



## Information Sciences and Technology

### Course Syllabus

# IT216 Systems Analysis and Design

#### Catalog Description

Students survey and apply techniques in analyzing and modeling information systems. Requirements are derived in various domains and abstracted at conceptual, logical, and physical levels. Process, data, and state modeling are applied through a project that follows a systems development lifecycle. Object modeling is explored and contrasted. A user-centered design approach is adopted.

#### Prerequisites

IT 214 and IT 102 or IT 206.

The prerequisite course must be completed prior to, not concurrently with, this course. If you have questions about this policy, please contact the Instructor so that problems can be avoided later on (such as being dropped from the course).

#### Rationale

This course will cover the principals of information systems including analysis and design. Students will learn techniques in data requirements collection and analysis along with methods to modeling data needs. Modeling of data will occur at the conceptual, logical, and physical levels along with an ability to compare and contrast the different approaches given their merits and limitations. Students will understand the importance and constraints imposed by the domain of the information system along with business rules that guide the design. Functional dependencies and domain normalization will also be discussed as part of the requirements analysis. Object-oriented information system modeling will be surveyed. User-centered design techniques will be explored.

#### Objectives

Students will demonstrate the ability to extract, analyze, and organize end-user requirements. Included will be an ability to utilize process, data, and state modeling in a variety of domains. Students will also examine data-oriented and object-oriented system design.

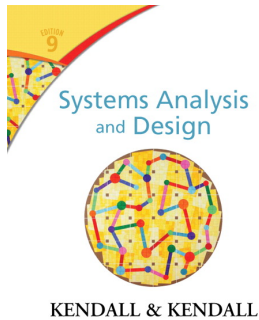
Upon successful completion of the course, students will be able to:

- Develop a requirements document that details and models an information system design.
- Utilize data flow diagramming, entity relationship modeling, and state process modeling in user requirement analysis.
- Compare and contrast conceptual, logical, and physical data models.
- Demonstrate an understanding of object and procedural modeling.

- Recognize and incorporate user requirements, business rules and constraints into the design of an information system.
- Address functional dependencies in the normalization of a system.

## Textbook

There is one required textbook for this course:



- System Analysis and Design, 9<sup>th</sup> Edition  
Kenneth E. Kendall, Rutgers University  
Jullie E. Kendall  
Pearson 2014
  - ISBN-10: 0133023443
  - ISBN-13: 978-0133023442

## Faculty and Staff

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## Grading

Final averages are assigned a letter grade according to the following ranges:

Percentage	Grade	Courses
[97, ∞)	A+	Passing
[93, 97)	A	Passing
[90, 93)	A-	Passing
[87, 90)	B+	Passing
[83, 87)	B	Passing
[80, 83)	B-	Passing
[77, 80)	C+	Passing
[73, 77)	C	Passing
[70, 73)	C-	Conditional Passing
[60, 70)	D	Conditional Passing
[0, 60)	F	Failing

\* Conditional Passing letter grades are considered passing for undergraduate courses. However, a Passing letter grade is required in the undergraduate Information Technology program for any course that is a prerequisite for other courses.

The final grades will be determined based on the following components. Eventual modifications on the distribution below will be explicitly informed in class:

Activity	Distribution
<b>Checkpoints</b>	10%
<b>Exercises</b>	15%
<b>Examinations</b>	
○ Midterm	20%
○ Final	20%
<b>Final Project</b>	25%
<b>Peer Evaluation</b>	5%
<b>Participation</b>	5%

Note:

- If you are encountering difficulty in meeting course requirements, or should some dire circumstance arise, it is important you are proactive in contacting the Instructor prior to the due date. Potential problems can be minimized with an email. Delay in bringing your circumstances to the Instructor's attention will substantially decrease the likelihood of receiving a favorable outcome.

The grading components are outlined in the following sections. Note that all assignments of a given component are given equal weight.

### Checkpoints

Checkpoints are a crowd-sourced approach to learning and will be utilized throughout the semester to evaluate a student's mastery of the materials and learning outcomes. Students will create, evaluate, discuss, and answer questions related to the course modules. Involvement in the checkpoints will be anonymous to other students however the instructor will have access to the contributors in order to determine involvement. You should prepare for checkpoints by understanding the material previously presented in the session module including any reading assigned before the checkpoint.

Checkpoints serve to have students carefully think about topics presented in the course and potentially how they relate to the learning outcomes. As a reinforcement of the materials in the course, students will have the ability to consider misconceptions, ambiguity, and potential alternative interpretations of a topic area. Checkpoints also serve as a self-assessment point on understanding while requiring students to clarify their understanding of a topic area. Finally, students will be able to reinforce their knowledge of an area by reflecting on the contributions of other students in the course. This allows students to sharpen higher-order cognitive skills that will also prove helpful when applied to requirements analyses.

As checkpoints are part of the flow of the modules and are a group activity, requests to complete checkpoint assessments at a different time will not be honored except in exceptional circumstances. Exceptional circumstances include a documented medical excuse, a serious family emergency, or scheduled university-approved off-campus event. These must be arranged with the Instructor in advance.

### Exercises

Exercises provide an opportunity for application of the topics presented in the course modules. Some exercises may be in session whereas others may be completed outside the session. Exercises are intended to be individual work unless otherwise noted. If an exercise is designated as being completed as a group, it will be the responsibility of the student to put together a group. If a group cannot be formed in a timely manner then it is the individual student's responsibility to complete all the group work of the exercise individually.

### Examinations

The exams will cover material presented in the text and lecture and will be used to evaluate your mastery of terms, concepts, and application. There will be a review period the session before each exam. You should prepare for the exams by understanding the material presented in the class session, notes, exercises, and the readings in the text. Exams will be a combination of short answer, fill in the blank, and multiple choice in addition to process, data, and state modeling. To complete these exams you will not be allowed to use your notes, text, web, etc. Exams are retained by the Department and are not returned to students, however grades are posted on Blackboard.

Anticipated exam dates are shown on the Course Outline. As exam answers may be reviewed, requests to take exams at a different time will not be honored except in exceptional circumstances. Exceptional circumstances include a documented medical excuse, a serious family emergency, or scheduled university-approved off-campus event. These must be arranged with the Instructor in advance.

### Final Project

During the semester, there will be one project that you will complete. The project is an information system design and as a reasonably large assignment will take several sessions to complete. Each student may be required to work in a group to complete the project and this will be determined later in the semester. As the project will be due near the end of the semester, late submissions will not be accepted.

### Participation

Students are expected to complete any required preparatory work, attend each course session, and participate actively in lectures, discussions, and exercises. Active participation is essential in a course dealing with abstract concepts and data modeling. Participation should take the form of questions, feedback, analysis, information, and examples all in support of the class's exploration of the topics, reading, and assignments. As members of the academic community, all students are expected to participate regardless of their proficiency with the subject matter.

It should be understood that the grade for participation may be subjective and competitive in nature. This means that there are no concrete rules for exactly what constitutes full participation. A well thought out contribution will always be more useful than discussions that stray significantly from the topic at hand.

Final grades will be posted to Patriot Web, and will not be emailed or appear on Blackboard. A student with a 'hold' on their academic account will be unable to access final grades until the Registrar has removed the hold.

## Course Outline

Week	Module Topic(s)	Grade Component Due	Reading Due
01	<ul style="list-style-type: none"> <li>○ Welcome to the Course</li> <li>○ System, Roles and Development Methodologies</li> </ul>		<ul style="list-style-type: none"> <li>○ Chapter 1</li> </ul>
02	<ul style="list-style-type: none"> <li>○ Project Management</li> <li>○ Information Gathering</li> </ul>	<ul style="list-style-type: none"> <li>○ Checkpoint: 01</li> </ul>	<ul style="list-style-type: none"> <li>○ Chapter 3</li> <li>○ Chapter 4</li> <li>○ Chapter 5</li> </ul>
03	<ul style="list-style-type: none"> <li>○ Agile Modeling and Prototyping</li> </ul>	<ul style="list-style-type: none"> <li>○ Checkpoint: 02</li> </ul>	<ul style="list-style-type: none"> <li>○ Chapter 6</li> </ul>
04	<ul style="list-style-type: none"> <li>○ Data Flow Diagrams</li> </ul>	<ul style="list-style-type: none"> <li>○ Checkpoint: 03</li> </ul>	<ul style="list-style-type: none"> <li>○ Chapter 7</li> </ul>
05	<ul style="list-style-type: none"> <li>○ Object Oriented System Analysis &amp; Design Using UML</li> </ul>		<ul style="list-style-type: none"> <li>○ Chapter 10°</li> </ul>
06	<ul style="list-style-type: none"> <li>○ Design Using UML (cont.)</li> <li>○ Midterm Examination Review</li> </ul>	<ul style="list-style-type: none"> <li>○ Checkpoint: 04</li> </ul>	<ul style="list-style-type: none"> <li>○ Chapter 10°</li> </ul>
07	<ul style="list-style-type: none"> <li>○ Midterm Examination</li> </ul>		
08	<ul style="list-style-type: none"> <li>○ Designing Effective Output</li> </ul>		<ul style="list-style-type: none"> <li>○ Chapter 11</li> </ul>
09	<ul style="list-style-type: none"> <li>○ Designing Effective Input</li> </ul>		<ul style="list-style-type: none"> <li>○ Chapter 12</li> </ul>
10	<ul style="list-style-type: none"> <li>○ Designing Databases</li> </ul>		<ul style="list-style-type: none"> <li>○ Chapter 13°</li> </ul>
11	<ul style="list-style-type: none"> <li>○ Designing Databases (cont)</li> <li>○ Human Computer Interaction</li> </ul>	<ul style="list-style-type: none"> <li>○ Checkpoint: 05</li> </ul>	<ul style="list-style-type: none"> <li>○ Chapter 13°</li> <li>○ Chapter 14°</li> </ul>
12	<ul style="list-style-type: none"> <li>○ Human Computer Interaction</li> </ul>	<ul style="list-style-type: none"> <li>○ Checkpoint: 06</li> </ul>	<ul style="list-style-type: none"> <li>○ Chapter 14°</li> </ul>
13	<ul style="list-style-type: none"> <li>○ Final Project</li> </ul>		
14	<ul style="list-style-type: none"> <li>○ Final Project Work Session</li> <li>○ Final Examination Review</li> </ul>		
-	<b>Exam Week Meeting</b>		
	<ul style="list-style-type: none"> <li>○ Final Examination</li> </ul>	<ul style="list-style-type: none"> <li>○ Project</li> </ul>	

Note: ° Indicates partial chapter

You will be expected to complete reading assignments before attending the course session. Additional reading materials may be assigned as the semester progresses or if the Instructor finds something particularly relevant to an upcoming topic.

***This schedule is subject to revision before and throughout the course.***

***Registered students should see [the Blackboard Learning System](#) for the latest class schedule.***

### Important Dates

Dates for adding, dropping the course, etc. are available via: [registrar.gmu.edu](http://registrar.gmu.edu)

### Religious Holidays

A list of religious holidays is available on the [University Life Calendar](#). Any student whose religious observance conflicts with a scheduled course activity must contact the Instructor at least 2 modules in advance of the conflict date in order to make alternative arrangements.

### Attendance Policy

Scheduled course sessions will be spent on clarification, amplification, and review of material through the use of slides, examples, and exercises. Lecture slides are complements to the lecture session, not substitutes for it. Each course session is an excellent time for you to raise questions, request additional examples, and get explanations of any ideas that are still unclear to you. As members of the academic community, all students are expected to contribute regardless of their proficiency with the subject matter.

Contributions are evaluated by their quality as well as their frequency, however quality is much more important than quantity. Participation contributions are based on the following criteria:

- Thoughtfulness
- Usefulness
- Thoroughness
- Clarity

Students are expected to make prior arrangements with Instructor if they know in advance that they will miss any class and to consult with the Instructor as soon as possible if they miss any class without prior notice. Any student who expects to miss more than one class session is advised to drop the course and take it in a later semester when he/she can attend every class.

Departmental policy requires students to take exams at the scheduled time and place, unless there are truly compelling circumstances supported by appropriate documentation. Except in such circumstances, failure to arrive to the exam site on time for a scheduled exam will result in a score of zero (0) for that exam, in accordance with [Mason policy on final exams](#). Students should not make travel plans or other discretionary arrangements that conflict with scheduled classes and/or exams. If the University is closed due to weather or other unforeseen conditions, final exams may be rescheduled – students are strongly advised not to make plans that would prevent them from attending exams that may be rescheduled during the entire [exam period](#).

### Classroom conduct

In order to keep an environment conducive to learning, disruptions should be kept at a minimum while attending a course session. Social discussions and electronic devices are potential distractions while attending a course session. Cell phones, pagers and other handheld devices should be turned off or set to 'silent' mode and not used while in the session. Personal computers can be used if university computers are not provided. University computers are to be used only if such use is directly related to the course activity in progress. For some activities the Instructor may ask that computers/devices not be used in order to maximize student engagement. Except through prior arrangement with the Instructor and the Office of Disability Services [ODS], any form of new recording of the course lecture is not allowed, except by the Instructor.

**Communications**

As communication and course changes may be discussed only in the course sessions, your involvement in these sessions is recommended.

General communication, access to the learning modules, course materials, and grades will occur through Blackboard with our section for this course being 'YYYYTT.XXXXX: IT-216-### (TT YYYY)', where YYYY is the current year, TT is the current term, XXXXX is the course identifier, and ### is the section in which you are enrolled. If you need to download any information from the course, you should do this on an ongoing basis, and definitely before the course is over. You are expected to check your university email and the Blackboard course section regularly. To assure you are prepared for the course sessions you should confirm that you can view all the materials from within the Blackboard course section.

Course materials will primarily be provided in the PDF file format. As course materials may use features of the latest specification, you should install the current major release of [Adobe Acrobat Reader](#).

Instructors, staff, and Teaching Assistants will take care to protect the privacy of each student's communication. Communication on issues relating to the individual student should only be conducted using email or during office hours. Email is the preferred method and university policy requires you to use your university email account. You should not use any discussion forums on Blackboard for this purpose.

**Privacy**

The Instructor will not discuss issues relating to an individual student with anyone lacking a need to know without prior written permission of the student. This includes a student's family members and other students. Under no circumstances will a student's graded work be returned to another student.

Instructors, staff, and Teaching Assistants will take care to protect the privacy of each student's scores and grades.

**Disability Accommodations**

[The Office of Disability Services \(ODS\)](#) works with students with disabilities to arrange for appropriate accommodations to ensure equal access to university services. Any student with a disability of any kind is strongly encouraged to register with ODS as soon as possible and take advantage of the services offered.

Accommodations for students with disabilities must be made in advance as ODS cannot assist students retroactively. At least one week's notice is required for special accommodations related to examinations. Any student who needs accommodation should contact the Instructor during the first week of the semester so the sufficient time is allowed to make arrangements.



## **Honor Code**

All members of the Mason community are expected to uphold the principles of scholarly ethics. Similarly, graduating students are bound by the ethical requirements of the professional communities they join. The ethics requirements for some of the communities relevant to Information Technology graduates are available via the following links:

- [ACM Code of Ethics and Professional Conduct](#)
- [IEEE Code of Ethics](#)
- [EC-Council Code of Ethics](#)

In this course you are expected to create academic works that are completely new and original. In contrast, academic dishonesty is misrepresenting someone else's work as your own, either with or without his/her knowledge. This includes the past or current work, whether in whole or in part, of yourself, any other source or person, book, article, Internet source, student, friend, colleague, relative, faculty member, or absolute stranger. Academic dishonesty can be plagiarism, collusion, or outright cheating. A reference to clarify what is and is not plagiarism can be found at the [IEEE](#).

Since you will be allowed to work on your own time on checkpoints, exercises, and the project, it is expected that you will continue to work independently unless the Instructor allows it otherwise. Assignments designated as group work require one assignment to be turned in for the entire group with each group member's name identified. All other assignments are to reflect your own individual work. Submission of an assignment under your name indicates that you understand and agree to abide by the honesty policy and that you agree to allow your assignment to be submitted to originality checking repositories.

Plagiarism and other academic actions contrary to the university's [Honor System and Code](#) will be addressed in accordance with these policies. These are single instance of policies. There are no second chances. All students involved will receive an 'F' for the course.