NYU SCHOOL OF PROFESSIONAL STUDIES

Systems Development & Analysis

MASY1-GC 3210 | 200 | Spring 2024 | 01/22/2024 - 05/06/2024 | 3 Credit
Modality: Online(Synchronous)
Course Site URL: https://brightspace.nyu.edu/

General Course Information

Name/Title: Sam Sultan, Adjunct Assistant Professor Mr.
NYU Email: sam.sultan@nyu.edu
Class Meeting Schedule: 01/22/2024 - 05/06/2023 | Mondays | 02:00pm -- 04:35pm
Class Location: Online(Sy)
Office Hours: Mondays, 1:00pm-2:00pm EST, onsite. Email for an appointment.

Description

This course investigates the concepts and techniques used in the analysis and design of business information systems. Students learn to assess business requirements, use interviewing and testing techniques, determine the feasibility of software products, and estimate system development costs. They design data flow diagrams, data models, file designs, interface designs, and software designs. The course introduces students to key elements of the system development lifecycle (SDLC) applied to system analysis and design. They learn how to select, plan, analyze, design, implement, and maintain modern information systems and create business systems analysis and design documents to communicate with system stakeholders.

Prerequisites

1240 - Information Technology and Data Analytics

Learning Outcomes

At the conclusion of this course, students will be able to:

- Select an appropriate system development methodology
- Analyze the business case to select the most value-added project to implement
- Evaluate project financial feasibilities including NPV, ROI and break-even
- Create a Work Breakdown Structure to develop the system
- Perform Requirement Gathering and document the Requirements Specification
- Conduct logical and physical data modeling, applying data normalization rules

Communication Methods

Be sure to turn on your NYU Brightspace notifications and frequently check the "Announcements" section of the course site. This will be the primary method I use to communicate information critical to your success in the course. To contact me, send me an email. I will respond within 24 hours (48 during weekends).

Credit students must use their NYU email to communicate. Non-degree students do not have NYU email addresses. Brightspace course mail supports student privacy and FERPA

guidelines. The instructor will use the NYU email address to communicate with students. All email inquiries will be answered within 24 hours. (48 during weekends)

Structure | Method | Modality
There are 14 sessions during this course. The session topics are organized into 1) Concepts, 2) Learning Principles, and 3) Methodologies.

During this course, there will be assignments, midterm exam, final exam, and a final team project. For the final team project, students will be divided into groups of 2 to 4 students. Engagement during class presentations is a must and will result in better overall grade. Important announcements, and all assignments and exam submissions will be done through the course site in NYU Brightspace.

Expectations

Learning Environment
As graduate students, you are expected to conduct themselves in a professional manner and engage and collaborate with your classmates. Classrooms are diverse and include students who range in age, culture, learning styles, and levels of professional experience. To maintain an inclusive environment that ensures all students can equally participate with and learn from each other, as well as receive feedback and instruction from faculty during group discussions in the classroom, all course-based discussions and group projects should occur in a language that is professional and shared among all participants.

Participation
To receive full credit for class participation, you should attend all classes since much of the learning and engagement occurs during class lecture, presentation and class discussions. You must contribute and engage in class discussions/dialogue during every class session of the course. Please contact the instructor if you anticipate missing any part of the class. Please arrive on time so as not to disturb the flow of the lecture. Excessive lateness's may result in lower overall grade.
Please contact the instructor if you anticipate missing any part of the class. Participation grades will be based on:

- Involvement in class discussions, dialogues, and activities during each session
- You must ask at least one question and response to professor or other student inquiry at least one (or multiple times) per each session.
- Participation which demonstrates integration of reading, class work, and relevance application.
- Quality/quantity of providing effective and balanced feedback.

Assignments and Deadlines
Students are expected to participate in each class session by offering their understanding of the subject, sharing ideas or discussing/commenting on other student's comments. In addition, students must complete and submit all assigned homework on time. Assignments are typically due within one week of assigned date (unless specifically mentioned to the contrary). Late submission of homework will either not be accepted, or will result in a lower

grade. Students are also expected to develop with and present a team project with other students (instructor will assign), as well as take and pass a midterm exam and a final exam.

Course Technology Use
We will utilize multiple technologies to achieve the course goals. I expect you to use technology in ways that enhance the learning environment for all students. All class sessions will require the use either the lab room desktop computers or your own personal laptop computer. You can use either a PC or a MAC based computer.

Feedback and Viewing Grades
I will provide timely meaningful feedback on all your work via our course site in NYU Brightspace. You can access your grades on the course site Gradebook.

Attendance
I expect you to attend all class sessions. Attendance will be taken into consideration when determining your final grade.

Excused absences are granted in cases of documented serious illness, family emergency, religious observance, or civic obligation. In the case of religious observance or civic obligation, this should be reported in advance. Unexcused absences from sessions may have a negative impact on a student's final grade. Students are responsible for assignments given during any absence.

Each unexcused absence or being late may result in a student's grade being lowered by a fraction of a grade. A student who has three unexcused absences may earn a Fail grade.

Refer to the SPS Policies and Procedures page for additional information about attendance.

Textbooks and Course Materials

Systems Analysis and Design – 12th Edition (2019)
Authors – Scott Tilley - Shelly Cashman Series
Publisher - Course Technology, Cengage Learning

(or)

Systems Analysis and Design – 11th Edition (2016)
Authors – Tilley, Rosenblatt - Shelly Cashman Series
Publisher - Course Technology, Cengage Learning

Additional reading and example material will also be provided

Grading | Assessment
Your grade in this course is based on your performance on multiple activities and assignments. Since all graded assignments are related directly to course objectives and learning outcomes, failure to complete any assignment will result in an unsatisfactory course grade.

All written assignments are to be completed with proper grammar, punctuation, and spelling. Please carefully proofread your written assignments before submitting them for a grade. Coding assignments should include both properly indented code and screenshot of the output. Grades and review comments will be posted by professor typically within 1 week of assignment submission or exam submission.

Midterm Exam: There will be a midterm exam. The exam will be an open book, open internet style exam. The exam will test the student's acquisition of topics, concepts and competencies learned in this class up to mid-term.

Final Exam: There will be a final exam. The exam will be an open book, open internet style exam. The exam will test the student's acquisition of topics, concepts and competencies learned in this class. The final exam will only cover materials covered after the midterm. Midterm exam and Final exam maybe combined as a single final exam.

Please Note: Professor will not provide a "redo" or an opportunity for grade improvement for any assignment or exam for which a student received a low grade. It is the student responsibility to prepare for exams and to submit correct and most accurate assignments.

DESCRIPTION	**PERCENTAGE**
Homework	20%
Participation	10%
Midterm Exam	25%
Final Exam	25%
Final Team Project	20%
TOTAL POSSIBLE	100%

See the "Grades" section of Academic Policies for the complete grading policy, including the letter grade conversion, and the criteria for a grade of incomplete, taking a course on a pass/fail basis, and withdrawing from a course.

Course Outline
Start/End Dates: 01/22/2024 – 05/06/2024 | Mondays
Time: 2:00 – 4:35 PM
No Class Date(s): 2/19/2024 and 03/18/2024
Special Notes: Spring Break 03/18/24 - 03/24/24

Session 1, Mon, Jan 22, 2024, Introduction to Systems Analysis

- What is Systems Analysis and Design
- The Impact of Information Technology
- Information System Components
- Understanding the Business
- Impact of the Internet
- Type of Information Systems
- Information System Users and Their Needs

- Systems Development Lifecycle
- Overview of Systems Development Methodologies
- the 4 steps of the SDLC methodology
- Object Oriented Analysis and Design
- Agile Development Methodologies
- The Role of a Systems Analyst

- **Assignments (due one week from today):**
- **Reading:** Chapter 1

Session 2, Mon, Jan 29, 2024, Analyzing the Business Case

- Analyzing the Business Case
- Project Planning
- SWOT (Strength, Weakness, Opportunity, Threat) analysis
- Factors affecting system projects
- Identifying and Selecting Projects
- The System Service Request
- Project Initiation and Planning
- Feasibility Studies
- Cost-Benefit, NPV, ROI, Break-Even Analysis
- Developing a Baseline Project Plan
- A Project Scope Statement
- A Statement of Work document
- Presentation to Management

- **Assignments (due one week from today):**
- **Reading:** Chapter 2, Toolkit Part C

Session 3, Mon, Feb 5, 2024, Managing Systems Projects

- Managing Systems Projects
- The role of a Project Manager
- Project Planning and project scope
- Dividing the project into manageable tasks
- Estimating task effort
- Creating a WBS (Work Breakdown Structure)
- Project Scheduling
- Gantt charts, PERT/CPM charts
- Risk management
- Project monitoring and controlling
- Project reporting
- Software change control
- Key to project success

- **Assignments (due one week from today):**
- **Reading:** Chapter 3

Session 4, Mon, Feb 12, 2024, Requirement Gathering and Modeling

- Requirement Gathering and Modeling
- What is a requirement?
- Characteristics for successful requirement gathering
- Deliverables and artifacts
- Collecting Requirements
- The interview process
- Questionnaires and surveys
- Direct observations
- Document review
- JAD, RAD and Agile
- Prototyping
- Requirement Modeling

- **Assignments (due one week from today):**
- **Reading:** Chapter 4

Session 5, Mon, Feb 26, 2024, Data and Process Modeling

- Data and Process Modeling
- Modeling Tools
- Data Flow Diagrams
- Creating a Set of Data Flow Diagrams
- Data Dictionary
- Process Description Tools
- Logical Versus Physical Models

- **Assignments (due one week from today):**
- **Reading:** Chapter 5

Session 6, Mon, Mar 4, 2024, Object Oriented Modeling

- Object Modeling
- Overview of Object-Oriented Analysis and Modeling
- Object-Oriented Concepts and Terminologies
- Relationships among Objects and Classes
- Object Modeling with the Unified Modeling Language
- Use Cases, Use Case Diagrams, Use Case Narratives
- Class Diagrams and Object Models
- Sequence Diagrams

- **Assignments (due one week from today):**
- **Reading:** Chapter 6

Session 7, Mon, Mar 11, 2024, Implementation/Acquisition Strategies

- Software Implementation and Acquisition Strategies
- The Impact of the Internet
- Outsourcing/In-sourcing

- In-House Software Development Options
- Role of the Systems Analyst
- Analyzing Cost and Benefits
- The Software Acquisition Process
- Completion of Systems Analysis Tasks
- The Transition to Systems Design
- Systems Design Guidelines

- **Assignments (due one week from today):**
- **Reading:** Chapter 7

Midterm Exam

Session 8, Mon, Mar 25, 2024, Data Design

- Data Design
- Data Structures and Data Design Concepts
- Physical Database Design
- Structured Query Language (SQL)
- Why Relational?
- Elements of a Relational Database
- Tables, Rows, Columns, Relationships, indexes, views
- DDL - Data Definition language
- DML - Data Manipulation language
- Joining Tables
- Designing Fields and Composite Attributes
- Controlling Data Integrity and security
- Data Normalization, 1NF, 2NF, 3NF
- Normalization vs. Denormalization
- Entity Relationships and Cardinality
- File and Index Organization

- **Assignments (due one week from today):**
- **Reading:** Chapter 9

Session 9, Mon, Apr 1, 2024, System Architecture

- System Architecture
- Planning the Architecture
- In-House vs. Packaged Solutions
- Integrated Solutions, ERP, CMS, HCM
- Client/Server Architecture
- Internet-Based Architecture
- Cloud-Based Architecture
- 2-Tier, 3-Tier, N-Tier Architecture
- Online, Real-Time, and Batch Processing
- Systems Design Completion

- **Assignments (due one week from today):**
- **Reading:** Chapter 10

Session 10, Mon, Apr 8, 2024, System Development – Part I

- System Development - Introduction to Programming
- Different Languages for Different Purposes
- Compiled vs. Interpreted Languages
- Procedural vs. Object Oriented Languages
- Programming Language Keywords
- Programming Constructs and Fundamentals
- Defining Variables
- Simple vs. Complex Variables (arrays & objects)
- Comparison and Logical Operators
- Looping and Iterations
- Defining Functions

- **Assignments (due one week from today):**
- **Reading:** Instructor provided and internet research

Session 11, Mon, Apr 15, 2024, System Development – Part II

- Writing a Program
- Writing an Algorithm
- Pseudo-code and Actual Code
- Searching, Sorting and Recursive Algorithms
- Program Logic and Control Flows
- Testing a Program for Syntax Errors
- Testing a Program for Logical Errors
- Structured vs. Object Oriented Coding Practices
- Examples of Programs in Different Languages

- **Assignments (due one week from today):**
- **Reading:** Instructor provided and internet research

Session 12, Mon, Apr 22, 2024 Managing System Implementation - Teams 1,2,3 Presentations

Topics should include:

- Managing Systems Implementation
- Software Quality Assurance
- Overview of Application Development
- Structured Application Development
- Object-Oriented Application Development
- Agile/Scrum Application Development
- Coding
- Testing the System
- Documentation
- Management Approval
- System Installation and Evaluation

- Operational and Test Environments
- Training
- Data Conversion
- System Changeover
- Post-Implementation Tasks

Session 13, Mon, Apr 29, 2024 System Support, Post Go-Live - Teams 4,5,6 Presentations
Topics should include:

- System Support, Security and Post Go-Live
- User Support and Operation
- Maintenance Tasks
- Maintenance Management
- System Performance Management
- System Security Overview
- Security Levels
- Backup and Recovery
- System Obsolescence
- Future Challenges and Opportunities

Session 14, Mon, May 6, 2024 Final Exam

- Final Exam

NOTES:

The syllabus may be modified to better meet the needs of students and to achieve the learning outcomes.

The School of Professional Studies (SPS) and its faculty celebrate and are committed to inclusion, diversity, belonging, equity, and accessibility (IDBEA), and seek to embody the IDBEA values. The School of Professional Studies (SPS), its faculty, staff, and students are committed to creating a mutually respectful and safe environment (*from the SPS IDBEA Committee*).

NYU SCHOOL OF PROFESSIONAL STUDIES

New York University School of Professional Studies Policies

1. Policies - You are responsible for reading, understanding, and complying with University Policies and Guidelines, NYU SPS Policies and Procedures, and Student Affairs and Reporting.

2. Learning/Academic Accommodations - New York University is committed to providing equal educational opportunity and participation for students who disclose their dis/ability to the Moses Center for Student Accessibility. If you are interested in applying for academic accommodations, contact the Moses Center as early as possible in the semester. If you already receive accommodations through the Moses Center, request your accommodation letters through the Moses Center Portal as soon as possible (mosescsa@nyu.edu | 212-998-4980).

3. Health and Wellness - To access the University's extensive health and mental health resources, contact the NYU Wellness Exchange. You can call its private hotline (212-443-9999), available 24 hours a day, seven days a week, to reach out to a professional who can help to address day-to-day challenges as well as other health-related concerns.

4. Student Support Resources - There are a range of resources at SPS and NYU to support your learning and professional growth. For a complete list of resources and services available to SPS students, visit the NYU SPS Office of Student Affairs site.

5. Religious Observance - As a nonsectarian, inclusive institution, NYU policy permits members of any religious group to absent themselves from classes without penalty when required for compliance with their religious obligations. Refer to the University Calendar Policy on Religious Holidays for the complete policy.

6. Academic Integrity and Plagiarism - You are expected to be honest and ethical in all academic work. Moreover, you are expected to demonstrate how what you have learned incorporates an understanding of the research and expertise of scholars and other appropriate experts; and thus recognizing others' published work or teachings—whether that of authors, lecturers, or one's peers—is a required practice in all academic projects.

Plagiarism involves borrowing or using information from other sources without proper and full credit. You are subject to disciplinary actions for the following offenses which include but are not limited to cheating, plagiarism, forgery or unauthorized use of documents, and false form of identification

Turnitin, an originality detection service in NYU Brightspace, may be used in this course to check your work for plagiarism.

Read more about academic integrity policies at the NYU School of Professional Studies on the Academic Policies for NYU SPS Students page.

7. Use of Third-Party Tools - During this class, you may be required to use non-NYU apps/platforms/software as a part of course studies, and thus, will be required to agree to the “Terms of Use” (TOU) associated with such apps/platforms/software.

These services may require you to create an account but you can use a pseudonym (which may not identify you to the public community, but which may still identify you by IP address to the company and companies with whom it shares data).

You should carefully read those terms of use regarding the impact on your privacy rights and intellectual property rights. If you have any questions regarding those terms of use or the impact on the class, you are encouraged to ask the instructor prior to the add/drop deadline.