**APPENDIX TO: Student Briefing** (IT7351 Project)

# Applied Research Projects

## Acceptance

Some students may wish to conduct applied research as their student project. This may appeal to those considering further post-graduate study. In most cases the requirements are just the same as a normal project, and the project is conducted as if it was a contestable funded research project, that is, requiring full accountability. In this manner the Client will usually be needing something created, or some analysis done for a practical application, but founded on research.

Projects that are solely research based are unlikely to be approved. Please discuss your ideas with the project co-ordinator.

We would normally only expect well motivated, higher achieving students to apply for applied research projects. The level of independence, writing skills and work cohesion required are particularly challenging.

The Advisor for this type of project needs to be an accomplished researcher. Please consult with the Project Co-ordinator prior to making any approaches to staff about undertaking the advisor role.

## Requirements – Design of Project

All the requirements of a normal project apply, but the nature of the Proposal and the expected assessment items may change depending on the focus of the work. A suggested starting point follows.

A primary output of some Applied Research Projects may be a Research Paper, of publishable quality for a publication aligned for beginner research, together with the implementation or application of the research outcome. The topics offered are geared towards the application of research to solve a problem, typically applicable to industry, rather than pure research to extend knowledge. The Applied Research marking schedule should be used. The Research Paper is expected to be in the region of 5000-10000 words, plus appendices, bibliographies and references.

If the business outcome is a proposal of some kind founded on research, then the descriptive terms in the marking schedule below (Development and Research Paper headings) should change to something more aligned to the task, but the proportions and activities should be the same.

Projects with a research focus that still are geared towards producing a system (hardware/software + integration) should be handled under the guidelines for a normal project with the research element as an expanded analysis and design exercise. In this case research rigor is expected though the time available will not allow a full normal research process/proposal to be undertaken.

There may be experimental systems developed or other significant outputs that will need to be incorporated into the research planning, and eventually the marking schedule. The student can propose this in the usual manner if it is required.

As the BIT undergraduate student is not well versed in academic research standards and methods, the proposal will reflect this in a number of ways. Firstly the project requirements must be specified by the client or advisor with a number of stages or outputs that will lead the students through the research process (typically certain presentations and demonstrations will be required). The documentation produced for these stages will be heavily reused in any Research Paper output. Milestones from this process must be part of the milestone set proposed for the project. Secondly the assessment panel will be aware of your limitations in this field and will mark accordingly.

## Requirements – Content

The research method needs serious consideration. There are quite a number of methodologies suited to various research goals. Please refer to Leedy (1997) page 111 for a useful description, and the feasibility checklists on pages 112-113. A clear decision needs to be made regarding quantitative/qualitative paradigms, and a research method selected appropriate both to the skills and situation. There will be a tendency to select experimental methods, surveys and action research methods. The method or situation may require Human Ethics clearance, please consult with the Project Co-ordinator as soon as possible once the method is selected.

It is critical that all research is grounded in the current theory and that the student has full justification for methods, data selections, statistical analysis selected etc, otherwise the outcome for the research is effectively meaningless and unusable. All these factors should be explored in the literature review and should support the established research question, methods etc selected. This is all documented in the proposal. This level of detail is time consuming to generate as it requires its own analysis and design activities, and thus the proposal is expected somewhat later. However, a plan for generating the proposal should be formulated and reviewed with the Advisor as soon as possible. A well-formed proposal could easily consume 100 hours. In many cases the actual experimental or active research part is almost trivial compared with the work to properly establish the proposal and define the post-experimental analysis and documentation activities.

## Requirements – Review

In addition to the normal review processes there will be a more thorough assessment of the Research Proposal. The research proposal is a substantial document that could take many hours to produce, and underpins all the remaining activities, and needs to be validated before further work continues. The project co-ordinator, as part of their Quality Assurance role for the Proposal, will include a review of this document by a number of researching staff and will return the requirements and suggestions back to the advisor and/or student.

## The Applied Research Proposal

Applied Research Proposals differ somewhat between qualitative and quantitative paradigms. In many ways the proposal is the same as the normal project; it presents details of WHY and CONTEXT, an argument about HOW it is possible, a decision, and a detailed plan.

As this project must be treated as a contestable funded project, the planning for this activity should follow regular project proposal features.

Please note that the literature review needs to be substantial, and grounded and explore the problem context, currently accepted knowledge in this area, and underpin the analytic and experimental processes.

In overview just **replace the normal Proposal items 3-7 with the following** recommended formats (Leedy, 1997, p127-128):

### Quantitative research project proposal

1. The problem and its setting
   * The statement of the problem (and sub problems)
   * The hypothesis
   * The delimitations
   * Definitions of terms
   * The assumptions
   * The importance of the study
2. Review of Related Literature
3. The data and the treatment of the data
   * The data
     + The primary data
     + The secondary data
   * Criteria for the admissibility of the data
   * The research methodology
   * The specific treatment of the data for each sub-problem
     + Sub problem 1
       - The data needed
       - The location of the data
       - The means of obtaining the data
       - The treatment of the data
     + Sub problem 2....
4. The qualifications of the researcher
5. The outline of the proposed study
6. Selected bibliography

### Qualitative research project proposal

1. Introduction
   1. General background of study
   2. Purpose of study
   3. Guiding questions
   4. Delimitations and limitations
   5. Significance
2. Methodology
   1. Theoretical framework
   2. Type of design
   3. Role of researcher
   4. Selection and description of site and participants
   5. Data collection strategies
   6. Data analysis strategies
   7. How the results will be presented
   8. Methods of achieving trustworthiness
3. Findings
   1. Relationship to literature
   2. Relationship to theory
   3. Relationship to practice
4. Selected bibliography

In the same mode as the normal proposal, each of these sections should be concise, short, and well focussed. The only sections that should contain more verbose descriptions lie in the introduction or the description of the problem and its setting.

## Research Marking Schedule

A proposed research marking schedule follows. Please note that just like the other marking schedules, the student may propose their own schedule during their design phase.

The ‘standard’ Applied Research marking assessment schedule for IT7351 is:

|  |  |  |
| --- | --- | --- |
| **Assessment Item** | **Weighting** | **Comments/Notes** |
| **Research Proposal ^** | 10% |  |
| **Audit Reviews ^** | 10% |  |
| **Development** |  |  |
| *Data Analysis, Collection and Conversion* | 10% |  |
| *Experiment methodology (selection and implementation)* | 15% |  |
| **Research Paper** |  |  |
| *Comprehensive Review of Literature* | 10% |  |
| *Interpretation of Results* | 15% |  |
| *Organisation/Bibliography/References* | 5% |  |
| **Research Management** |  |  |
| *Assessed at completion* | *Audit marks revised* |  |
| **Documentation. & presentation** |  |  |
| *^Individual Project report* | 10%\* |  |
| *^Project Presentation* | 5%\* |  |
| **Client Evaluation** | 10%\* |  |
| All milestones approved by Advisor | Pass / Fail |  |
| Required deliverables (^) present | Pass / Fail |  |
| Acceptable quality / quantity / ethical conduct | Pass / Fail |  |
|  | 100 |  |

\* The minimum weightings allowable.

^ Required deliverables

All other marking requirements and guidelines apply. Applied Research Projects are encouraged to select the Poster option for their project presentation.