

King Saud University

College of Computer and Information Sciences

Information Systems Department

**IS Graduation Project I (IS498) and
IS Graduation Project II (IS499)**

Handbook

2018

Contents

Part One: Graduation Project I (IS 498)	3
1. IS 498 Course Description	3
2. IS 498 Objectives	3
3. IS 498 Evaluation Criteria.....	3
4. IS 498 Obligations	4
4.1 Student obligations	4
4.2 Advisor obligations	4
4.3 Examination committee obligations	4
5. IS 498 Report	5
6. IS 498 oral presentation	5
Part Two: Graduation Project II (IS 499)	6
7. IS 499 Course Description	6
8. IS 499 Objectives	6
9. IS 499 Evaluation Criteria.....	6
10. IS 499 Obligations	7
10.1 Student obligations	7
10.2 Advisor obligations	7
10.3 Examination committee obligations	7
11. IS 499 Report	7
12. IS 499 oral presentation	8
13. Project User's Manual	9
14. Report Formatting.....	9
Part Three: Appendix	12
IS 498 Syllabus	
IS 499 Syllabus	
Copyright Form	
CLO Survey for IS 498	
CLO Survey for IS 499	
Exit Survey IS 499	
Evaluation Forms	
IS 498 Proposal Form	
IS 498 Selection Form	

Part One: Graduation Project I (IS 498)

1. IS 498 Course Description

The previous courses have provided students of the Information Systems department with strong and sufficient knowledge to develop information systems. The next logical stage is that the IS students must acquire hands-on experiences on developing real world information systems. The students should be familiarized with real world problems encounter during the development of real world information systems. Furthermore, the students should be trained to work in teams. The purpose of the capstone project I is to provide an opportunity for the students to apply the information systems knowledge acquired in the core courses to the information system analysis and design project. The student will select a project proposal suggested by a faculty advisor who will provide guidance and evaluate the work on a project. In this course, the students will be organized into groups. The number of students in each group should be two or three students. Each group will develop a real world information system in two stages: The first stage will be carried out in IS498 course where students of each group must identify a problem domain, define a problem, identify and specify the requirements in details, analyze and document the current system, and design a particular system in details which includes the definitions of all the required system models and diagrams such as the data model and the functional model. The second stage will be carried out in the IS499 course (the project 2).

2. IS 498 Objectives

At the end of the project I (IS498), students should be able to do the following:

- a) Understand the complex and interdisciplinary nature of real work.
- b) Demonstrate the ability to apply information systems concepts and techniques.
- c) Define the importance of research, planning, and evaluation in productive work.
- d) Be able to work with others in an appropriate manner on the development of system analysis and design.
- e) Integrate information systems principles into a written technical document.
- f) Be able to manage; their own time and work; how to modify and adjust planning and actions to complete the project; and to overcome unforeseen obstacles.

3. IS 498 Evaluation Criteria

Students of each group will present their work in front of examination committee. The final grade (marks) will be distributed between faculty advisor and the examination committee (two IS faculty members) and evaluated based on capstone project work by project I faculty advisor (60% of the final grade) and examination committee (40% of the final grade). Then, the grade will be submitted to the project committee to calculate and confirm the final grade. The final grade (marks) given in project I depends on the following criteria. At the end of the course, each group must submit a formal report digitally to the projects committee by Tuesday of the week before the preparatory week; this report contains all required components such as requirements, the specifications, and the system models. Students of each group must present their effort that has been done in the IS498 course (the project I). The table below shows the evaluation criteria.

Criterion	Advisor	Examiner committee
Attendance to project meetings, and seminars if possible.	Yes	No
Completion of all project requirements (functional and non-functional requirements).	Yes	Yes
Professional (clear, complete and consistence) presentation of the system requirements and specification report.	Yes	Yes
Creativity and independent work in solving problem and overcome faced obstacles.	Yes	No
Team work, cooperation with fellow students and the advisor.	Yes	No
The quality (logical and correctness) of the analyzed and designed system.	Yes	Yes
Difficulty and size of the work.	Yes	Yes

Students must begin working on the project immediately after the project is assigned to them. Every student should plan to spend at least 192 hours working per semester on the project. The student must meet the faculty advisor every week in order to discuss questions, problems, etc.

4. IS 498 Obligations

4.1 *Student obligations*

Before starting the capstone project, students should start planning their projects by performing brainstorming, literature review, and defining the expected outcomes. During the project I, students must meet weekly with the project advisor and prove good progress. At the end of the project I, students must submit the report in soft copy form at the end of the academic semester to their faculty advisor and the projects committee.

4.2 *Advisor obligations*

The faculty advisor should introduce the project requirements to new students and provide suggestions and guidelines. The advisor should provide the academic structure for the project and advise the student in developing a project plan during. The advisor should also advise the students in obtaining the appropriate system requirements and design, and regarding the preparation of an appropriate final written report. Every four weeks, the faculty advisor needs to evaluate students' effort as a team and their mastery of, and commitment to, the assigned project tasks. The advisor should document (somehow) his related evaluations comments to use them later when he makes the final evaluation at the end of the semester.

4.3 *Examination committee obligations*

The role of the examination committee is to act an external evaluation team that checks for completeness, and correctness of the specified sections of the project report and makes sure that the completed work is in accordance with commonly recognized practices of appropriate systems analysis and design.

5. IS 498 Report

The student group must perform a comprehensive analysis of the topic area and write a report. This process is conducted under the supervision of the advisor. The report should conform to the following outline unless modified by the capstone project committee:

- Title page (includes the names, emails and student Identification numbers).
- Table of contents, table of tables, and table of figures pages.
- Project Abstract
- Introduction
- Objectives and motivations
- Time and resource schedule using project management tool such as the Gantt chart covering requirements of the project 1.
- Review of the literature/survey for existing solutions if applicable (commercial and noncommercial)
- In developing an information system, a particular information system development methodology should be used such as traditional SDLC or agile etc.
- Definition of positional users in order to utilize them in data gathering and system testing.
- Detailed description of proposed project functional and nonfunctional requirements
- Description of proposed project analysis and design. Students **must include** the following analysis and design tools:
 1. The use case diagram and use case scenario/description.
 2. The logic diagram of use cases using Unified Modeling Language (UML) Activity Diagram (UML ADs), Business Process Modeling and Notation (BPMN2.0), or similar tool.
 3. The ER diagram and rational schema.
 4. The sequence diagram
 5. The class diagram.
- Social, ethical, legal, global, and security impact of the project on the society
- Reference list.

6. IS 498 oral presentation

Communication and presentation skills are among the top priorities of any employer. All the group members must participate in the oral presentation that should be held for about 20-30 minutes. The oral presentation will be scheduled by the projects committee during the preparatory exam week. Here are the general guidelines and requirements:

1. A visual presentation is required using any professional tools such PowerPoint. The final presentation should cover all main parts of the project which include; but not exclusive:
 - Project Title and team member names.
 - Presentation outline
 - Introduction, motivation, and objectives
 - Review of the Literature / survey for existing solutions
 - Description of proposed project requirements
 - Description of proposed project design, and testing analysis.
 - Lessons learned from the Project I and what difficulties arose during the course of the project and how they resolved them
 - Simple demo of the prototype, if there is.
2. General guidelines for final presentation
 - Please do not read from the screen. Be sufficiently familiar with your presentation to speak fluidly.

- Introduction that grabs the attention of the audience
- Do not block your audience's view of the screen.
- Test your presentation early in the process to ensure its legibility.
- Make certain that your voice is audible from the back of the room.
- Your audience is eager to be impressed, so be relaxed, smile and speak naturally.
- Look in the eyes of the audience as you make your presentation.
- Make sure that the project advisor has final presentation files at least one day in advance.
- Practice the complete presentation, with audiovisuals, more than once
- Please arrive in sufficient time to copy your presentation to the computer and test it before the session begins.

After the presentation, the facilitator will open the floor for questions by the examination committee or anyone else in attendance of the material presented.

Part Two: Graduation Project II (IS 499)

7. IS 499 Course Description

In the Capstone project II (IS499) course, each group will continue developing the information systems they started in the capstone project I (IS498) course. Groups must use appropriate tools to develop their information systems while adhering to good programming practices. These development tools must be new, up to date, and fully approved in the IS design and implementation environment. Students register for this course only after they have passed capstone project I (IS498) and other prerequisite courses. Students will continue working with the selected faculty advisor that will provide guidance and evaluate the work on a project.

8. IS 499 Objectives

At the end of project II, students should be able to do the following:

- a) Understand the complex and interdisciplinary nature of practical work.
- b) Demonstrate the ability to implement information system concepts and techniques.
- c) Be able to implement the developed the information system analysis and design conducted in the project I.
- d) Be able to work with others on information system development in appropriate manner.
- e) Be able to write technical report to reflect project II's effort and deliver a full information system with appropriate documentations.
- f) Be able to manage their own time and work, how to modify and adjust planning and actions to complete the project, and to overcome unforeseen obstacles.

9. IS 499 Evaluation Criteria

Student of each group will present their work in front of examination committee. Grade will be evaluated based on capstone project work by project II faculty advisor (60% of the final grade) and examiners (40% of the final grade). Then, the grade will be submitted to the project committee to calculate and confirm the final grade. The final grade (marks) given in project II (IS499) is depend on the following criteria. At the end of the course, each group must complete and submit the formal report digitally to the projects committee by Tuesday of the week before the preparatory week; this report contains all required components in the project II. Students of each group must present their effort that has been done in the IS499 course (the project II). The table below shows the evaluation criteria.

Criterion	Advisor	Examiner committee
Attendance to project meetings, and seminars if possible.	Yes	No
Implementation of all project requirements (functional and non-functional requirements).	Yes	Yes
Professional (transparency, usefulness, clear, complete and consistence) presentation of the system implementation report.	Yes	Yes
Team work, cooperation with fellow students and the advisor.	Yes	No
The quality (correctness) of the system implementation.	Yes	Yes
Difficult and size of the work, and the future work.	Yes	Yes

Students must begin working on the project immediately at the beginning of the subsequent semester after they finish project I (IS498) with successful grade. Every student should plan to spend at least 192 hours working per semester on the project. The student must meet the advisor every week in order to discuss questions, problems, etc.

10. IS 499 Obligations

10.1 Student obligations

Before starting the capstone project II, students should start planning the project implantation, coding, testing, and delivering their projects. During the project II, student should meet at weekly with the project advisor. At the end of the capstone project II, turn in the presentation and written report at the end of the academic semester and make sure both faculty advisor and project committee have a soft copy of the final project report.

10.2 Advisor obligations

The faculty advisor should review the capstone project II requirements with the students and provide suggestions and guidelines if required. He should provide the academic structure for the project, and advise the student in developing, testing, and delivering a project during the academic semester. Also, the advisor should advise the assist the students regarding the preparation of an appropriate final presentation and written report. Every four weeks, the faculty advisor needs to evaluate students' efforts as a team and their mastery of, and commitment to, the assigned project tasks. The advisor should document (somehow) his related evaluations comments to use them later when he makes the final evaluation at the end of the semester.

10.3 Examination committee obligations

The role of the examination committee is to act an external evaluation team that checks for completeness of the specified sections of the project report, the verification that completed work is in accordance with commonly recognized practices of appropriate systems implementation, and testing; and that the promised work to be done has been delivered completely and clearly.

11. IS 499 Report

The group must submit a final report during the preparatory week of the academic semester and before the first week of the final exams. The project report should conform to the following outline unless modified by the capstone project committee.

- Project I report with all refinements performed to the system analysis and design (this includes any changes that have been done to any diagrams in the project I)
- Required HW and SW resources.
- Description of proposed project implementation, and testing.
- Testing plan and its results.
- Optionally, student may choose 2-4 use cases and implement them
- Lessons learned and professional growth impacts of the project on the team members
- Conclusion and future work that can be done on the project.
- Sample code for the selected programming language
- System installation and simple user manual for the proposed system
- Snapshots of main execution screens of the developed system
- Updated reference list.

12. IS 499 oral presentation

Communication and presentation skills are among the top priorities of any employer. All the group members must participate in the oral presentation which should be held for about 30 minutes. The oral presentation will be scheduled by the projects committee during the preparatory exam week. Here are the general guidelines and requirements:

1. A visual presentation is required using any professional tools such PowerPoint or Prezi. The final presentation should cover all main parts of the project which include; but not exclusive:
 - Project Title and team member names.
 - Presentation outline
 - Introduction, motivation, and objectives
 - Required HW and SW resources
 - Description of proposed project design, implementation, and testing.
 - Conclusion and future work that could be done on the project.
 - Lessons learned from the Project II and what difficulties arose during the course of the project and how did they resolve them?
 - Full demo of the implemented system.
2. The final presentation should address the following question:
 - Did the final project achieve the intended results or not and if not why?
3. General guidelines for final presentation
 - Please do not read from the screen. Be sufficiently familiar with your presentation to speak fluidly.
 - Introduction that grabs the attention of the audience
 - Do not block your audience's view of the screen.
 - Test your presentation early in the process to ensure its legibility.
 - Make certain that your voice is audible from the back of the room.
 - Your audience is eager to be impressed, so be relaxed, smile and speak naturally.
 - Look in the eyes of the audience as you make your presentation.
 - Make sure that the project advisor has final presentation files at least one day in advance.
 - Practice the complete presentation, with audiovisuals, more than once
 - Please arrive in sufficient time to copy your presentation to the computer and test it before the session begins.

After the presentation, the facilitator will open the floor for questions by the examination committee or anyone else in attendance of the material presented.

13. Project User's Manual

The User's Manual should contain the following sections:

- List of required hardware and software
- List of all source files and supporting software systems (e.g. DBMS) necessary for installation
- Installation instructions including verification of successful installation. Exceptional situations should be discussed including instructions on how to handle these errors
- Usage of the program described including step by step navigation through the system, including necessary figures of Forms and Menus.

The group should submit source code (java, C#, etc) with SDK if possible, and final report in word (.doc) format. The final project report must be submitted using word processor with the following format:

14. Report Formatting

The final project report must be submitted using **Word Processor** with the following format:

Heading level	Example	Font size and style
Title (centered)	<u>Lecture Notes ...</u>	18 point, bold and underlined
1 st -level heading	<u>1. Introduction</u>	16 point, bold and underlined
2 nd -level heading	<u>2.1 Printing Area</u>	14 point, bold and underlined
3 rd -level heading	Headings. Text follows ...	14 point, bold

Paragraphs:

The body of the final report is written in 12 pt Times New Roman font, single line spacing.

Tables:

All tables should be numbered consecutively and captioned. The caption, a title or description of the table, should be 10 pt Times New Roman, bold, and centered above the table. It should be styled in either title case lower or upper case or sentence case (first word capitalized, balance lower case letters). The body of the table should be no smaller than 9 pt. The use of boldface and/or italics is encouraged to make necessary distinctions within the table. Using the Insert: Reference: Caption tool will make this easier. Table 1 below illustrates the proper captioning and positioning of a table.

Table 1: Student Grade Distribution

Term	Number of students	Number of A's	Number of B's	Number of C's
Fall 2008	47	10	15	22
Fall 2009	47	12	18	17

Tables should be positioned within the body of your report or landscaped on the next page if they are very large. If the tables are placed within the text of the paper, it is preferable to position them at the top of the page. If positioned within the text, there should be a minimum of two (2) line spaces between the table end and the text. All tables should be properly sized to fit the dimensions of the text page. Do not allow your tables to split across two pages – place them on

a separate page if necessary to avoid this. Extensive tables, raw data, and supplementary information can be placed in an appendix; however, the tables must still be labeled and referred to in the text.

Figures:

All figures; photographs, graphs and/or line drawings; should be numbered consecutively and captioned. The caption, a title or description of the figure, should be 10 pt. Times Roman, bold and centered below the figure. It should be styled in either title case upper or lower case or sentence case (first word capitalized, balance lower case letters). Good quality photographs, figures, graphs and line drawings should be positioned within the body of your report. An example is shown in Figure 1 below. If figures are placed within the text of the paper, it is preferable to position them at the top of the page. If positioned within the text, there should be a minimum of two (2) line spaces between the figure caption and the text.

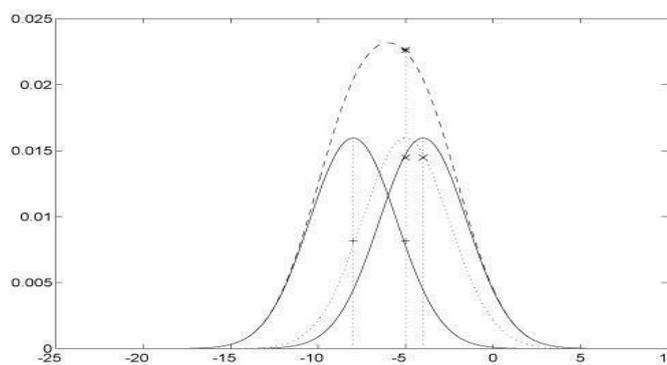


Fig. 1. One kernel at x_s (dotted kernel) or two kernels at x_i and x_j (left and right) lead to the same summed estimate at x_s .

Footnotes:

Footnotes should be numbered consecutively using superscript numbers. They should be positioned flush left at the bottom of the column/page in which the first reference appears. The text of the footnote should be 8 pt Times New Roman, with 10 pt line spacing, the length not to exceed the dimensions of the specific column size (for 8 ½ x 11 inch). The footnote should be preceded by a ½ inch thin rule or line. There should be one (1) line space between the line and the text of the footnote itself. The easiest way to do this is to use the Insert: Reference: Footnote function. Footnotes are useful for defining acronyms and comments that would otherwise break up the flow of ideas. They are not for references.

Equations and Formula:

Equations should follow the general text specifications; however, they should be set apart from the body of the text and centered in the column. For example, equation 1 below shows a familiar equation properly formatted:

$$E = mc^2 \tag{1}$$

Use two line spaces to separate equations from text. Equations should be numbered consecutively, enclosed in parentheses, and positioned to the right along the final baseline of the equation. Do not include any ellipses (dots) from the equation to the equation number or any punctuation at the end of the equation itself. Use Equation Editor, rather than using carets (^) and underscores (_) to make a more readable equation.

Program Code:

Program listings or program commands in the text are normally set in typewriter font, e.g. Courier. Font size should not be less than 8.

```
program Inflation
    (Output)
    {Assuming annual inflation rates of 7%, 8%, and 10%,... years};
const MaxYears = 10;
var Year: 0..MaxYears;
    Factor1, Factor2, Factor3: Real;
```

References:

Within the text, references should be cited using endnotes in brackets. This can be done automatically by using the Insert: Reference: Footnote function and choosing Endnotes. The written text will look like this: *It was shown by Emam that the software cost decreases under these conditions [1]*. List and number all bibliographical references in 10-point Times, single-spaced, at the end of your report. References should be numbered in the order cited in the manuscript.

Journal papers:

Reference to journal articles, papers in conference proceedings or any other collection of works should include Names of author(s), Full names of the publication in which it appeared, Full title of the cited article, Year of publication, Volume number, and Page numbers. For example:

[1] D. E. Perry, and G. E. Kaiser, "Models of Software Development ", IEEE Trans. Software Eng., vol. 17, no. 3, pp. 283-295, Mar. 1998.

Textbooks:

Reference to textbook should include: Name of author(s), Year of publication, Full title of the publication, City of publication, Inclusive page numbers of the work being cited. For example:

[3] R. S. Pressman, "Software Engineering: A Practitioner's Approach", 4th Edition, New York: McGraw- Hill,1997.

Internet Site:

Reference to websites should include: Author name(s), if available, Title of page or subject, Web Address or URL, Date of webpage access. For example:

[4] Active directory Services, <http://www.microsoft.com/ads/default.htm>, Microsoft Corporation, accessed online on 13/1/2011.

Acknowledgement:

Acknowledgments may be made to individuals or institutions not mentioned elsewhere in the paper who have made an important contribution toward the completion of the project

Part Three: Appendix

IS 498 Syllabus

IS 498 Syllabus

Copyright Form

CLO Survey for IS 498

CLO Survey for IS 499

Exit Survey IS 499

Evaluation Forms

IS 498 Proposal Form

IS 498 Selection Form

King Saud University
College of Computer and Information Sciences
Department of Information Systems
Capstone project-I (IS 498) – (3-0-0)

Course Coordinator: B.Sc. Graduation Project Committee

Course Instructor: Multiple

Text Book(s): Information Technology Project Management, 7th Edition, by Kathy Schwalbe

Other References: Systems Analysis and Design in a Changing World 6th Ed, by Satzinger

Prerequisites: IS 230, IS 240, IS 324, IS 351

Co-requisite: Passing 95 Credit Hours

Course Type: Required

Course Description (catalog):

The courses studied so far have provided the IS students with strong and sufficient knowledge to develop information systems. The next logical stage is that the IS student must acquire hands-on experiences on developing real world information systems. In addition, the students should be familiarized with real world problems encounter during the development of real world information systems. Furthermore, the students should be trained to work in teams. In this course, the students will be organized into groups. The number of students in each group should be three students. In developing an information system, a particular system development methodology should be used. Each group will develop a real world information system in two stages: The first stage will be carried out in this course where students of each group must identify a problem domain, define a problem, identify the requirements in details, specify requirements in details, analyze and document the current system, proposed alternative systems, and design a particular system in details which includes the definitions of all the required system models such as the data model and the functional model. At the end of the course, each group must submit a formal report documenting the problem domain, the problem, the requirements, the specifications, and the system models.

Course Learning Outcomes (CLO): After completing this course, *the students will be able to:*

CLO code	Course Learning Outcomes
CLO ₁	Apply the knowledge of IS project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out
CLO ₂	Analyze a problem, find a solution, identify and define the functional and non-functional requirements appropriate to its solution
CLO ₃	Design a computer-based information system to meet the desired functional and non-functional requirements of the IS project
CLO ₄	Function effectively on project team to accomplish the project goals and meet its constraints
CLO ₅	Understand professional, ethical, legal, security, and social issues and responsibilities associated to the IS project
CLO ₆	Analyze the local and global impact of the IS project on individuals, organizations and society
CLO ₇	Recognize the need for engaging in professional PM organizations such as PMI and
CLO ₈	Use current techniques, skills and tools necessary for IS project management and system development, such as WBS, Gant Chart, Use Case Diagram, ER diagram, etc.
CLO ₉	Understand processes that support the delivery and management of IS such as system investigation, analysis, design, implementation and maintenance
CLO ₁₀	Communicate effectively with a range of audiences

Mapping CLOs with ABET SOs

#	CLOs	Student Outcomes									
		A	B	C	D	E	F	G	H	I	J
1	CLO1	x									
2	CLO2		x								
3	CLO3			x							
4	CLO4				x						
5	CLO5					x					
6	CLO6							x			
7	CLO7								x		
8	CLO8									x	
9	CLO9										x
10	CLO10						x				

Mapping CLOs with NCAAA PLOs

CLOs #	Program Learning Outcomes (PLO)									
	(Use PLO Code #s provided in the Program Specifications)									
	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	4.1	4.2
CLO1	x									
CLO2				x						
CLO3					x					
CLO4							x			
CLO5			x							
CLO6								x		
CLO7						x				
CLO8										x
CLO9		x								
CLO10									x	

Major Topics covered and schedule in weeks

List of topics	No. of Weeks	Contact hours
Problem Definition	2	6
Collect system requirements	3	9
System Analysis	4	12
System Design	4	12
Documentation	2	6

Assessment and Evaluation Criteria

Assessment task	Week Due	Proportion of Total Assessment	Evaluator
Assignments Completion, Interactive Discussions, Team working, and Meeting Attendance	weekly	60%	Instructor
Technical report	14th	15%	Examiner
Oral presentation	16th	25%	Examiner

The Examination Committee: By the end of week 14, the BSc project committee forms a number of examination committees based on the number of the completed projects. Each examination committee consists of three IS faculty members who evaluate a maximum of three projects and submit the result to the project committee. The examination committee member (examiner) should evaluate the students in each project based on **novelty, complexity, soundness, correctness** and **completeness** of their work as well as the **contribution of each individual student**. A student obtains the average of the marks given to him by the examiners.

The Technical Report: is a document in which the student describe the work done in the project and should contain the following sections:

- **Cover page** showing the title of the project, instructor name, and students' information
- **Table of Contents**
- **Abstract** description of the project
- **Introduction:** motivations, problem statement, scope and objectives
- **Methodology:** method used for System Development such traditional SDLC, agile, prototyping, etc, brief description of project phases such as System Investigation, System Analysis, System Design, System Implementation and Testing, and System Review and Maintenance
- **Project schedule:** Gant chart for the project
- **System Investigation:** Exploring the existing systems, define the problem, and collect required data
- **System Analysis:** find a solution, determine functional and nonfunctional requirements, and show the functional models such as use case diagram, sequence diagram. etc.
- **System Design:** decompose the system into its components, show how these components interrelated to each other and how they work together to achieve the solution proposed in system analysis, provide layout of the system, and show the necessary diagrams such as class diagram, ER diagram, class diagram, etc.
- Social, ethical, legal, global, and security impact of the project on the society
- **References**

The Oral Presentation: a 20 min power point presentation in which the students will have the opportunity to present their work and communicate orally with the examination committee to illustrate the merit of their project.

King Saud University
College of Computer and Information Sciences
Department of Information Systems
Capstone project-II (IS 499) – (3-0-0)

Course Coordinator: B.Sc. Graduation Project Committee

Course Instructor: multiple

Text Book(s): Information Technology Project Management, 7th Edition, by Kathy Schwalbe

Other References: Systems Analysis and Design in a Changing World 6th Ed, by Satzinger

Co-requisite: None

Course Type: Required

Course Description (catalog):

In this course, each group will continue developing the information systems that started in the capstone project I. Groups must use particular tools to implement their information systems in a good programming practice. These implementation tools must be new, up to date, and fully approved in IS design and implementation environment. Furthermore, students must generate user manuals for their information systems in an appropriate format. At the end of the term, each group must submit a final report, which documents completely the information system, from the problem definition phase to the implementation phase, and contains a user manual for the information system.

Course Learning Outcomes (CLOs): After completing this course, *the students will be able to:*

CLO code	Course Learning Outcomes
CLO1	Apply the knowledge of IS project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out
CLO2	Design a computer-based information system to meet the desired functional and non-functional requirements of the IS project
CLO3	Function effectively on project team to accomplish the project goals and meet its constraints
CLO4	Understand professional, ethical, legal, security, and social issues and responsibilities associated to the IS project
CLO5	Analyze the local and global impact of the IS project on individuals, organizations and society
CLO6	Recognize the need for engaging in professional PM organizations such as PMI and
CLO7	Use current techniques, skills and tools necessary for IS project management and system development, such as WBS, Gant Chart, Use Case Diagram, ER diagram, etc.
CLO8	Understand processes that support the delivery and management of IS such as system investigation, analysis, design, implementation and maintenance
CLO9	Communicate effectively with a range of audiences

Mapping CLOs with ABET SOs

#	CLOs	Student Outcomes									
		A	B	C	D	E	F	G	H	I	J
1	CLO ₁	x									
3	CLO ₂			x							
4	CLO ₃				x						
5	CLO ₄					x					
6	CLO ₅							x			
7	CLO ₆								x		
8	CLO ₇									x	
9	CLO ₈										x
10	CLO ₉						x				

Mapping CLOs with NCAAA PLOs

CLOs	Program Learning Outcomes (PLO)									
	(Use PLO Code #s provided in the Program Specifications)									
	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	4.1	4.2
CLO ₁	x									
CLO ₂					x					
CLO ₃							x			
CLO ₄			x							
CLO ₅								x		
CLO ₆						x				
CLO ₇										x
CLO ₈		x								
CLO ₉									x	

Major Topics covered and schedule in weeks:

List of Topics	No. of Weeks	Contact hours
System Implementation	6	18
System Testing	6	18
Documentation	3	9

Assessment and Evaluation Criteria

Assessment task	Week Due	Proportion of Total Assessment	Evaluator
Assignments Completion, Interactive Discussions, Team working, and Meeting Attendance	weekly	60%	Instructor
Final report	14th	12%	Examiner
Oral presentation	16th	28%	Examiner

The Examination Committee: By the end of week 14, the BSc project committee forms a number of examination committees based on the number of the completed projects. Each examination committee consists of three IS faculty members who evaluate a maximum of three projects and submit the result to the project committee. The examination committee member (examiner) should evaluate the students in each project based on *novelty, complexity, soundness, correctness* and *completeness* of their work as well as the *contribution of each individual student*. A student obtains the average of the marks given to him by the examiners.

The Final Report: is a document in which the students describe the work done in the project and should contain the following sections:

- All sections in IS 498 report after modifications
- Required HW and SW resources.
- Description of proposed implementation and testing plan.
- Testing results.
- Lessons learned and professional growth effects of the project on the team members
- Conclusion and future work that can be done on the project.
- Updated reference list.

The Oral Presentation: a 20 min power point presentation in which the students will have the opportunity to present their work and communicate orally with the examination committee to illustrate the merit of their project.

Copyright Form

Project Title: _____

Term of the Project: (1st/2nd Semester)_____ Academic Year _____

We the team (Team Members Names):

	Member Name	Member ID #	Member Signature
1			
2			
3			

Hereby assign our copyright of this report and of the corresponding executive summary to the Information System (IS) Department of King Saud University. We also hereby agree that the report or demo from our oral presentations is becoming full property of the IS Department. Publication of this report does not constitute approval by King Saud University, the IS Department or its faculty members of the findings or conclusions contained herein. It is published for the exchange and stimulation of ideas.

CLO Survey for IS 498

CLO #	SO	CLO --- I am able to:	1	2	3	4	5
1	A	Apply the knowledge of project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out					
2	B	Analyze a problem, find a solution, identify and define the functional and non-functional requirements appropriate to its solution					
3	C	Design a computer-based information system to meet the desired functional and non-functional requirements of the IS project					
4	D	Function effectively on project team to accomplish the IS project goals and meet its constraints					
5	E	Understand professional, ethical, legal, security, and social issues and responsibilities associated to the IS project					
6	G	Analyze the local and global impact of the IS project on individuals, organizations and society					
7	H	Recognize the need for engaging in professional PM organizations such as PMI and PRINCE2					
8	I	Use current techniques, skills and tools necessary for IS project management and system development, such as WBS, Gant Chart, Use Case Diagram, ER diagram, etc.					
9	J	Understand processes that support the delivery and management of IS (e.g., system analysis, design, implementation, etc.) within a specific application area					
10	F	Communicate effectively with a range of audiences					

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

CLO Survey for IS 499

CLO #	SO	CLO --- I am able to:	1	2	3	4	5
1	A	Apply the knowledge of project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out					
2	C	Implement and test a computer-based information system to meet the desired functional and non-functional requirements of the IS project					
3	D	Function effectively on project team to accomplish the IS project goals and meet its constraints					
4	E	Understand professional, ethical, legal, security, and social issues and responsibilities associated to the IS project					
5	G	Analyze the local and global impact of the IS project on individuals, organizations and society					
6	H	Recognize the need for engaging in professional PM organizations such as PMI and PRINCE2					
7	I	Use current techniques, skills and tools necessary for IS project management and system development, such as WBS, Gant Chart, Use Case Diagram, ER diagram, etc.					
8	J	Understand processes that support the delivery and management of IS (e.g., system analysis, design, implementation, etc.) within a specific application area					
9	F	Communicate effectively with a range of audiences					

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Exit Survey for IS 499

We are required to assess how effectively the program outcomes have been achieved and our degree program prepared graduates for the Information Systems profession. For each of the following statements, please select one of the following categories: strongly agree, agree, Neutral, disagree, and strongly disagree.

I. Course learning outcomes evaluation

Please rate the degree of Satisfaction and the extent to which each course of your program's curriculum is helping you in your professional career.

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
IS 201	Basic concepts on Managing and controlling IS (G)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 224	Object-oriented concepts (B)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 230	Basics and concepts of database systems (J)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 240	Broad understanding of organizations, organizational culture, and organizational operations and a sense of continuing personal development, ethics and respect for and collaboration with the work of others. (E)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 240	Methodologies and techniques for IS process and data modeling (B)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 324	Programming with VB under .Net technology. (C)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 335	Transaction management, concurrency and recovery of a database. (A)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 351	Project management and it Applying to information technology projects that good planning makes to project success. (C)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 362	Definition of mathematical modeling methods and techniques and Linear programming (C)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 370	Definition of computer network (A)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 370	Ability to communicate ideas of the course by presenting a small research work. (F)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 385	How business processes are integrated in an ERP system. (J)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 385	Ability to conduct a presentation in ERP area. (D)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 482	E-Business concepts (I)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 493	How to design and implement security solutions to protect information. (I)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 498	Recognize and engage in learning new tools if needed to develop the project. (H)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IS 499	Knowledge to manage and deliver system user manual and system installation. (J)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

II. Curriculum evaluation

Please rate the degree of Satisfaction and the extent to which each component of your program's curriculum is helping you in your professional career.

1. To what extent do you agree/disagree with the following statements about your graduate program?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. My program has high academic standards.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. My program integrates current developments in my field.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. My program prepared me well for my profession.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. My program was intellectually challenging and stimulating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I would recommend my graduate program to forthcoming students.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. If I were starting over, I would enroll in this program again.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. My program encourages student collaboration and teamwork.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. My program encourages student collaboration and teamwork.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. I am satisfied with the education I received regarding the following curriculum components:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. Math & Basic Sciences courses : (Integration Math - Introduction to Mathematics - Differentials - Discrete Math)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Basic Science courses : (General Chemistry I - General Chemistry Lab - General Biochemistry - General Physics II for Engineering)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. General education courses : (Learning, Thinking, and Research - Health and Fitness - IT Skills - EnglishI - EnglishII - Introduction to Islamic Culture- Islam and Society-Economic System in Islam - Fundamentals of Islamic Policies system - Communication skills - Entrepreneurship)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. IS core courses : (Computer Programming –I - Computer Programming –II - Data Structures - Operating systems Fundamentals & Ethics of Information Systems - Visual Programming - Introduction to Database Systems - Information Systems Analysis & Design -Modern application Development - Database Management Systems - Information Systems Project Management - Data Communications and Computer Networks - Enterprise Resource Planning Systems)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Advanced-level courses of the IS program : (Electronic Business - Information Security- Capstone Project-I - Capstone Project-II - Practical Training (Internship))	<input type="checkbox"/>				
6. Elective courses possible to IS students : (Data & Knowledge Management courses - Electronic and Enterprise Applications courses - IS Modeling Techniques courses)	<input type="checkbox"/>				
7. IS Environment Courses : (Accounting principles I - Principles of Finance - Principles of Management and Business - Organizational Behavior - Managerial Skills)	<input type="checkbox"/>				
8. Quantitative analysis courses : (Probability & Statistics for Engineering Mathematical Modeling for IS)					

III. Learning environment evaluation

- To what extent do you agree/disagree with the following statements about faculty in your graduate program?

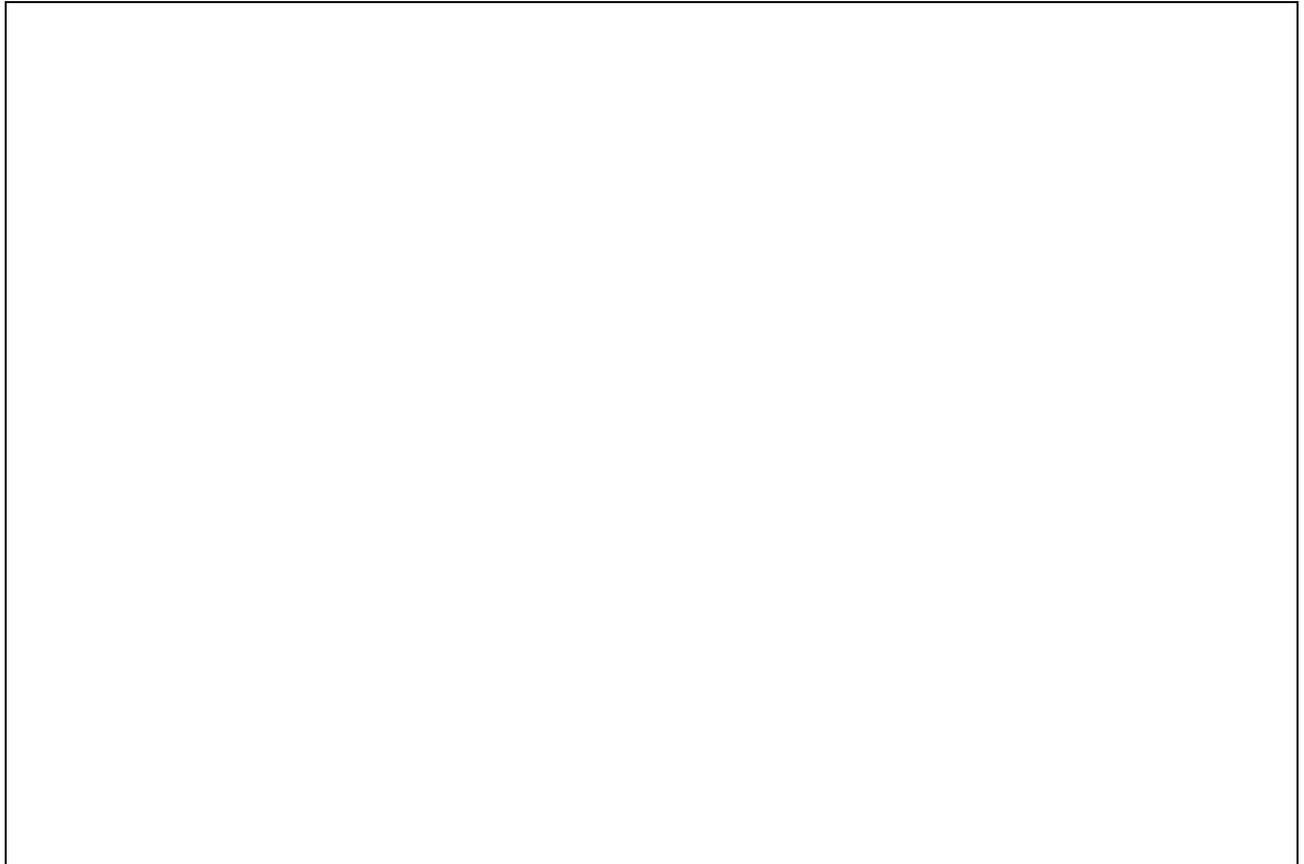
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. Academic advising was appropriate and helpful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The courses I took were taught well.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. There is good communication between faculty and students regarding student needs, concerns, and suggestions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. There are many opportunities outside the classroom for interaction between students and faculty.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Faculty in my department are interested in the professional development of graduate students.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Faculty in my department are well qualified to teach their courses.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Faculty in my department were willing to meet with me to discuss my academic performance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- How satisfied are you with the following aspects of your graduate program?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1. Laboratories were adequately equipped (discipline specific software and equipment)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The learning resources (textbooks, ...) were available and suitable at different levels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The library was adequately supplied with books related to the program's curriculum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Social space on campus was available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IV. General comments and suggestions

Please comment on any aspects of your IS degree that you think are relevant.

A large, empty rectangular box with a thin black border, intended for students to provide general comments and suggestions regarding their IS degree. The box is currently blank.

IS 498 – Advisor's Evaluation Form

Project Title		Section #	
S1	First Student		Final mark (Out of 60)
	Student ID		
S2	Second Student		Final mark (Out of 60)
	Student ID		
S3	Third Student		Final mark (Out of 60)
	Student ID		

Criterion	Max score	Advisor score		
Group Evaluation Items				
Completion of all project requirements (functional and non-functional requirements).	10			
Clear and complete description and presentation of the proposed system.	10			
Quality (logical and correctness) of the proposed system.	10			
Difficulty and size of work.	6			
Overall quality of the project report.	4			
Group Subtotal	40			
Individual Student Evaluation Items *		S1	S2	S3
Contribution to team work and cooperation with fellow students and advisor.	10			
Creativity and independent work in solving problem and overcome faced obstacles.	5			
Attendance to project meetings.	5			
Individual Subtotal	20			
Grand Total	60			

Advisor Name	
Comments	
Date	
Advisor Signature	

IS 498 – Examiner Evaluation Form

Project Title		Section #	
S1	First Student		Final mark (Out of 40)
	Student ID		
S2	Second Student		Final mark (Out of 40)
	Student ID		
S3	Third Student		Final mark (Out of 40)
	Student ID		

Section1: Project Report: Please evaluate each section in the project report according to clearness, completeness and consistency**.

Criterion	Max. score	Examiner score
Report Evaluation Items		
Organization of report (title page, abstract, table of contents, reference list, ...)	2	
Introduction, motivations, objectives and literature review	2	
Description of proposed project functional and nonfunctional requirements	3	
Usage of project particular management tools such as Gantt chart, WBS, etc.	1	
Following of particular information system development methodology such as SDLC, agile, etc.	1	
Usage of diagrams such as ER, use case, class diagram, etc.	6	
Report Subtotal	15	

Section2: Project Presentation

Criterion	Max score	Examiner score
Group Presentation Evaluation Items		
Completion of all project requirements (functional and non-functional).	4	
Professional (clear, complete and consistence) presentation of the proposed system.	4	
Quality (logical and correctness) of the proposed system.	7	
Difficulty and size of the work.	5	
Group Subtotal	20	

Individual Student Presentation Evaluation Items *		S1	S2	S3
Student presentation Skills (every student has to present).	2			
Ability of student to answer questions about the analysis and design of the system (every student has to be asked at least one question).	3			
Individual Subtotal	5			
Grand Total	40			

Examiner Name	
Comments	
Date	
Examiner Signature	

* Individual student evaluation item may be different for each student group member.

** The report structure:

- Title page (includes the names, emails and student Identification numbers).
- Table of contents, table of tables, and table of figures pages.
- Project Abstract
- Introduction
- Objectives and motivations
- Time and resource schedule using project management tool such as the Gantt chart covering requirements of the project 1.
- Review of the literature/survey for existing solutions if applicable (commercial and noncommercial)
- In developing an information system, a particular information system development methodology should be used such as traditional SDLC or agile etc.
- Definition of positional users in order to conduct data gathering and system testing later in IS 499. Students are required to show how they collect the data.
- Detailed description of proposed project functional and nonfunctional requirements.
- Description of proposed project analysis and design). Students **must include** the following analysis and design tools:
 1. The use case diagram and use case scenario/description.
 2. The logic diagram of use cases using Unified Modeling Language (UML) Activity Diagram (UML ADs), Business Process Modeling and Notation (BPMN2.0), or similar tool.
 3. The ER diagram and rational schema.
 4. The Sequence Diagram
 5. The class diagram.
- Reference list.

IS 499 – Advisor's Evaluation Form

Project Title		Section #	
S1	First Student		Final mark (Out of 60)
	Student ID		
S2	Second Student		Final mark (Out of 60)
	Student ID		
S3	Third Student		Final mark (Out of 60)
	Student ID		

Criterion	Max score	Advisor score		
Group Evaluation Items				
Completion of implementing all system requirements.	7			
Quality of system implementation and coding.	10			
Completion and correctness of system testing.	7			
Difficulty and size of the work.	7			
Clearness of future work.	2			
Clearness, completeness, and consistency of reporting project 2 section. **	7			
Group Subtotal	40			
Individual Evaluation Items *		S1	S2	S3
Contribution to team work and cooperation with fellow students and advisor.	10			
Creativity and independent work in solving problem and overcome faced obstacles.	5			
Attendance to project meetings.	5			
Individual Subtotal	20			
Total	60			

Advisor Name	
Comments	
Date	
Advisor Signature	

IS 499 – Examiner's Evaluation Form

Project Title		Section #	
S1	First Student		Final mark (Out of 40)
	Student ID		
S2	Second Student		Final mark (Out of 40)
	Student ID		
S3	Third Student		Final mark (Out of 40)
	Student ID		

Section1: Project Report: Please evaluate each section in the report according to **clearness, completeness and consistency.**

Criterion	Max. score	Examiner score
Report Evaluation Items		
Refinements performed on Project 1 report based on Project 1 discussion committee, and lessons learned and professional growth impacts of the project on the team members.	3	
Description of SW and HW used in implementation.	2	
Description of testing methodology.	2	
Description Social, ethical, legal, global, and security impact of the project on the society.	1	
Conclusion and future work.	1	
Sample code, user manual, and snapshots.	3	
Report Subtotal	12	

Section2: Project Presentation

Criterion	Max score	Examiner score
Group Evaluation Items		
Completion of implementing all system requirements (through full demo).	5	
Completion and correctness of system testing (through full demo)	7	
Showing the quality of the code (are they following the coding best practice).	2	
Difficulty and size of the work.	5	
Clearness of future work.	1	
Group Subtotal	20	

Individual Evaluation Items *		S1	S2	S3
Student presentation Skills (every student has to present).	2			
Answering questions about the coding of the system (every student has to be asked at least one question).	2			
Answering questions about the design and architecture of the system (every student has to be asked at least one question).	2			
Answering questions about challenges and lessons learned during the implementation of the system (every student has to be asked at least one question).	2			
Individual Subtotal	8			
Grand Total	40			

Examiner Name	
Comments	
Date	
Examiner Signature	

* May be different for each individual student group member.

** The project report structure:

- Report all refinements performed to the system analysis and design conducted in Project I (this includes any changes that have been done to any diagrams in IS 498); justifying these changes should be described.
- Required HW and SW resources.
- Description of proposed project implementation, and testing.
- Testing plan and its results.
- Optionally, student may choose 2-4 use cases and implement them
- Social, ethical, legal, global, and security impact of the project on the society
- Lessons learned and professional growth impacts of the project on the team members
- Conclusion and future work that can be done on the project.
- Sample code for the selecting programming language
- System installation and simple user manual for the proposed system
- Snapshots of main execution screens of the developed system
- Updated reference list.

IS 498 Proposal Form	
Project #	(DO NOT GIVE NUMBER; THE COMMITTEE WILL DO)
Instructor Name	
Project Title	
Project Description and Scope	
Main goals	
Main clients	
Main functional requirements	
Required Skills and Knowledge	
Project Committee Decision	Accept Reject Need Modification
Committee Comments	

IS 498 Selection Form

Group Information

No.	Student ID	Student Name	GPA
1			
2			
3			

Ordered Choices

No.	Instructor Name	Project Number
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Committee Decision