Chemy 499 Guide

May 2014
Introduction

The aim for this Handbook is to fulfill the need for a reference resource for undergraduate research project in experimental or theoretical chemistry at the Department of Chemistry; University of Bahrain. The Handbook is designed to serve as a guide to the program faculty and undergraduate chemistry students. Many chemistry programs now require undergraduate research for graduation. There are many benefits to undergraduate research such as learning, experiencing chemistry in a real world setting, getting the excitement of discovery and preparing for graduate school. Conducting a research project involves a series of steps that start at the inquiry level and end in writing a report. In the process, the student learns to:

- Practice ethics of research, perseverance and independent work
- Conduct scientific literature searches
- Read, interpret and extract information from journal articles related to your project
- Design experimental procedures
- Interpret results, draw conclusions, and generate new ideas based on your findings.
- Interact professionally with your peer students and professors within your research group, department and school

- Discuss and criticize the experimental results and data through written and oral presentations

On behalf of the 499-research committee, we want to welcome you for participating in this process. We are keen to give our students the opportunity to develop their research skills, which will enhance their opportunities for long life learning. We extend to you our best wishes for what is certain to be a rewarding and challenging experience.

Dr. Awatef Mahdi (Committee coordinator)
Dr. Jameela Al-Matawa
Dr. Suad Rashdan
Dr. Fadheela Al-Salman
Guidelines for students

Who should take the course?

- Single Track Chemistry Students
- Open to Chemistry major / minor students
- Number of passed credits ≥ 90 Cr
- It is recommended that two semesters be allocated to complete the project.

How to select the project?

- Talk to the instructors about their projects and then choose the project you like.
- After choosing the project, fill Chemy499 Senior Research Topic Submission Form A and submit the complete form to the head of the department.

Phases of the project

Usually the work in a project involves the following phases:

- **Preparation phase**: the supervisor will guide the student to identify the relevant research literature and use various research tools.
- **Experimental phase**: the student starts the experimental work, which includes preparation of samples, using instruments, data collection, its analysis and results.
- **Writing the report phase**: The student should follow the correct scientific writing method in his/her write up. The student should finish writing on time.
- **Oral presentation phase**: it is an opportunity for the student to present and defend the results of the project, gain skills in public speaking in a formal scientific setting and reflect his/her understanding of the subject. The oral presentation will be used in student learning evaluation and grade assessment.
  - The supervisor and the student should schedule the oral presentation at least two weeks prior to the grade submission deadline (usually Middle of December or middle of May).
  - The supervisor and student should select the “Examination committee and the supervisor should provide each member of the examination committee with one copy of the report, two weeks before the oral presentation.
Guidelines to the Supervisor

What the supervisor must do?

- Make an outline of the project, its scientific merit and its formal requirements.
- Officially, three contact hours a week must be allocated to the student during the semester in which he/she registered for 499.
- Draw a time plan for carrying out the project involving the four phases

Preparation Phase: it involves identifying relevant research literature to the student and advising the student to use various research tools, such as inter-net; library… etc.

Experimental Phase: it involves the experimental work including preparation of samples, using instruments, data collection and sample analysis.

Report & Presentation Phase: it involves:
  - Ensuring that the student is following the correct scientific writing method in his write up.
  - Correcting the submitted report to enable the student to submit his/her final report two weeks prior to the oral presentation.

- The supervisor and student should schedule the oral presentation one week prior to formal final exams period. This will allow ample time for students to comply with any required corrections in their reports.
- Select the examination committee.
- Provide each member of examination committee with one copy of the report, one week before the oral presentation.
- Even though student independence is encouraged, this does not imply that the supervisor’s role is secondary in importance. On the contrary, a higher degree of supervisor involvement is essential to achieve quality in project outcome.
- Supervisors shall assess student performance during execution of the project (Form B).
- The supervisor has to sum the examiners and his evaluations to submit the student’s grade according to University of Bahrain scale.
- The student and the supervisor are responsible for relevant corrections suggested by the examiners on the report.
- The supervisor has to submit a hard and soft copy of the report to the department.
Criteria for evaluation of Chemy499 student by the supervisor:

1- Scientific mindedness and critical thinking skills.

2- Planning and Management skills.
   - Ability to plan experiment and overall work schedule.
   - Ability to manage time properly and effectively.

3- Practical skills
   - Ability to comply with Laboratory Safety rules and Chemical Storage.
   - Confidence in operating instruments.
   - Confidence in performing laboratory techniques related to their work with minor or no supervision.
   - Neatness, tidiness and diligence.
   - Independence.

4- Motivation skills

5- General attitude skills
   - Collaboration
   - Amicability in all situations
   - Ability to learn and comprehend.
   - Ability to cope with and meet a new situation.
   - Problem solving ability.
   - Ability to access (acquire), search and evaluate new information and literature.
   - Other skills deemed by supervisor to be necessary.

6- Dissertation/Report (Form C)
   - Adherence to the report style and format adopted by the department.
FORMAT FOR THE PREPARATION OF A PROJECT REPORT

FOR B.Sc. IN CHEMISTRY

1. ARRANGEMENT OF CONTENTS:

The sequence in which the project report material is arranged and bound should be as follows:

1. Cover Page
2. Bonafide Certificate
3. Acknowledgment
4. Abstract
5. Table of Contents
6. List of Tables
7. List of Figures
8. List of Symbols, Abbreviations and Nomenclature
9. Chapters
10. Appendices
11. References

2. PAGE DIMENSIONS AND BINDING SPECIFICATIONS:
   The dimension of the project report should be in A4 size and soft bound. The text font color should be black.

3. PREPARATION FORMAT:

3.1 Cover Page – A specimen copy of the Cover page of the project report is given in Appendix 1.

3.2 Bonafide Certificate – The Bonafide Certificate shall be in double line spacing using Font Style Times New Roman and Font Size 14, as per the format in Appendix 2.

3.3 Abstract – Abstract should be no more than one page summary of the project report typed double line spacing, Font Style Times New Roman and Font Size 14.

3.4 Table of Contents – A specimen copy of the Table of Contents of the project report in Appendix 3.

3.5 List of Tables – The list should use exactly the same captions as they appear above the tables in the text. One and a half spacing should be adopted for typing the matter under this title.
3.6 **List of Figures** – The list should use exactly the same captions as they appear below the figures in the text. One and a half spacing should be adopted for typing the matter under this title.

3.7 **List of Symbols, Abbreviations and Nomenclature** – One and a half spacing should be adopted for typing the matter under this title. Standard symbols, abbreviations etc. should be used.

3.8 **Chapters** – The report includes four chapters:

   (i) Introduction (ii) Experimental (iii) discussion (iv) Conclusion and future work.

   ❖ Tables and figures in a chapter should be placed in the immediate vicinity of the reference where they are cited.

   ❖ Footnotes should be used sparingly. They should be typed single spaced and placed directly underneath in the very same page, which refers to the material they annotate.
   ❖ The reference(s) number should be mentioned at the end of the sentence in the main text. For example:

   Introduction of a cationic surface layer with (NH$_2$) amine on top of iron oxide nanoparticles surface is believed to have very good uptake by the cancer cells and provide sharper in vitro and in vivo MRI signals as compared to the conventional cross-linked iron oxide (CLIO) nanoparticles [1].

3.9 **Appendices** – Appendices are provided to give supplementary information, which if included in the main text may serve as a distraction and cloud the central theme.

   - Appendices should be numbered using Arabic numerals, e.g. Appendix 1, Appendix 2, etc.
   - Tables, Figures…etc appearing in appendices should be numbered and referred to at appropriate places just as in the case of chapters.

3.10 **List of References** – The references should be listed in the same order they appeared in the main text.

**A typical illustrative list of referencing:**

**Journal Articles**

**Books**


**Conference papers**


**Internet**

APPENDIX 1
(A typical Specimen of Cover Page & Title Page)

UNIVERSITY OF BAHRAIN
COLLEGE OF SCIENCE
DEPARTMENT OF CHEMISTRY

TITLE OF PROJECT REPORT
<Font Size 18><1.5 line spacing> Font Style Times New Roman – Bold>

A PROJECT REPORT <Font Size 14>
Submitted by <Font Size 14><Italic>
NAME OF THE CANDIDATE <Font Size 16>

in partial fulfillment for the award of the degree

of

<Font Size 14><1.5 line spacing><Italic>
NAME OF THE DEGREE <Font Size 16>

Supervisor

NAME OF SUPERVISOR(S) <Font Size 14>

MONTH & YEAR <font size 14>
UNIVERSITY OF BAHRAIN
COLLEGE OF SCIENCE
DEPARTMENT OF CHEMISTRY

NEW HYDRAZONES & PYRIDAZINES DERIVATIVES: SYNTHESIS & CHARACTERIZATION

A PROJECT REPORT
Submitted by
Fadel Abbas
2004xxxx

in partial fulfillment for the award of the degree
of
BACHELOR OF SCIENCE

Supervisor
Dr. Awatf Mahdi

JUNE 2010
APPENDIX 2
(A typical specimen of Bonafide Certificate)

UNIVERSITY OF BAHRAIN

BONAFIDE CERTIFICATE

Certified that this project report “..TITLE OF THE PROJECT....” is the bonafide work of “..NAME OF THE CANDIDATE(S)…” who carried out the project work under the supervision of <<Name of supervisor>>.

SUPERVISOR SIGNATURE
<<Signature of the Supervisor>>
<<Name>>

Date:

CHAIRPERSON SIGNATURE
<<Signature of the Chairperson>>
<<Name>>
<<Full address of the Department>>
Certified that this project report “NEW HYDRAZONES AND PYRIDAZINES DERIVATIVES: SYNTHESIS AND CHARACTERIZATION” is the bonafide work of “FADEL ABBAS AHMED” who carried out the project work under my supervision.

SIGNATURE
Dr. Awatef Mahdi

CHAIRPERSON
Department of Chemistry
College of Science
P.O. Box 32038
Sakir Campus
Kingdom of Bahrain

SIGNATURE
Dr. Awatef Mahdi

SUPERVISOR
Assistant professor
Department of Chemistry
College of Science
P.O. Box 32038
Sakir Campus
Kingdom of Bahrain
APPENDIX 3
(A typical specimen of table of contents)
<Font Style Times New Roman>

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College of Science
Department of Chemistry

Chemy 499 Senior Research Topic Submission (Form A)

Student Name: ______________________________ Date: ______________

I D Number: ______________ Telephone: __________________________

E-mail: ______________________________

The project's supervisor name: ______________________________

The project title: ____________________________________________

__________________________________________________________

__________________________________________________________

Supervisor’s Signature  Student’s Signature

Hand in to the chairperson of Department of Chemistry:

Dr Layla Al Shagri

Office: S41-0047

Telephone: 17437533
### CHEMY 499 Supervisor Evaluation (Form B)

**Student Name:** 

**Student Number:** 

**Project Title:** 

**Supervisor Name:** 

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**Supervisor signature**  

**Date**
CHEMY 499 Examiner Evaluation (Form C)

Student Name: ....................................................................................................................

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Examiner signature                                    Date

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Examiner signature                      Date

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