

جامعة الإمام محمد بن سعود الإسلامية
كلية الهندسة

Al Imam Mohammad Ibn Saud Islamic University
College of Engineering



دليل مشاريع التخرج

GRADUATION PROJECT GUIDELINES

1434/2013

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Preface

All praise and thanks are due to Allah Subhanahu wa Taala and peace and blessings of Allah be upon Prophet Muhammad Sallallahu Alaihay Wassallam.

In pursuit of excellence and higher quality education here in the College of Engineering at Al Imam Mohammad Ibn Saud Islamic University, a new set of standards had to be established and followed strictly by all members of our college faculty. Additionally, such action will certainly reduce variances in the criteria enforced upon our college educational requirements, and eliminate the chances of diverting from the preset and pursued level of quality.

Within the context of this effort, a committee was set-up to review in details the guidelines of the students' graduation projects during the Bachelor's degree, and eventually summarize these guidelines in a standardized form within an all-inclusive booklet. The outcome of this work has also been praised and approved by the council of the College of Engineering during the second semester of 2013.

It is expected that all of our graduating students, their project advisors, and examining committees will keenly adopt and follow this set of guidelines. Definitely, we will notice the fruitful outcomes of these efforts within the next few years when such quality standards became embedded in our college culture.

Beyond doubt, the guidance and the unquestionable support we experience in the College of Engineering from our university higher administration, especially from His Excellency - Prof. Sulaiman Abdullah Aba Al-Khail - the President of the University, provide us with the desire to achieve more. The college values this support as it is crucial for its development and in attaining the high standards that it has set for itself.

Prof. Abdullah Ibrahim Almarshad

Dean, College of Engineering

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INTRODUCTION

These graduation project guidelines are prepared in order to aid the student as he prepares for his graduation project at the College of Engineering at Al Imam Mohammad Ibn Saud Islamic University. The idea behind this work is to develop a standardized approach to the graduation project, where students, supervisors and examiners follow a unified graduation project outline, syllabus and evaluation. The objective of the graduation project is to enrich the student's knowledge by allowing him to apply his acquired undergraduate experiences and engineering skills. The cumulative student's education in science courses, engineering courses, labs and practical training, will be reflected in their graduation project and will prepare the student for a professional career after graduation. Graduation Project I is a one-semester course of one credit hour while Graduation Project II is a one-semester course of three credit hours. A list of graduation projects offered by faculty members from each engineering department will be posted at the beginning of the fall semester, and will include a brief description of each project. The College of Engineering encourages teamwork; but maximum number of student per each project must not exceed 2. The faculty member (supervisor) role is to guide the students throughout the entire length of the project.

One of the graduation project objectives is to help graduating engineers finding a future career. Hence, it is recommended that the graduation topic be related to the needs of the country and development plan. Students should not select a graduation project that was undertaken by previous students. Students are strongly advised to select new project topics, not repeat topics.

The graduation project can serve as an excellent reference for graduating students as part of the job interview process. Hence, students should produce a high

quality project by using their engineering and collaborative skills. It is essential that students meet their advisor regularly and follow project guidelines.

REGULATIONS

1. Graduation committee: Each department must form a graduation project committee. The duties of the committee are as follows:
 - Ensure the implementation of the graduation project guidelines and regulations.
 - Announce the graduation project topics at the beginning of the first semester.
 - Receive the final draft of the project according to the deadlines announced by the department.
 - Arrange the schedule for the final exam presentation in coordination with the advisors, the examiners and the students.
 - Prepare the evaluation forms and obtain the final grades from the advisor and examiners.
2. Advisor: The advisor must hold a Ph.D degree and be a full time faculty member.
3. Examiners: Must hold a Ph.D degree and in the same engineering field.
4. Students: The students must complete the prerequisite for this course and currently enrolled in the 7th semester. Number of students in a group, per project, must not exceed two.
5. Graduation Project I& II. Graduation Project II must be a continuation of Graduation Project I unless the student secures a departmental exception.

6. Course grade: Evaluation and students grade is shown on page 11 through 13, student will not pass this course if he fails to complete any part of the project (i.e. calculation, report writing or not attending the presentation).
7. Graduation project type: The graduation project can take different forms. Students can choose from one of the following graduation project types:
 - Experimental studies
 - Numerical, Modeling or simulation studies
 - Investigation and field studies

PROJECT STEPS

1. Project selection: Faculty members from each department will post a one-page description of suggested graduation projects topics after departmental approval. Each group of students should choose a project topic from the list posted from their department. If a student or a group of students or a company suggests a project idea to the department, then an advisor may accept the project after department approval.
2. Work distribution: The group members are responsible for all the project work. In order to ensure an equitable distribution of the project load, the supervisor will assign each member a specific part of the project load.
3. Regular advisor weekly meeting: Weekly meetings with the advisor are scheduled, with the number of meetings based on the credit hours for this course. Work completed by the group should be signed and submitted to the advisor for review. Students should not delay writing the report to the end of the semester and corrections made by the advisor should be printed immediately according to report writing guidelines.

4. Progress report : By the mid of the semester, a progress report or presentation to the advisor should be performed in order to show what has been accomplished and indicate the remaining tasks.
5. Draft of final report submission (14th week): A draft of the final report must be submitted a week before the final exam. Students should plan to finish the report before the exams start. Additionally, the advisor and the examining committee will have time to grade the report prior to final exams.
6. Final project presentation (15th week of the 2nd semester): Each department will announce the date for the final oral examination of the graduation project. It is recommended to schedule the examination the week prior to final exam.
7. Final project report submission. The report should be written according to the format shown in the Graduation Project Report Format. As the project defense and semester final exams are completed, students are required to edit and incorporate comment suggested by the supervisor and examiners. After corrections are completed, students must submit the final report to the department as part of their graduation requirement.

Report Copies for examination committee

Two Copies of the final draft of the report must be submitted to the advisor and the examiner on the 15th week. Advisor and examiner will write their comments on the draft report. Students are required to do the corrections and submit the final report to the department.

Faculty load for graduation project supervision

The faculty load for project supervision is as follow:

Project	Load per each project
---------	-----------------------

Graduation Project I	1 Credit Hours
Graduation Project II	2 Credit Hours
If a faculty member supervise more than 3 projects, then load will account only for 3 project	

Report Order and Contents

1. Preliminary Pages

- Title (Cover) Page : The first page of the report (not to be numbered) should include the following; University, College ,Department, Project Title, Student and Supervisor Names and Date (See cover page sample)
- Abstract (maximum of one page):(In the abstract, students should introduce the problem, state the approach and scope of the work, and summarize the findings of the project. Reports submitted by multiple students should include a paragraph in the abstract that clearly specifies the author of each section of the report .
- Dedication (optional)
- Acknowledgment(optional): A student can acknowledge those who contributed towards the accomplishment of his project work .
- Table of Contents: In this table, the contents of the report with respective page numbers must be listed .
- List of Figures: In this section, title/caption of all figures in the report are to be listed together with respective page numbers .
- List of Tables: In this section, title of all tables in the report are to be listed together with corresponding page numbers .
- Nomenclature: In this section, all symbols used in the text must be properly defined including the units.

2. Report Chapters

The chapters to be included in the report are as follows :

- Chapter 1: Introduction which includes background, statement of the problem, objectives, scope of investigation and method of approach.
- Chapter 2: Literature survey, process description, methods and technology application, etc.

- Chapter 3: This is the main body of the report which should include the Design/Design of Experiment/Software Development/Mathematical Model.
- Chapter 4: Results and Discussions
- Chapter 5: Conclusions and Recommendations. Includes the summary of the work done, problems faced, lessons learned, and suggestions for future work .

3. References

The academic style in-text citation and references should follow the MLA or Chicago Manual of Style format. A sample of references from AICHE is listed below: From the *CEP Reference Style Guide* of the AIChE

General Style:

Information appears in the following general order: author, title, publisher, page numbers, and date. Individual elements of the citation are separated by commas, and a period is used at the end. If there are more than two authors, list only the first author followed by et al. The specific information that should be included depends on the type of reference.

Periodical: Author's last name and initials in bold, title of article in quotation marks, title of periodical in italics (underline if italics are not available), volume number in bold, issue number in parentheses, page numbers (inclusive), date in parentheses.

Book: Author's last name and initials in bold, title of book in quotation marks, edition number if appropriate, publisher's name, city and state of publisher, page numbers (inclusive, unless entire book is being referenced), date in parentheses.

Sample Citations:

1. **Schaich, J. R.**, "Estimate Fugitive Emissions from Process Equipment," Chem. Eng. Progress, **87** (8), pp. 31-35 (Aug. 1991).

2. **Homoki, G. G., and K. N. Vernekar**, "Materials Selections for Sludge Incinerator Heat Exchangers," in "Materials Performance in Waste Incineration Systems," G. Y. Lai and G. Sorell, Eds., NACE International, Houston, TX, pp. 20-1 to 20-8 (1992).

3. **Perry, R. H., and D. W. Green, Eds.**, "Mass Transfer and Gas Absorption," Chapter 14, in "Perry's Chemical Engineers' Handbook," 6th ed., McGraw-Hill, New York (1984).

4. **AIChE Center for Waste Reduction Technologies**, "Current and Potential Future Industrial Practices for Reducing and Controlling Volatile Organic Compounds," AIChE, New York, pp. 37-44 (Sept. 1992).

5. **Trebilcock, R. W., et al.**, "Reduction of Distillation Waste Streams," presented at the AIChE Summer National Meeting, Seattle, WA, Paper No. 5b (Aug. 1993).

6. **Kuhn, L. A., and E. N. Ruddy**, "Comprehensive Emissions Inventories for Industrial Facilities," Proceedings of the Air and Waste Management Association's 85th Annual Meeting and Exhibition, Kansas City, MO, Paper No. 92-139.12 (June 1992).

7. **U.S. Environmental Protection Agency**, "Compiling Air Toxics Emissions Inventories," U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC, EPA/450/4-86-010, NTIS No. PB86-238086 (July 1986).

8. "The Abnormal Situation Management Joint Research and Development Consortium," available via <http://www.iac.honeywell.com/Pub/Tech/asmwww/html> on the WWW.

4. Appendices

In this section include additional materials such as data sheets, program listings, mathematical derivation, sample calculations, etc.

Graduation Project Report Format

Typeface:	Chapter title font size	14 bold, all capital
	Section font size	12 bold, all capital
	Sub-section font size	12 bold, word first letter capital
	Text font size	12 Times New Roman

Page Margins: Left, Right, Upper, and Lower Margins: 1 inch each .

Line Spacing: Line spacing of 1.5 is required in the main body of the manuscript and single spacing for footnotes, indented quotations ,tables, etc .

Language: The report must be in English.

Paper: All copies must be on white, A4 or letter-size paper

Pagination: Each page of the manuscript, including all blank pages, and pages with photographs, tables, figures, maps, and computer program printouts should be assigned a number. Consistent placement of pagination, at least one inch from the paper's edge

The following pagination plan may be used :

- For the preliminary pages, use small Roman numerals (i, ii, iii, iv, etc.). The title page does not have a number but counts as page i.
- For the remainder of the manuscript use continuous pagination for text, illustrations, appendices, and bibliography- use Arabic numbers (1,2, 3, etc.).
- Figures, tables and other illustrations should be titled as well as numbered (example- Table 1 “The title of the Table”).

Photographs, Maps, and Charts: Large maps and charts should be avoided. Where necessary, they must be folded to 10.5 x 7.5 inches or smaller; they should be in pockets in the bound reports

Reproducing the Report: Three copies with original advisor and examiner's signatures should be submitted to the department chair. A soft copy of the project should also be submitted in an envelope attached to the back cover of each copy.

Cover Page: Sample of cover page is shown on next page.

SAMPLE COVER PAGE:

Ministry of Higher Education



**Al Imam Mohammad Ibn Saud Islamic University
College of Engineering
Chemical Engineering Department**

Project Title

By

First Name Initial Last Name (ID #)

First Name Initial Last Name (ID #)

Supervised by

Dr.

**Submitted in partial fulfillment of the requirements of B.Sc. Degree in Chemical
Engineering**

May 2014

GRADUATION PROJECT EVALUATION

The graduation project is evaluated by the project advisor and examiners. Number of examiners should not exceed three Ph.D. faculties from the same department, where the final project's grade consists of the averaged total grades obtained from the examiners. The basis of the evaluation is as follows:

Students Name: Student ID#:			
Topics	Advisor	Examiners	Total
Supervision	30%	-	30%
Report	20%	20%	40%
Presentation	15%	15%	30%
Total	65%	35%	100%

The evaluation outcome of the examining committee should be approved by the department head and the dean of the college.



Al Imam Mohammad Ibn Saud Islamic University

Department of _____

Examiner Evaluation Form, College of Engineering,

Student Name: _____ **Student ID#:** _____

Project Title: _____

Advisor Name: _____

Topics	Points
---------------	---------------

Written Report [40%]:

Overall Organization. ___/2.5

English: [Grammar/ spelling/ formatting] ___/2.5

Technical Content:

• Abstract/ Introduction/ literature survey. ___/2.5

• Calculation/design/experimental data/modeling. ___/5.0

• Results and discussion ___/5.0

• Conclusions/Recommendation/Ethics principles and citation. ___/2.5

TOTAL [___/20]

Oral Presentation [30%]:

Clarity of Presentation. ___/2.5

Technical Content: ___/5.0

Presentation Skills: ___/2.5

Discussion: [Participated in question answering/ interactive]. ___/5.0

TOTAL [___/15]

EXAMINER TOTAL GRADE [___/35]

Examiner Name: _____ **Signature:** _____

Date: _____



Al Imam Mohammad Ibn Saud Islamic University

Department of _____

Supervisor Evaluation Form, College of Engineering

Student Name: _____ **Student ID#:** _____

Project Title: _____

Topics Points

Supervision [/30]

This is based on overall student participation in weekly meeting, literature survey, calculation, ideas and discussion, data collection and analysis, participation in team work and cooperation with colleagues and advisor. Also, student absence should be taken into account

Written Report [40%]:

Overall Organization ___/2.5

English: [Grammar/ spelling/ formatting] ___/2.5

Technical Content:

- Abstract/ Introduction/ literature survey. ___/2.5
- Calculation/design/experimental data/modeling. ___/5.0
- Results and discussion ___/5.0
- Conclusions/Recommendation/Ethics principles and citation ___/2.5

TOTAL [___/20]

Oral Presentation [30%]:

Clarity of Presentation ___/2.5

Technical Content: ___/5.0

Presentation Skills: ___/2.5

Discussion: [Participated in question answering/ interactive]. ___/5.0

TOTAL [___/15]

SUPERVISOR TOTAL GRADE [___/65]

Supervisor Name: _____ **Signature:** _____

Date: _____



Al Imam Mohammad Ibn Saud Islamic University
College of Engineering
Anti-Plagiarism Declaration

This is to declare that the graduation project, produced under the supervision of Dr. _____, and having the title “ _____ ” is the sole contribution of the student(s) named below and no part hereof has been reproduced illegally (in particular, cut and paste) which can be considered plagiarism. All referenced parts have been used to support and argue the ideas herein, and have been cited properly. I/we certify that I/we did not commit plagiarize, cheat, and upheld the principles of academic honesty. I/we are responsible and liable for any consequences, if violation of this declaration is proven.

Date: _____

Student Name: _____ **Signature:** _____

Sample of Syllabus Prepared for a Design Project



Al-Imam Muhammad Ibn Saud Islamic University
College of Engineering
Department of Chemical Engineering
Graduation Project
1434 /1435

Course Information	
Course Code, Number & Name	CHE 491
Prerequisite/s	Department Approval
Time, Days & Hall	TBA
Instructor	TBA
Office, Tel & e-mail	TBA
Office Hours	TBA
Teaching Assistant	-TBA

Course Description: from the College Catalog
<p>The student chooses a specific problem in engineering and tackles it through design. Flow sheet, material and energy balances, process and site selection analysis.</p> <p>Perform studies that involve applications of chemical engineering principles to the design of a selected chemical manufacturing process, design information and data, flow sheeting, market survey, processes and process selection, material and energy balances, site location and plant layout. Capacity determination. Literature survey. Preparation of set-up for practical projects.</p>

Course Objectives:
<p>After completing this course, students will:</p> <ul style="list-style-type: none"> • Be knowledgeable about the kinds of design decisions that challenge process design teams • Have an appreciation of the key steps in carrying out a process design • Be familiar with the more widely used industrial separation methods • Understand degrees of freedom in modeling process units and flow sheets, and be able to make design specifications and follow the iterations implemented to satisfy them • Demonstrate the ability to write a technical report and make an oral presentation • Demonstrate an understanding of the professional work environment

Teaching & Learning Methods
Lectures, group meeting, and computer aided design applications (ChemCAD)

Textbook	
Title	No textbook, advisor lectures and meetings

Useful Resources	
<ol style="list-style-type: none"> 1. Geankoplis C.J. "Transport Processes and Separation Process Principles", 4th edition, Prentice Hall, 2003. 2. Coulson J.M., Richardson J.F., Backhurst J.R. and J.H. Harker "Chemical Engineering; Volume 2", 4th Ed., Butterworth Heinemann, 1991. 3. Perry J. H. (ed.) "Chemical Engineers' Handbook", 6th edition, McGraw-Hill, 1984. 4. Foust A.S., Wenzel L.A., Clump C.W., Maus L. and L. B. Andersen "Principles of Unit Operations" , 2nd edition, Wiley, 1980. <p>Other resources</p> <ul style="list-style-type: none"> • Chemical Engineering Magazine • Powder Technology • Powder and Bulk Engineering (http://www.powderbulk.com) 	

Course Evaluation			
Students Name:		Student ID#:	
Topics	Advisor	Examiners	Total
Supervision	30%	-	30%
Report	20%	20%	40%
Presentation	15	15	30%
Total	65%	35%	100%

Policy	
Attendance	Regular attendance is expected. Student should notify the instructor of any planned absence. University regulations regarding absence will be strictly applied.
Students Conduct	Students should adhere to academic integrity and ethics. Cheating is absolutely not tolerated. University regulations will be enforced and applied to any student cheats, or attempts to.
Student Work	Will be assigned with their due times during lectures. Late work will not be accepted. All student work will be corrected, graded, handed back, and discussed further in the class upon their return.

Note: Any change in this form requires the approval of the **College Council**

Sample of Syllabus Prepared for a Experimental/Modeling/Simulation/Investigation Project



**Al-Imam Muhammad Ibn Saud Islamic University
College of Engineering
Department of Chemical Engineering
Graduation Project
1434 /1435**

Course Information	
Course Code, Number & Name	CHE 491
Prerequisite/s	Department Approval
Time, Days & Hall	TBA
Instructor	TBA
Office, Tel & e-mail	TBA
Office Hours	TBA
Teaching Assistant	-TBA

Course Description: from the College Catalog
The student chooses a specific problem in chemical engineering and tackles it experimentally or theoretically. The topics covered in Research Projects option will vary from one group to another, typical content would include: Literature survey, Description of experimental procedure, Modeling and simulation, Experimental results, Sensitivity study, Discussion of results.

Course Objectives:
After completing this course, students should be able to: <ul style="list-style-type: none"> • Be knowledgeable about the experimental research area performed in this project • Understand research methodology • Be familiar with data analysis and data interpretation • Understand mathematical modeling/simulation or statistical analysis for experimental data • Demonstrate the ability to write a technical report and make an oral presentation

Teaching & Learning Methods
Lectures, group project meeting and computer application

Textbook	
Title	No textbook, advisor lectures and meetings

Useful Resources

- Books related to the research or simulation area
- Journals related to project topic
- Standard testing method i.e., ASTM
- Internet

Course Evaluation

Course Evaluation			
Students Name:		Student ID#:	
Topics	Advisor	Examiners	Total
Supervision	30%	-	30%
Report	20%	20%	40%
Presentation	15	15	30%
Total	65%	35%	100%

The main topics to be covered in the report

Introduction
Background and literature survey
Experimental procedure
Modeling and simulation
Experimental results
Result & Discussion
Conclusion and Recommendation

Policy

Attendance	Regular attendance is expected. Student should notify the instructor of any planned absence. University regulations regarding absence will be strictly applied.
Students Conduct	Students should adhere to academic integrity and ethics. Cheating is absolutely not tolerated. University regulations will be enforced and applied to any student cheats, or attempts to.
Student Work	Will be assigned with their due times during lectures. Late work will not be accepted. All student work will be corrected, graded, handed back, and discussed further in the class upon their return.

Note: Any change in this form requires the approval of the **College Council**.