867168
    13th Edition / Cengage Learning © 2018 (690 pages) ISBN: 978-1305971776
- **Supplemental or optional books/readings:**
  - David D. Riley and Kenny A. Hunt, *Computational Thinking for the Modern Problem Solver* / Chapman & Hall/CRC © 2014 (379 pages) ISBN: 978-1466587779
  - Ron White, *How Computers Work: The Evolution of Technology*, 10th Edition / © 2014 (361 pages) ISBN: 978-0789749840
  - Additional readings may be assigned or provided by the instructor during the classes.

Requirements

- **Exams and quizzes:** Students will take 2 exams (midterm and final). These will be closed book tests consisting of multiple-choice, fill-in-the-blank and open-ended essay questions. The Midterm exam is planned for **4 Nov 2022** and the Final exam is planned for **29 Dec 2022** (time

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[2] Solutions for Higher Ed – Respondus https://web.respondus.com/he/

and place will be communicated during the term).
- Weekly **self-check quizzes** (participation activity) are for students to take after the class sessions to check how well they learned the material. Each one is an individual non-graded quiz with limited 3 attempts. Hence, the suggestion is to not mechanically retake the quiz until you get all answers right, rather to focus on your mistakes and make sure you go through the corresponding material or ask relevant questions in the "Questions" forum. Students **unlock the next week** material only if they score at least 50% in the self-check quiz for this week. You get nice medals for higher scores and a special award for getting gold medal first.
● **Assignment/problem sets/projects/reports/research papers:** Homework(s) in a form of either an analytic essay or practical work report, approximately around 1,500-2,000 words in length will be assigned. Teams of 4±1 students will be formed as required. Homework(s) in a form of week-long written team assignments will be given during the semester. Detailed information and the exact date will be communicated during the term.
The students will submit the homework assignment online and in hard copy (as required). The homework(s) will be graded based on clarity, technical soundness, thoroughness and coverage, relevance and utilization of resources. Presentation(s) will be graded based on quality of content and delivery, level of participation, organization and design knowledge.
● **Other requirements:** No other requirements.

Policies

● **Grading procedures:**
- The students will be graded on an absolute scale.
- The course grade will be calculated from the following components:

Attendance – 5%	Participation – 10%	Homework(s) – 40%	Midterm exam – 20%	Final exam – 25%

- Students, who contend that their grade is not an accurate reflection of their accomplishments in the class, should first discuss their grade assessment with the instructor. For further steps please refer to the university procedures.
● **Attendance and tardiness:** Attendance is an indispensable element of the educational process. In compliance with Azerbaijani legislation, instructors are required to monitor attendance and inform the Student Records and the Dean of the respective School when students miss significant amounts of class time. Azerbaijani legislation mandates that students who fail to attend at least 75% of classes will fail the course.
- Starting from the 2nd week of the semester (right after the last day of the Add/Drop period on **21 Sep 2022**) **attendance** will be checked 10 minutes after the start time of each class. Thus the students have extra time to make it to the classroom in order to be marked as 'present'. Otherwise they will be marked as 'late', and after 20 minutes they will be marked as 'absent'. They also are required to be present 70% of the class. **The students who do not react to participation call will be marked as 'absent'.** There is NOT a policy allowing "two unexcused absences" as a similar policy was officially discontinued starting Fall Semester in 2015.
● **Class participation:** Students are encouraged to **contribute to class discussion**. Certain percent of the course grade will depend upon contributions to class sessions and **online discussions**, as well as **other participation activities**. Class participation provides the opportunity to practice speaking and persuasive skills, as well as the ability to listen. What matters is the quality of one's contributions, not

the number of times one speaks.
- **Classroom decorum:** To avoid distractions **late students** are asked not to enter the class after the doors are closed. **Cell phones** shall be placed on silent mode, and shall not be used in the classroom during class sessions. As an exception, students may leave or enter the room with the instructor's permission. For more information please read the Student Code of Conduct
- **Missed or late assignments/extensions:** No missed assignments will be accepted later.
- **Standards for academic honesty and penalties for infractions:** If a student found guilty of academic dishonesty for the first time after the "Forgiveness Period", he or she would fail the course. If the case of repeated violations, the student will be suspended or permanently expelled. For more information please read the Honor Code.

Schedule

- **Last day to withdraw from the course:** 19 Nov 2022
- **Tentative calendar of topics and readings:** The course is organized in four major parts:
  1.Overview, 2.Information Technology Concepts, 3.Information Systems in Organizations, 4.Systems Development.

	Week of	Theme	Topics	Learning Outcomes	Reading
1.	12 Sep	PART 1 Overview: An Introduction to Information Systems / Technology	Information Concepts / System Concepts / What is an Information System? / What is Engineering approach and Technology?	● Define and differentiate between **data** and **information** ● Define **system**, describe **its components** and their interaction ● Describe **information system** (IS) and components of a **computer-based IS**	Stair 1
2.	19 Sep	PART 2 Information Technology Concepts: Hardware	Hardware: Anatomy of a Computer / Central Processing Unit Binary (hexadecimal) representation / Converting between representations / Operations on binary numbers	● Describe the main principles of the **von Neumann architecture** ● Describe the components of the **central processing unit** (CPU) and how they work together ● Describe different **processing characteristics** and **physical characteristics** of the CPU ● Define **bit** as the smallest unit of data in digital systems, as well as **byte and larger** units ● Describe the **binary/hexadecimal representation** of positive integer numbers ● Convert positive integers **from decimal to binary** and **vice-versa** ● Convert positive integers **from decimal to hexadecimal** and **vice-versa**	Stair 3 Riley 1.1-1.9 Riley 2.1-2.6 White 3
3.	26 Sep	Hardware / **Homework 1**	Hardware: Input, Processing, and Output Devices / Memory storage devices	● Describe and differentiate various **types of memory devices** e.g. ROM, RAM, cache memory ● Describe and differentiate between **DRAM and SRAM technologies**	Stair 3 Riley 3 White 2-4

			Operations on binary numbers / Arithmetic operations and logical operations	• Explain and contrast **two access methods** in storage devices • Describe and differentiate between different **technologies used in secondary storage** devices • Describe and compare **basic logical operations** i.e. NOT, AND, OR, XOR • Explain **addition of two binary numbers**, (positive integers) • Explain **subtraction of two binary numbers** (positive integers) and the use of two's complement	
4.	3 Oct	Software: Systems and Application Software	An Overview of Software / Systems and Application Software / Algorithmic Foundations Algorithmic concepts / Boolean logic / Boolean operations / Conditions and loops / Introduction to programming with Code.org	• Define **software** and **algorithm** • Differentiate between **systems** software and **applications software** • Describe functions and **types of application software** • Describe functions and **types of systems software** • Explain the role and activities of **operating system** (OS) • Describe the five **properties of algorithm** • Explain different **types of algorithmic actions** i.e. name binding, selection	Stair 4 Riley 5 White 5
5.	10 Oct	Software: Systems and Application Software	Programming Languages / Software Issues and Trends Review of all Algorithmic Concepts	• Explain advantages and disadvantages of **proprietary** and **off-the-shelf** software • Define **programming language**, differentiate between **semantics** and **syntax** • Explain evolution of **programming language generations** and basic **paradigms** • Differentiate between **compiler** and **interpreter** • Explain different **types of algorithmic actions** i.e. repetition, modularization, recursion	Stair 4 Riley 5-6 White 5
6.	17 Oct	Database Systems and Business Intelligence / **Homework 2**	Data Management / Data Modeling and Database Characteristics Sorting and Searching Algorithms	• Explain **database approach** and its advantages over the traditional one • Define **data model** and identify **entities** within the problem domain • Describe **ER (entity-relationship) diagrams** and their components • Differentiate among various **types of relationships** in ER diagrams • Explain **relational database model** and compare with other models • Describe different types of **data manipulation**, i.e. selection, projection, joining, and linking • Explain **database index** and advantages of its use	Stair 5 White 6.2-4 Riley 3.3.4
7.	24 Oct	Database Systems	Database Management Systems / Database Applications	• Explain database **transactions** and **ACID** properties • Describe **SQL** and its main commands	Stair 5

				● Explain **NoSQL database** model and contrast it with relational database model	White 6.2-4
		and Business Intelligence	Sorting and Searching Algorithms	● Describe main **DBMS (database management system) activities**, e.g. data definition, data manipulation and concurrency control ● Define **Big Data** and describe its main characteristics, challenges and opportunities ● Explain knowledge discovery in data process, **business intelligence** and its technologies	
8.	31 Oct	Telecommunications and Networks	An Overview of Telecommunications / Networks and Distributed Processing / Telecommunications Services and Network Applications	● Describe the **general model of telecommunications** and its elements ● Describe classifications of **communication**, telecommunications **channel** and **networks**, explain their main characteristics ● Compare different **types of wired and wireless telecommunication media**, explain their characteristics ● Describe **computer network**, its basic **hardware** components and **processing** alternatives ● Explain various **network types** and compare most common **network topologies**	Stair 6 White 17
	4 Nov	**Midterm exam**			Stair 1-6
9.	7 Nov	The Internet, Web, Intranets, and Extranets / **Homework 3**	Use and Functioning of the Internet / The World Wide Web / Internet and Web Applications	● Define the **Internet** and describe its hierarchical structure ● Explain the general principle of the OSI (Open System Interconnection) **model of networking systems** and its layers ● Describe the characteristics of the **Internet protocol suite** ● Explain the **IP address**, its various classifications and usage ● Describe the **DNS (domain name system)** and its structure	Stair 7 White 18-20
10.	14 Nov	The Internet, Web, Intranets, and Extranets	Use and Functioning of the Internet / The World Wide Web / Internet and Web Applications	● Define the **World Wide Web** and describe its structure and components ● Describe the characteristics of the **hypertext transfer protocol** ● Explain the **uniform resource locator**, its structure and usage ● Describe various **markup languages**, their structure and usage ● Define **intranet** and **extranet**, their characteristics ● Explain the **cloud computing**, its various classifications and usage	Stair 7 White 18-20
11.	21 Nov	PART 3 Information Systems in Organizations Business Information Systems: Electronic Commerce	Organizations and Information Systems / Competitive Advantage / Performance-Based Information Systems / Careers in Information Systems An Introduction to Electronic Commerce / Electronic Commerce	● Define **organization** and describe the value chain model ● Explain the **role of information systems** (IS) in value-added processes ● Describe **organizational structure** and its various types ● Explain **organizational culture**, different models of introducing and managing **change** ● Define **e-commerce**, its multistage model, and **e-government**, their different forms	Stair 2 Stair 8

			Applications / Strategies for Successful E-Commerce / Cyber Security	● Describe **successful model** for e-commerce, its basic components and trust-building strategies	
12.	28 Nov	Enterprise Systems / Information and Decision Support Systems Knowledge Management and Specialized Information Systems / **Homework 4**	An Overview of Enterprise Systems / Transaction Processing Activities / Enterprise Resource Planning, Supply Chain Management, and Customer Relationship Management / Decision Making and Problem Solving Management Information Systems / Decision Support Systems / Knowledge Management Systems / Artificial Intelligence / Virtual Reality / Other Specialized Systems	● Describe **TPS (transaction processing system)** and its functions ● Distinguish between two different **transaction processing methods** ● Describe **ERP (enterprise resource planning)** system and its functions ● Distinguish the stages of **decision-making** and **problem solving** ● Explain different classifications of **decisions** and types of **decision making** approaches ● Distinguish between **MIS (management information system)** and **DSS (decision support system)**, their functions ● Describe **KMS (knowledge management system)** and its functions ● Define **artificial intelligence** (AI), explain the **Turing test** and characteristics of **intelligent behavior** ● Describe **AI systems**, their major types and functions	Stair 9-10 Stair 10-11
13.	5 Dec	PART 4 Systems Development: Investigation and Analysis	Systems Development Life Cycles / Factors Affecting Systems Development Success / Systems Investigation / Systems Analysis	● Identify the **key participants** in the systems development process and explain their roles ● Describe the traditional **systems development life cycle** (SDLC), its advantages and disadvantages ● Identify the steps of **systems investigation**, describe its main outputs ● Describe the steps of **systems analysis**, identify main outputs of this phase ● Identify the steps of **systems design**, describe main outputs of this phase ● Describe **main tools and techniques** used in different phases of the SDLC	Stair 12 Riley 4
14.	12 Dec	Systems Development: Design, Implementation, Maintenance, and Review	Systems Design / Systems Implementation / Systems Operation and Maintenance / Systems Review	● Describe the primary activities associated with **systems construction** ● Identify the steps of **systems integration and testing**, describe main **types of testing** ● Describe the steps of **systems implementation**, distinguish between different **cutover strategies** ● Identify the steps involved in **systems operation**, **maintenance** and **disposal** ● Describe **prototyping** approach, different types of prototypes ● Explain **agile development**, its advantages and disadvantages	Stair 13

15.	19 Dec	The Personal and Social Impact of Computers	Engineering Ethics and Social Responsibility / Computer Waste and Mistakes / Computer Crime / Privacy Issues / The Work Environment / Ethical Issues in Information Systems	• Explain **responsibilities and ethics** associated with engineering profession • Outline the ACM **Code of Ethics** and Professional Conduct • Describe important **social issues** related to usage, development and management of information systems	Stair 14 Riley 12
	29 Dec	**Final exam**			Stair 1-14

Resources

- **Support services on campus:**
  - Students are encouraged to consult with the Writing Center for checking their papers and assignments. Please visit the **Writing Center** or contact them by email: writingcenter@ada.edu.az
  - Adjusting to student life, pursuing academic and personal goals can be emotionally stressful and challenging. Students are encouraged to make individual appointments with a Counselor to receive professional psychological support. Please contact **Turana Aliyeva**, Instructor at the School of Education at phone: (012) 4373235 x297 or by email: taliyeva@ada.edu.az.
- **Tips for success**
  - This is a reading-heavy class. Students will need to read the course readings throughout the semester to learn the material and to be able to contribute to class discussions.
  - Here are some words of wisdom from *Dr. Morgan Liu* of The Ohio State University on "How to Read an Academic Book or Article": Reading an academic article/book is not like reading a newspaper or novel. Following these guidelines will help keep you from being overwhelmed, and make you better prepared for discussions & essays.
    1. Read actively, not passively. You read because you are trying to mine the text for insights. You are not reading because you have to get through it. Take an active posture while reading: you are trying to take something away from the reading.
    2. Before you begin, ask yourself: what is my purpose for reading this? First ask yourself: What topic is the course covering this week? What are the active issues and recurrent themes? What sorts of insights do I hope to get out of the reading? The Reading Questions will help you get a grip.
    3. Do not always read from start to finish. Read the introduction or opening paragraphs. Then skip to the back and read the conclusion to see where the thing is going. Flip through the article/book and take note of the section or chapter titles. Read the beginning & end of each section to see what they're about. Stop. Think about what this article/book is trying to accomplish and how it will get there. Get a sense of the overall arguments first, and how the author will develop them. Then step back, close your eyes and think, what are the most important parts that I must read? What can I skim over for now?
    4. Read selectively. Do not read every word in the text. Read the most important parts first, and see what else you need to read as you go. You can always go back. You have my permission to skip the less important parts – no guilt, really!! But you have to be thoughtful to figure what those are. Better to read the most important parts thoughtfully, than try to get through the entire thing like a zombie.
    5. Stop frequently and ask yourself: what did I just learn? Make notes as you go. Write down questions. Don't get bogged down in unimportant detail.

If your mind starts to wander, stop and refocus on the big picture: what's been happening in the text, and where it is.

Statement on Accommodation

- ADA University provides upon request appropriate academic accommodations for qualified students with documented disabilities. Any student who feels she/he may need an accommodation based on the impact of a disability should notify the Office of Disability Services and Inclusive Education about his/her needs before the start of the academic term. Please contact **Office of Student Services** at phone: (012) 4373235 x226 or by email: studentservices@ada.edu.az
- Reasonable accommodation is possible for students' religious beliefs, observations, and practices or for foreseeable conflicts because of athletic competition

Disclaimer

- **The course schedule is subject to change as necessary**
  - Revision 0 Initial version (posted on 9 September 2022)