



FINAL YEAR RESEARCH PROJECT GUIDELINES (IS 42853)

FOR STUDENTS, SUPERVISORS AND EXAMINERS

**Department of Computing and Information Systems
Faculty of Computing**

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1 About the Research Project

The students who are enrolling in following degree program:

- B. Sc. (Hons) in Computing and Information Systems

should conduct a compulsory research project relevant to Information Systems with 8 credits work load. A project should be an in-depth study of an issue or topic in Information Systems. Topics can be selected by students with prior approval of the supervisor or the coordinator of this course unit will assign students for relevant topics. The selected or assigned topics should be directly relevant to a current topic in Information Systems and the students are expected to apply the knowledge gained throughout the study program.

Students are advised to plan the research project early in their first semester of fourth year. The research project is equivalent to 8 credits and the students are expected to conduct a proposal defending presentation, mid-term progress review presentation (by the supervisor), carry out the project and write a thesis under the guidance of a supervisor within a period of 4 – 5 months. At the end, students should present their research as oral and poster presentations. This research project is designed to

- improve individual analyzing and working ability under minimum supervisor guidance,
- practice scientific writing in accordance with acceptable standard,
- conduct and complete the project in given timelines with proposed deliverables which is an essential skill in industry.

These guidelines provide information on the scope of projects and what students should aim to achieve, how to plan the project, important considerations, and what examiners will be looking for.

1.1 How does a project fit into your degree?

The project provides an opportunity for a range of different types of research. For example, students could study the current topics or existing knowledge gap of information systems related subject area using a range of different data sources, design an intervention and evaluate it, complete a small survey, or study client use of other services. The research may focus on primary and secondary data sources provided it has relevance to national or international information systems related problems.

This project is used to increase the students' critical thinking ability in particular problem domain, identify knowledge gaps and define research problems, come up with a conceptual framework for addressing the identified research problem by applying learnt theory and research methodologies and eventually conclude the project with deliverables. Further, this will be an opportunity for students to develop their decision-

making skills and negotiation skills especially with supervisor's and examiners' interactions.

1.2 Objectives of the project

While projects vary in their aims, scope and design, they should be designed so as to allow student to demonstrate their ability to apply the principles of research at an undergraduate level. In reporting on the project, Students should show that they can:

- Identify and define a significant issue relevant to information system related topic.
- Systematically collect relevant up-to-date information about the issue, either directly or from published studies or publicly available data.
- Analyse, interpret and discuss the information in accordance with standard academic and Information Technology (IT) industry practice.
- Politely defend the need, motivation and proposed methodology of the research, while complying with supervisor's and examiner's recommendations.
- Draw conclusions and make recommendations relevant to the issue that will contribute to current knowledge and practice in IT industry.
- Write and present the study in accordance with academic standards at an undergraduate level.

1.3 Benefits of doing a research project

After completing this research project, students will be able to:

- Learn to read and interpret other researcher's work critically while doing their own (This gives them an insight into the effects of practical difficulties and theoretical debates on published research)
- Learn to develop a conceptual framework to address the identified knowledge gaps applying learnt research methodology concepts and technical theories
- Publish the work as peer-reviewed research papers (This will add additional value to students' CV in academic and industrial careers)

2 Guidelines for Students, Supervisors & Examiners

This project is an in-depth research study of an issue relevant to the field which is significantly differs from pure software development project. Final outcome of this project would be a conceptual framework or a working software prototype which inputs quantitative or qualitative measures about the issue. Students are expected to contribute something new to existing knowledge about the research topic while conducting their own work. The contribution should be original and free from plagiarism (The students will be penalized for such attempts).

2.1 Process

1. The fourth-year students under B.Sc. (Hons) in Computing and Information System should conduct this research project in first and second semester in connection with Research Method (IS 41247). Students are notified the supervisors' interested subject areas and their students ceiling at the beginning of the semester by the course coordinator. At that time, students are able to discuss with supervisors and get further knowledge about the topic.
2. The tentative title and the outline of the project and the assignment of the supervisor (having pre-approval for the topic from supervisor) must be notified by students to the course coordinator on a pre-given date (usually within 2-3 weeks). At that time, any students who do not have a topic or supervisor, the coordinator will assign him/her a topic and a supervisor. However, students are recommended to find supervisors by themselves.
3. The student will undertake the project under the guidance of the supervisor. The course coordinator may arrange a group seminar for the presentation of project outlines and literature survey within 8-10 weeks of assigning the projects. At the time, students should be able to defend their research topic in front of an appointed panel of examiners. This panel includes supervisor, two lecturers (At least one senior lecturer) and an external examiner from another department.
4. The student and the supervisor will meet periodically, to review the progress of the project.
5. If there are problems encountered in adhering to the time frame and other constraints, students should contact course coordinator without delay
6. The student will present the status of his/her project, at a mid-term Progress Review arranged by the supervisor about 5 months after assigning the projects.
7. The student will complete the project and write a draft thesis and submits it to the supervisor for comments / corrections in 15th week of the second semester. The number of pages of this thesis should be not less than 50 pages and students are

expected to read and follow the instructions and guidelines given in section 2.6 when preparing their thesis.

8. The student will submit a soft copy of the final thesis to the department on or before the notified deadline by the course coordinator. The submitting thesis should be the final version of the thesis and all corrections, given by the supervisor should be done in the thesis.
9. The project thesis will be evaluated by the supervisor and after receiving his/her recommendations, an oral examination and poster session will be arranged for the student to present and defend the project thesis. The presentation slides and poster should be reviewed and corrected by the supervisor.
10. The research project and oral/poster presentation will be evaluated.

2.2 Responsibilities of students

The students carrying out a final year research project are expected to undertake the following responsibilities:

- I. It is a requirement that the students engage in their project work for at least 120 hours and complete it (including the thesis) within a period of an academic year.
- II. Students should have preliminary discussions with supervisors before starting the project.
- III. This project is a compulsory course module; hence it is required to meet and discuss the project-related matters regularly having a prior appointment with the supervisor. Contacting through official channels such as emails is also recommended.
- IV. The student should maintain a work diary and need to update the diary regularly with important decision after meeting with the supervisor
- V. Students are highly encouraged to refer library and other academic journals, while they are conducting literature search and research tasks. If any research paper is inaccessible, students can request it from supervisor. Supervisor may get necessary actions to provide the paper in his/her best.
- VI. The students should keep informed supervisor and course coordinator, if any problem is raised interrupting their research work.
- VII. The students should maintain friendly environment with supervisors and colleagues in laboratories. If the student requires to access university assets such as computers, routers, sensors, and etc., they need a prior approval through proper channel. In such occasions, students should be responsible for the assets and should avoid misusing them.
- VIII. The students should make 12-minute presentations for defending research proposal and the progress of his/her project at the mid-term Progress Review Seminar, arranged by the Project Coordinator.

- IX. The students should get necessary actions to finish composing research thesis, presentation slides and posters providing enough time to review by supervisors (at least a week ahead). Students need to make all marked corrections by supervisor prior to submit the final thesis

2.3 Role of A Supervisor

The supervisor is expected to help the student, under their supervision by following ways to complete the final research project.

1. Guide students to formulate an appropriate project proposal and outline of the project thesis
2. Conduct meeting regularly.
3. Inform students the progress of their work whether it is satisfactory or not
4. Advise students to improve the research activities, composing thesis and presentations
5. Guide students to publish their work in peer-reviewed conferences or journals
6. Review the draft of research project thesis, presentation slides and poster and provide suggestions to improve them
7. Act as one of the examiners on submission of the project.

2.4 Finalizing research project proposal

Research project proposal is the most important document at the beginning of research project. This proposal guides students to conduct research effectively though out course duration. When the students prepare a research proposal, few important factors should be considered such as scope of the project, motivation and possibility to complete by given time frame. The project proposal should not exceed 3-5 pages and key components of the project proposal are as follows.

- **Title:** The title of the project, should not exceed 10 words
- **Proposer:** Name of the investigator and the student registration number
- **Research Problem:** The description of the problem which the student is going to solve from the research project
- **Hypothesis:** A statement of the hypothesis which are being tested, or the research question which are endeavored to answer, there should be at least one research question or maximum three research questions.
- **Background:** A summary of the key relevant literature, references, or needs analysis that justifies the project
- **Aims:** A statement of the expected outcomes of the project, and how they will help to address the problem
- **Objectives:** An outline of the specific strategies or steps by which students intend to achieve the research aims
- **Methodology:** A more detailed outline (sometimes called 'project protocol') of the actual research, data collection and analysis
- **Time Frame:** A timetable or plan of the key activities or stages of the project

- **Ethics (if available):** An appreciation of any ethical issues raised and how they will be addressed
- **References:** Students should follow IEEE guidelines

2.5 Project Time Frame

The students are expected to conduct and complete the research project on time. Hence, they need to manage their available time consciously and deliver the outcome in the suggested time frame. Table 2.1 shows the suggested time frame for this project is an academic year and the project time frame. When students propose a time frame to their research proposal, they should take these major timelines in to account and make proposal accordingly.

Table 2.1 Project Time Frame

Suggested Time Frame		Activity
Semester I	1 st Week -3 rd Week	Finding a supervisor, preliminary discussions with the supervisor and literature survey; submitting the project outline; planning and starting the project
	4 th Week	Submission of Proposal (project outline)
	4 th Week	Submission of Proposal defense presentation slides and self-recorded video.
	5 th Week	Proposal defending presentation at a seminar
Semester II	5 th Week	Mid-term review
	10 th Week	Completion of project work, preparation and submission of the draft thesis to the supervisor (The supervisors are expected to return the corrected project thesis within 1-2 week)
	14 th week	Preparation and submission of the final draft (consent form) of the project thesis and corrected Abstract.
	14 th week	Submission of Final defense presentation slides and self-recorded video.
	15 th week	Final Defense

2.6 Structuring your project thesis

A thesis produces the culmination of the research work as a formal product as documentation. As well, this documentation provides opportunities for students to plan, complete, interpret, and report research in a formal structure that lends a relatively uniform appearance to work completed at the Department of Computing and Information Systems. The work should demonstrate the ability to complete written description of the study in the form of a well-written, properly organized Thesis. The

research study must not have been published previously and must be conducted and written under the supervision of the supervisor.

Note: The final copies of the Thesis will not be accepted if the students have not prepared the Thesis according to the given guidelines.

When the students are composing the thesis, following structure may help to make high-quality project thesis and it should contain the following parts in the given order

- FRONT MATTER
 - Preliminary Pages
 - Cover page
 - Title page
 - Declaration page
 - Certification of Approval page
 - Dedication (If any)
 - Acknowledgments
 - Abstract
 - Table of Contents
 - List of Tables
 - List of Figures
 - List of Abbreviations (if any)

- THESIS CHAPTERS

Chapter One- Introduction

Chapter one should describe the motivation and/or the background of the study followed by;

Purpose of the study

The introduction chapter shall be initiated by clearly stating the purpose of the study. There should be a concise statement of purpose provided in this section, followed by specific objectives.

Statement of the Hypothesis or Research Question

A clear statement(s) that identifies the precise research question should be included. Each specific measurement to be conducted should be identified

Significance of the Study

As a part of the purpose of the study, there should be a justification(s) for conducting the research. This section should exhibit a clear understanding of what makes your study significant and why it should be conducted.

Definitions

A simple list of definitions of terms that directly pertain to this study should be provided.

The list should include definitions of terms that might be unclear to the reader.

Delimitations, Limitations, and Assumptions

A brief statement identifying the delimitations, limitations, and assumptions associated with your study should be provided.

Delimitations – factors that were controlled by the researcher

Limitations – factors that were not under the control of the researcher

Assumptions – factors that the researcher assumes were taken into consideration.

Contribution to the Study

A summary of your contribution to the research and the contribution of your study to the research field(s).

Composition of the Thesis

A brief description of each chapter to follow in the Thesis should be included.

Chapter Two- Literature Review

The main purpose of the literature review is to survey previous studies on the proposed research theme. The author should provide a breakdown of sub-topics influencing the research theme. Each sub-topic should contain a thorough examination of the literature that influences or is representative of current research on that subtopic. The literature review should collectively support the purpose of the proposed study. A theoretical framework as applicable to the field of study may be included here.

Chapter Three- Methodology

The Chapter Three should present each aspect of the progression by which the study will be completed.

Research Design

How you've set up your study, and what each piece of it aims to accomplish.

Data Collection

What you used to collect the data (surveys, questionnaires, interviews, trials, experiments, etc.) including sampling methods.

Implementation

How did you implement the proposed study as a pilot project? How the evaluation measures are to be calculated?

Data Analysis

In the data analysis, it is necessary to explain what does your data mean in the context of your research? Were your results conclusive or not? Remember to include what type of data you were working with (qualitative or quantitative? Primary or secondary sources?) and how any variables, factor into your results.

Chapter Four- Results and Findings

The results should be elaborated in an order that is similar to the order presented research hypothesis or research questions. Chapter should provide all the descriptive data such as demographic results, results of the statistical processes conducted, and a brief summary of the results with foundational interpretations of what the statistics provide.

Chapter Five- Discussion and Conclusion

Summary of Findings

Provide inferences and implications that the results of the study provided the author and the reader or others who may have an interest in the results. This is a time to expound on your results and offer insight into what your study does or does not contribute to the body of information on your topic.

Conclusions Drawn by Results

Identify specific conclusions resulting from the study. Offer specific insight to what the findings reveal. This section should synthesize your findings with the current knowledge in your area of study.

Recommendations for Further Research

Provide recommendations to further research on this topic or how parts of study could be improved upon. If you found as a result of study that another topic should be looked at in order to offer more insight into this topic, then suggest that at this time. It is important that this part of the conclusion incorporate the implications of your findings in terms of other research in the area of study.

- BACK MATTER

Publications

Provide a list of publications obtained by the study in the Thesis. (e.g.: Abstracts, posters, conference proceedings, journal articles, book chapters etc.)

Appendices

Appendices are useful to present supplementary or raw data, details of the methodology, Questionnaires, consent forms, or other information that would detract from the presentation of the research in the main body of the Thesis but would assist readers in their review.

References

Provide a list of references used for Thesis. A reference list is the list of all books, articles, and other source of materials, which were referred and should be listed according to the international referencing method adopted.

Bibliography (if any)

A bibliography is a list that combines a detailed list of references cited in your work and the background readings or other material that you may have read, but not cited.

2.7 Preparing Oral/Poster Presentation

2.7.1 Oral Presentation Guidelines

Students are notified the date and venue for the oral presentation through course coordinator after submitting the proposal.

This presentation includes two sessions: students presenting session which stands for 12 minutes and panel questioning session which stand for 03 minutes. Students should be vigilant about the time constraints when creating the presentation slides and students will be penalized if he/she could not finish the presentation in allocated time. Students are notified the time by a bell. The bell will be rung in 10th minute at first time and secondly at 12th minute. At that time, students should finish the talk without delay.

Oral Presentation can be done for both Proposal defense and final defense. The recommended structure for the presentation is as follows for both.

Presentation structure for Proposal Defense

- Background
- Literature Review
- Research Gap
- Problem Statement & Research Questions
- Research Objectives & Goals
- Proposed Research Method/s
- Expected Outcome/s
- References

Presentation structure for Final Defense

- Introduction (including Literature Review)
- Methodology
- Observations and/or Results
- Discussion
- General Conclusion(s)
- Future Work

- Publications (if any)
- References

2.7.2 Poster Presentation Guidelines

Students are notified the date and venue for the poster presentation through the course coordinator after submitting the draft version of the thesis. When the students design a poster, following list of facts should be followed.

- The poster should be 4' wide by 3' high
- Posters should be created using software programs
- The title of the poster, the name of the student and supervisor name should appear at the top of the poster.
- Appropriate headings should be given to structure the poster and the text of the poster should be legible
- The poster should explain both visually and verbally the relevance and/or importance of the research and should aim to catch the interest of the viewers quickly and effectively.
- The presented text should be clear and concise, explaining the purpose of the project, the research conducted, and the results and conclusions.
- Text should be kept to a minimum with most of the information being presented by means of graphics and/or visual images. [Visuals can be in forms of tables, charts, figures, drawings, and/or photographs. All visuals should be labeled with a caption that explains/interprets the content of the graphic.]
- Background colors or images should complement, and not distract from the poster's topic, text and graphics. The poster should be free of spelling and grammatical errors.

3 Evaluation Criteria

This section is addressed to supervisors and examiners. It provides information on general considerations and assessment criteria for the project. It also provides guidance to students about what examiners will be looking for in examining projects.

The evaluation is conducted throughout the course in several phases such as

- Project Proposal Presentation (10%),
- Mid-term Progress Review as a Poster Presentation (10%),
- Final Thesis (50%),
- Final Defense Oral Presentation (25%) and
- Publications (05%).

Each assessment carries a weighted mark (as stated) to the project's final result.

While the projects may vary from one to another in scope and way of presenting the facts, examiners and supervisors may wish to consider the following points:

- Are the project aims (including the research problem, research questions, boundaries, and desired outcomes) well formulated?
- Are the background conditions and motivation described sufficiently to provide a rationale for the project?
- Are relevant concepts and empirical studies in open literature critically reviewed?
- Is the methodology fit with the aims and the stated problems of the study appropriately?
- Is the methodology consistent and reflecting an adequate amount of effort for an undergraduate student?
- Are the findings and experiences well summarised?
- Are the findings well discussed and are the implications valid for the candidate's own situation and conditions?
- Is it an original work of the student and what is the contribution to the area of research?
- Does student maintain minimum expectations from a scientific writing including style of writing, presentation, and grammatical expression?
- Is the study potential to publish in peer-reviewed journals or conferences?

3.1 Assessment criteria for the project proposal presentation

The first evaluation is conducted at the project proposal presentation. This assessment carries 10% marks to the final results of the final year research project. The evaluation criteria provided in Table 3.1

Table 3.1 Proposal Defense Evaluation Criteria

Criteria		Marks Allocation
Evaluation of Presentation Skills (20%)		
1	Clarity of Audio Visuals	5%
2	Professional and confident	5%
3	Engaged with audience	5%
4	Clear voice with good pace	5%
Evaluation of ORAL outcomes (60%)		
1	How well the research gap is identified in the selected research domain?	10%
2	How were the proposed Research Questions been mapped with Title?	10%
3	Was the Proposed Methodology explained well to address the research objectives (Research methods, etc.)?	10%
4	Was Research Significance highlighted (Objectives, importance, etc.)?	10%
5	Does the ORAL discussion completely and succinctly describe the research project?	10%
6	Able to produce comprehensive Research Proposal (Informative and clear research proposal summary)	10%
Answers to Questions (20%)		
1	Presenter(s) demonstrate full knowledge of the material and can explain and elaborate on expected questions.	20%

3.2 Assessment criteria for the Mid-term Progress Review Seminar

The second evaluation is conducted as the mid-term progress review seminar. This assessment carries 10% marks to the final results of the final year research project and it is usually conducted as a poster presentation of the project and a feedback will be provided by the panel/supervisor to validate whether the student is satisfactorily progressing. The evaluation criteria are as in Table 3.2:

Table 3.2 Mid Term Progress Evaluation Criteria

Criteria	Marks Allocation
Layout and Design: Graphical illustrations enhance meaning, capture viewers' attention, arouse interest in the topic, Neat and presentable (uncluttered), Aesthetically pleasing	5%
Presentation of Methodology: Graphical presentation of methodology	20%

Technical Competency: Demonstrate knowledge gained from the project, Able to answer correctly to questions related to the presented facts, theories, and process	15%
Content Accuracy: Items presented are related to the project, highlight key issues/contributions, Use precise language	15%
Presentation of results and conclusion: Presentation of results using graphs and figures	20%
Innovativeness/novelty/patentability/commercialization potential publication: Project and finding are novel, Product and process can be patented, Ideas presented are new and unique, the product or discovery has great commercialization potential or is published in peer-reviewed publications, Findings/products/process can benefit the society	20%
Overall Presentation Mechanics: Linguistically correct (no grammatical and spelling errors), clear and easily understandable	05%

3.3 Assessment criteria for the Final research project thesis

The third evaluation is conducted in the final phase by reviewing the submitted research project thesis. This assessment carries 50% marks to the final results of the final year research project evaluated by the principal supervisor and a peer examiner. The evaluation criteria are as in Table 3.3:

Table 3.3 Thesis Report Evaluation Criteria

Criteria	Marks Allocation
Background and Problem Identification	20%
Maintaining the structure and flow of the thesis	20%
Results and analysis/Quality improvement	30%
Quality of expression and clarity: Writing Style, Spelling and Grammar correctness	20%
Completeness and validity of the solution	10%

3.4 Assessment criteria for the final defense oral presentation

The fourth evaluation is conducted at this phase after submitting the research project thesis as a oral presentation. This assessment carries 25% marks to the final results of the final year research project given by viva panel. The evaluation criteria are as in Table 3.4:

Table 3.4 Final Defense Evaluation Criteria

Criteria	Marks Allocation	
Evaluation of Presentation Skills (20%)		
1	Clarity of Audio Visuals	05%
2	Professional and confident	05%

3	Engaged with audience	05%
4	Clear voice with good pace	05%
Evaluation of ORAL outcomes (60%)		
1	Was Research Significance is highlighted (Objectives, importance etc.)?	10%
2	How was the proposed Research Questions have been mapped with Title?	10%
3	Does the design of the study was appropriate to test the hypotheses or answer the research questions (Research methods, etc.)?	10%
4	Does an appropriate information gathering method was adopted?	10%
5	Does the analysis/ implementation lead to an appropriate /sufficient outcome?	10%
6	Does the proposed research expand knowledge and give a new point of view for other researchers?	05%
7	Does the ORAL discussion completely and succinctly describe the research project?	05%
Answers to Questions (20%)		
1	Presenter(s) demonstrate full knowledge of the material and can explain and elaborate on expected questions.	20%

3.5 Assessment criteria for the Publications of the students for the research project

The fifth evaluation is conducted as a review of each student’s publication list submitted to the department. The coordinator and the assistant coordinator are responsible to review student’s publication list and provide the marks. This assessment carries 05% marks to the final results of the final year research project. The evaluation criteria are as in Table 3.5:

Table 3.5: Publication Evaluation Criteria

Publication Type	Marks
Abstracts	0.5
Extended Abstracts	0.75
Conference Papers	2
Journal Papers	3
Book chapters	3