

**College of Engineering and Technology**

Department of Electronics Computing and Maths

**MSc Control and Instrumentation**

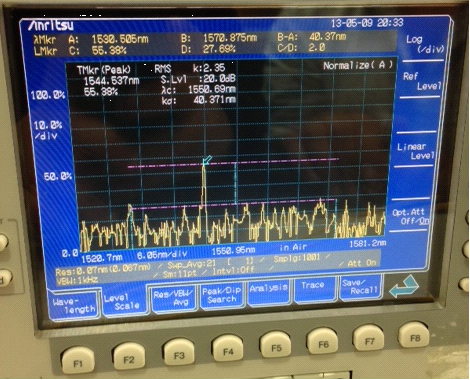
**Independent Engineering Scholarship**

**(7EJ998)**

**Module Handbook**

**Spring 2017**

**(Provisional - Subject to External Moderation)**



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# 1 Foreword

Welcome to the Independent Engineering Scholarship (IES) module. The IES is the most important element of your MSc programme. It provides you the opportunity to demonstrate independence and the ability to carry out original work. It also gives you the opportunity to plan and organise a substantial project over a determined period, and to put into practice the techniques you have learnt throughout the course. Regardless of your level of academic achievement so far, you can show your individuality and inspiration in this project. It should be the most satisfying piece of work in your course.

The IES also offers the chance for considerable personal development by enhancing existing skills of planning and organisation and, helping to develop new skills of a practical and methodological nature, which will enhance your future career prospects.

To pass your IES module you must demonstrate the ability to carry out basic background research, to produce a non-trivial implementation and to write a report.

Please make a note of and adhere to the following dates:

Submit the final project proposal: 6 February 2017

Interim Presentation: week commencing 13 March 2017

Submit final dissertation: 19 May 2017

A viva voce presentation: week commencing 29 May 2017

We may video record all the viva voce presentations. This will be used only for moderation purposes and to make sure that marks are fully accredited for all your contributions in the presentation.

I am the module leader and responsible for the overall coordination of the Independence Engineering Scholarship. You can contact me if you have any problem with the organisation of your IES.

Dr. Ahmad Kharaz

Jan 2017

# 2 Independent Engineering Scholarship (IES)

## 2.1 The Role of IES in this Programme

The***IES***is an essential component of a postgraduate degree. As the name implies, it provides a major opportunity for you to demonstrate your ability to work independently on an approved project largely of your own choosing. As it takes place in the final stage of your degree programme, you are able to apply, and further develop, the skills and knowledge you have acquired by that stage. In addition to the application of subject specific skills, and general skills such as critical analysis, objective evaluation, problem solving, formulating and testing hypotheses, you will be expected to display innovative, creative thinking and organisational skills.

The *IES* is a triple module, contributing 1/3 to your MSc grade. This weighting reflects the significance attached to the IES in your programme.

The module specification is detailed in the next section.

## 2.2 Module Specification

|  |  |  |  |
| --- | --- | --- | --- |
| **Module Title** | **INDEPENDENT ENGINEERING SCHOLARSHIP** | | |
| **Module Code** | **7EJ998** | **Pre-requisite** | **PG Diploma** |
| **Date of Approval** |  | | |
| **Module Level** | **7** | | |
| **Credit value** | **60** | | |
| **Total Number of Learning Hours** | **600** | | |
| **Key Words** | project, dissertation, research, design, ethics, evaluation | | |
| **Module Delivery** | Online/Distance | Blended/Face to face | Work-based learning |
| **Mode** |  | **√** |  |
| **Module Description** | The Independent Engineering Scholarship forms an essential, integral and substantial part of your Master’s degree. It will provide you with an opportunity to apply and enhance the knowledge and intellectual skills gained during your programme and allow you to develop your specialist skills in an area of your choice.  The aim is to develop your ability to work independently, in a chosen topic, using appropriate research and design concepts, and analytical, test, measurement and evaluation techniques, in order to produce a finished artefact or product. You will be expected not merely to collect, analyse and apply information, but also to exhibit other skills such as the ability to plan, manage and produce a significant technical piece of work.    You will be challenged to demonstrate a critical understanding of how the boundaries of knowledge are advanced through research in production of clear, logically argued and original work related to the field of your study. | | |
| **Module Learning Outcomes** | On successful completion of the module, students will be able to:   * Plan and initiate a major piece of engineering scholarship, demonstrating innovation, application of research methods, and advanced engineering practice.   2. Work on own initiative, developing and applying techniques of scientific enquiry, project management, analysis, experimentation, research, and problem solving.  3. Reflect upon the work undertaken, placing the results into the context of theories and practice, and the original plan for the study.  4. Present and discuss findings in depth, in spoken and written form, clearly communicating the critical issues and key features. | | |
| **Module Content** | This Module represents a major learning experience, providing an opportunity to pursue in considerable depth and with suitable academic rigor, a specific specialism related to the programme. The topic chosen should represent a substantial piece of technical work in the field of the Master’s programme of study. It must contain clear elements of research, engineering experimentation, analysis of data, critical evaluation, and original contribution. In many cases these will be placed in a scenario containing design, build, test, and commission of an original product or system.  Full details of module operation are contained in the module handbook; the essential details are given here. Each student will be supervised by a project supervisor appointed by the Module Leader, individually negotiated and agreed. A second supervisor will also be appointed.  Before project work commences, preparatory workshops will be held, in which possible topics are considered, and the academic standard and the required style of working explored. Students will be given the opportunity to draft project proposals, and receive formative feedback on these.  Following this initial project guidance, students will be required to submit a project proposal, usually 4-5 months before the date of final submission. The proposal will identify the aims of the study, and how it is to be undertaken; it will also contain a Risk Assessment and Ethical Assessment. . The supervisor will ensure that the proposed project is of adequate academic standard to constitute Masters level work, containing appropriate characteristics of original work, technical sophistication, and research orientation. The proposal will be graded by the project supervisor. He/she may also require changes to it, but this is not an opportunity to change the grade awarded. This grade will contribute to the first assessment point. Work on the project commences when the proposal has been approved by the supervisor.  As the work develops, one-to-one tutorials will be used to monitor and guide project progress. It is the student’s responsibility to arrange these. Approximately 3 months before final submission, students will be required to report on their initial progress in a viva voce session to a panel made up of their peers and members of the teaching team.  The final dissertation will be independently assessed and graded by first and second supervisor. These will then agree a final mark. A few weeks after submission of the dissertation, each student will be required to present a viva voce describing the main outcomes of the project, to a panel made up of their peers and members of the teaching team. Students should avoid repeating material already presented in their progress presentation.  All research undertaken by staff and students under the aegis of the University of Derby should only be undertaken after effective consideration of its ethical implications. Full regard of the University's Code of Practice on Research Ethics should be given, as found at <http://www.derby.ac.uk/research/uod/researchethicsandintegrity/> | | |
| **Module Learning and Teaching Methods** | **Learning & Teaching Methods**  The teaching and learning strategy will be based on tutorial work to help develop a workable project plan and ethical approval form.  **Scheduled learning and teaching activities: 5%**  **Guided independent study: 95%**  **Placement/study abroad: 0%** | | |
| **Module Assessment**  **Method** | **Formative assessment**  Feedback will be given following the development of a draft project plan and an ethical approval form containing a preliminary literature review.  **Summative Assessment**  **Assessment Weighting:** **100% Coursework**  **CW1:** 20% Weighting: Learning Outcome 1 to be assessed.  This coursework is made up of two components:  1. A written proposal defining the project.  2. A viva voce progress presentation of up to 15 minutes, with 15 minutes of questions.  These two components will carry equal weight.  **CW2:** 80% Weighting: Learning Outcomes 2, 3, 4 to be assessed.  This coursework is made up of two components:  1. A dissertation, of not more than 20,000 words.  2. A viva voce presentation of up to 20 minutes, followed by a question and answer session of the same time.  The dissertation is weighted at 80% of CW2. | | |
| **Reading list** | |  | | --- | | Link to ASPIRE.  <https://derby.rl.talis.com/modules/7ej998.html> | | | |

# 3 Choosing, Setting Up and Running Your IES

## 3.1 General Advice

In many respects, the challenge of *IES* promises the most potentially exciting and fulfilling period of your studies because you will be in the driving seat, testing your skills and knowledge you have acquired to date in an arena that you have designated for yourself. Although a multitude of factors, play a part in achieving a good result, there are certain elements which are indispensable. These could be summarised as:

**Selection**

**Planning**

**Urgency**

**Resource**

By themselves, these may not spell success, but certainly do add up to what you need to get you there. The all-important selection of a topic that is right for you; planning, self-evidently necessary in defining and achieving your aims; a sense of urgency (not to be confused with panic) driving you to consciously apply your energies to the task in hand; and resource, not only in terms of a flexible response to problems, but in identifying and making best use of the opportunities and materials available to you; these are what will spur you on to success.

Remember, whether you are going for a self proposed project or for a tutor proposed IES, the issues involved should be discussed initially with subject staff in the area(s) you intend to cover and latterly with your appointed supervisor(s) (you will not be expected to go it alone) but they are there merely to advise, and the final word normally lies with you. You will, therefore, have a good deal of discretion in choosing, planning and carrying your study through, although this will not be totally unrestrained.

## 3.2 Choosing Your Topic

The selection of your *IES* topic is one of the most crucial decisions you will have to make in your postgraduate career. IES titles will be proposed by members of staff and provided for students to choose.

The issue you examine should be selected with great care. Whilst ideas for the *IES* may come in a flash of inspiration, it is more likely that you will already have a rough idea of what you want to do, based perhaps on work already done during your honours degree programme. Alternatively, you may find ideas generated by discussions in your own working environment or you may wish to select a tutor proposed IES (a number of IES ideas will be made available for you in this respect). In the case of part-time students, it is important to discuss your ideas with your organisation before you finalise your topic. A IES can be of great benefit to the organisation involved and if it is seen in this way you are likely to receive far more support.

It may help to regard your *IES* work as a progression of skills and competencies developed during the programme. In *IES,* there is the need to relate more specialist issues to the wider context.

## 3.3 Questions to be asked when choosing your topic:

|  |
| --- |
| * Is the topic feasible, suitable and acceptable for IES? * Is the topic too broad? * Is it “doable” within the time scale? * Is it at the correct academic level? * Is there opportunity to review, reference and build on current research in the field? * Will I have access to the relevant sources of information? * Do you have access to the resources needed? * Is it both worth doing and of interest to me? * Could the results be suitable for publication?   *If you are a part-time student you will also need to consider the following points:*   * Do I have my organisation’s approval? * Do they understand the timescales? * Are there any confidentiality issues? * Has my organisation allocated sufficient resources? |

A key requirement is that it should be possible to view the subject of *IES* from a perspective that forms part of your particular programme. This does not mean that you need to look for a huge topic that tries to solve all the problems of the engineering industry. Experience has shown that the most successful IESs are those which focus their attention on a limited area of study. However, the study should **not** be treated from a purely specialist viewpoint, otherwise, your IES will fail to meet the requirement of showing that you can **integrate** your studies in the context of the chosen topic.

## 3.4 Setting up Your IES

This involves many of the same issues of planning and resourcing that need to be considered in the selection of your topic but entails dovetailing them into a coherent structure with specific goals and a timetable for their achievement. Following a presentation from the IES Module Leader, you will be asked to provide an outline review of the IES in advance of its commencement, to allow supervisors to engage with your objectives and advise on their implementation.

## 3.4.1 Preparing Your IES Proposal

|  |
| --- |
| You will need to think about and be able to determine the following:   * The aim of your study (one broad aim) * The objective(s) of your study. (may not be more than 4 objectives) * The problems you are proposing to set yourself and why. * How do you aim to achieve the objectives * The specific Learning Outcomes that are appropriate to your IES – see Generic Learning Outcomes * What literary sources or individuals you need to consult. * What data you may need to collect and how you will go about this. * What other sources and facilities e.g. materials, expertise, permits, etc., will be necessary to undertake the study. * Bibliography (not less than 10 articles in the proposed area) |

Following on from this, you will need to construct a credible timetable (NB: this will vary considerably depending on the resources needed and the availability of components to be purchased). It should set out any required deadlines of an administrative character (e.g. assessment schedules etc.), and the time scale of the acquisition of any software or hardware requirement. Most important of all, where writing is concerned, allow plenty of time - you need time for critical reading and re-casting and it will all take much longer than you think it possibly could! Many of these dates may be, and often should be, subject to revision, but they will form a necessary framework for the design of your project.

### 3.4.2 Writing Your PROPOSAL

The IES proposal should be on the official proposal form that is supplied to you through the IES module resources. All sections must be completed including the risk assessment and ethics forms that form part of the document.

**Project Title**

Ideally this is a brief title describing the main project theme.

E.g.: Micro Quadrotor: Design, Modelling, Identification and Control

Design and implementation of a Domestic Security System.

**Name and Programme of Study**

Clearly identify your name, the programme of study.

**Aim and Objectives of the IES**

There should be one aim and between 3 and 6 objectives (more does not necessarily mean better) of the form shown below as an example.

# Aim: Design and implement a control system for a micro quad-rotor

Objectives:

* Develop an Analytical Model for MatLab/Simulink models.
* Design a controller using advanced optimisation techniques
* Experimental testing and dynamic assessment of the designed system on a real Micro quad-rotor.

These aims will provide a benchmark against which the success/failure of the project can be judged. It is important to be concise and clear in terms of what you are hoping to achieve.

**Project Definition**

This section describes the facts, figures, technical background and any other information that is needed to define the project being undertaken. The aim of the project should be justified in terms of their relevance in a technical/commercial/social context, given the financial and time constraints placed on the project. Previous work in the area should be described, along with an explanation of how the proposed project builds on this work. Any special features of the project should be identified (e.g. industrial involvement, commercial potential, novel applications, intellectual property rights) and described in detail.

**Plan of Work**

This should include a timetable of events with brief explanatory notes. A critical path should be identified, if it exists. Each activity should include an estimate of the time needed to complete the element. It is vitally important to ensure you plan for lead times on items that require purchasing or manufacture. Your plan should clearly identify the progress you expect to have made at the time of the interim report. A planning chart (Gantt chart), of the type shown below, may be useful to help you identify when different tasks will need to take place.

**Resources**

Any costs above the specified expenditure limit of the project should be identified here if possible, and will be subject to the application for Revision of Project Expenditure Limit. This section should also describe **particular** laboratory facilities/access or equipment that is required.

## 3.6 Running Your Project

Assuming that you have got the **selection** and **planning** right, this is where the **urgency** and **resource** come in. Although planning can save unnecessary effort and enables you to use your time effectively, you will need to apply an appropriate deployment of your intellectual and material resources, otherwise the result will be unsatisfactory. Never sideline the progression of your project. Nothing is more likely to result in disaster and personal anguish than a project, however well planned which has run out of time. Constantly update your progress and maintain regular contact with your supervisor.

Be flexible in your approach and be prepared to correct and adjust your programme as necessary. Whenever you meet a problem that you feel you cannot resolve, discuss it with your supervisor. If you feel that you have been over ambitious, or the material or data you expected to produce or receive is not forthcoming, be prepared to make adjustments.

Remember, no matter how brilliant your project turns out to be, you will not get more than 60 credits for it, and the allocation of time for three modules, however diverting, is a mere 600 hours. Now it may be reasonable to exceed this, if you feel you must, but not by so much that you have to rob time from other important activities. It is up to you to make sensible judgements here - no one else can.

It is a mistake to over produce; projects are almost invariably improved by ruthless pruning. Remember, there are penalties for going seriously over specified limits.

It is essential to keep to deadlines, and late submissions are not acceptable. Extensions will not be approved unless the reasons are compelling. Minor illnesses or last minute hitches are not accepted as reasons for an extension.

**Submissions after deadlines will not be marked.** However, your supervisor may provide advice, but you will receive an NS (No work has been submitted) grade.

A worthwhile project, which is well planned and managed will be a source of great pleasure and satisfaction, and will develop not only transferable personal skills, but also a strong sense of purpose and a well justified confidence in your own abilities.

# 4 Supervision of your Project

## 4.1 Roles of Module Leader and Supervisors

Apart from your own contribution, a number of other people will be involved in the project, and it is important to be clear what their roles are.

**Module Leader** *Responsible for the co-ordination of all projects and liaison between supervisors and students.*

***Principal Supervisor*** Responsible for discussing with you the aims and feasibility of your project, offering help with reading lists and support and guidance in all practical work that you undertake. The *Principal Supervisor* will also advise on the choice of methods, analysis and presentation.

***Second Supervisor*** Responsible for providing additional support. In conjunction with the *Principal Supervisor*, will be responsible for assessing your work, which may also be subject to review by the External Examiner appointed by the University in the most appropriate area of study for your project.

Since the *Project* is seen primarily as an opportunity for you to work in your own way, at your own pace and using your own initiative, supervision will be kept to a minimum. However, for a variety of good educational reasons, some students will require more supervisory assistance than others to reach their full potential. Any additional help given will be noted, but does not count against you if it is academically justifiable. Normally what you can expect after the initial introductory meetings, is regular short discussions of progress and comment. For example, you could expect to get detailed critical advice on content and presentation of at least one major section of your work.

# 5 Assessment

## 5.1 Assessment Process

Your two supervisors will assess your work and will assign grades to the **all of the above submissions** independently of one another.

Project proposal (10%): 06 Feb 2017

Interim Presentation (10%): 13 March 2017

Submit final dissertation (80%): 19 May 2017

A viva voce presentation (part of final dissertation above): Week commencing

29 May 2017

## 5.2 Final Submission

The final submission for your project assesses your ability to communicate a coherent account of your chosen topic area. Your final presentation will include the following:

* Your exposition of the background to your project, clearly setting out the problem you investigated.
* Your explanation of the aims and objectives that you had in mind when you planned your initial activities, and your account of any changes to the objectives that occurred because of developments during the project.
* Your account of the way your project developed, which should be brief but clear, and what you did during the course of its preparation.
* Your assessment of the information you needed in order to carry out the project including written sources of information, and information collected by means of interviews, questionnaires etc.
* Your use of materials or concepts from the modules you have or are studying.
* The way in which you analysed and drew valid conclusions from the data that you collected, and the relevance of these conclusions to the original or amended objectives.

**This is worth 80*% of the final overall mark.***

Submission of the **Final** presentation by the published deadline is regarded as particularly important part of the exercise. Extensions are not approved unless the reasons are compelling. Where circumstances beyond your control impact negatively on an assessment, you can submit a claim for exceptional extenuating circumstances (EEC). For more details click on <http://www.derby.ac.uk/media/derbyacuk/contentassets/documents/academicregulations/201617/Part-I-EECs-2016-v1.pdf>

# 6 Research Methodology

## 6.1 Methodology and Research Methods

Sustainable advances in science and engineering are achieved through research. The quality of research output is highly dependant on the procedures and processes involved. The impact of the research output relies on the quality of data that has been obtained and how effective it has been analyzed to provide reliable information. The degree to which you implement this to your IES will affect the quality of your final dissertation. You must be aware of the range of competing methodologies and are able to form an opinion as to their relative strengths and weaknesses in so far as your IES is concerned.

Most supervisors will suggest a number of possible approaches to research methodology and how you can found out more about them. They will also consider with you the most appropriate methods of data collection and research techniques. You will appreciate the importance of carrying out a literature research and the University Learning Centre staff will be only too glad to assist you in this undertaking. It will involve thinking of all the alternative headings that might apply to your study and checking the library stock, and all available bibliographies, periodical indexes, abstracts and catalogues; you may also be able to use on-line searching from a number of external references on separate cards in order to facilitate re-ordering and cross-referencing.

# 7 Learning Centre Resources

## 7.1 Learning Centre Services for Projects

The University Learning Centre services will be able to provide the information resources you need for your *IES*, either directly or through loans from other libraries.

## 7.2 General

Any registered student can use any of the University site Libraries. The same general facilities, such as photocopiers, are available at each location, the same loan arrangements apply, and the on-line catalogue (OPAC) is available in each place giving information about items available on all sites. Each site library, therefore, acts as a gateway to the whole service, but is organised mainly to support subjects taught at the specific site.

## 7.3 Specialist Support

The University Library has the main book and printed journal stock on engineering and technology, science, business and management, mathematics and computing.

The Subject Advisor (Librarian) responsible for Science and Technology is **Sally Forrest**, who will be happy to help you with literature searching. Room L103 Kedleston Road Learning Centre or BM213, email [s.forrest@derby.ac.uk](mailto:s.forrest@derby.ac.uk), phone 01332 594015.

A number of in house publications are available to help with study skills and more at

<http://www.derby.ac.uk/library/study-skills>.

## 7.4 Useful Sources of Information

The electronic resources available to you are available from the Library

Information Resources page <http://www.derby.ac.uk/campus/library/>. You may

access this direct (and then put in your University username and password) or go

through UDo and select the link. A detailed list of resources is given in the

library guide.

Electronic resources include: the complete British Standards Online; specific electronic journals, journals databases such as Ebsco Electronic Journals Service and Emerald; journals indexes to widen your search such as Applied Science &

Technology Abstracts and Abstracts in New Technologies & Engineering.

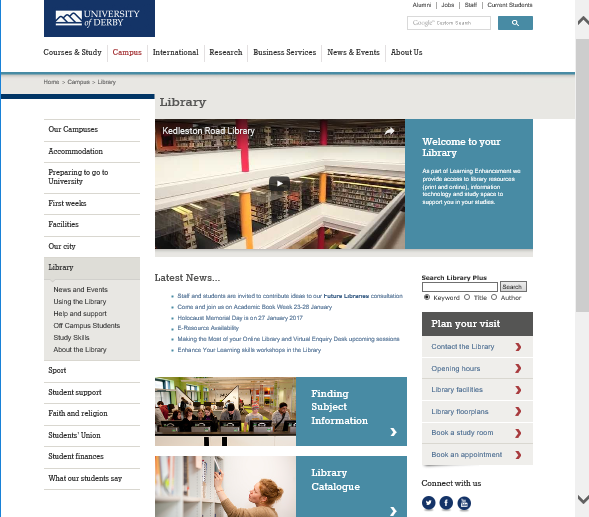
## 7.5 Obtaining Material from other Libraries

A literature search will often generate a need to obtain books and photocopies of periodical articles not available in the University of Derby libraries. This can be done by completing the inter-library loan form but limit your requests to those which are important. You are allowed up to 20 books or journal articles at a cost of £2 per item. Please make your requests in good time and assume that requests will take three weeks, though photocopies of journal articles will usually come much sooner.

## 7.6 Using other Libraries

It may be useful to visit other libraries. Generally, there is no difficulty about other libraries for reference purposes but you cannot expect to be allowed to borrow from other academic libraries. The catalogues of all University Libraries and the British Library are available from the library web page.

**Main Library Catalogue page**



## 7.7 Help

See **Sally Forrest**, details above in 7.3, if you need any help.

# 8 Useful Software Packages

|  |
| --- |
| Computing Services have a wide variety of packages running on the PC Network. These are some of the more widely used ones.  Microsoft Office Professional Autodesk Inventor  LabView Multisim  SolidWorks Ansys  Cosmos Package Cambridge Engineering Selector (CES)  Matlab/Simulink |

## 8.1 College of Engineering and Technology

In addition to the computing facilities provided by the University, the College of Engineering and Technology has an extensive range of dedicated facilities.

# 9 Final Submission of your IES

## 9.1 Introduction

This part of the *Project guide* is primarily concerned with the submission of your Report as required by the University.

Even at the planning stage of your project you should be able to work out an outline structure for the final submission which you can then refer to and possibly modify as you proceed with your activities. As your project develops you should then be able to complete certain sections in draft form to fit in with the planned structure. For instance, it should be possible for you to complete the background material at quite an early stage of your project.

Towards the end of your project there will come a time when you have to call a halt to the planning and execution, and move into the final stage in which you complete your project.

All your efforts in planning and carrying out your investigation will be wasted unless your results are written up in a way that your project can be easily understood by others. Remember that if your results are not communicated effectively they will be overlooked.

## 9.2 Report Format

Your Principal Supervisor and the Second Supervisor will be interested in the full range of activities which you have undertaken in carrying out your project. Whatever structure you select, they are likely to want to know at some time the following:

* Why you carried out the investigation?
* How you conducted it?
* What methods you used to gather your evidence?
* What you found out?

A description of what you did is in itself not enough; you will be expected to analyse the situation that you found, to evaluate the data you collected and to reach conclusions and/or make recommendations which arise out of the work that you have done.

Whatever the actual content of your investigation, the *structure* of your final submission must always be evident and should allow the findings and recommendations to be presented in a logical fashion.

## 9.3 Formal Report

In your dissertation the following structure should be followed.

***Title Page***

Include a title page, incorporating the title of your study, your name and the date the project was completed. The title should accurately reflect the nature of your study and should be brief and to the point. A main title and sub-title clarifies the purpose of the study. The contents and layout of a title page for a fictitious project appears in the following box.

|  |
| --- |
| The University of Derby  **Faculty of Arts, Design and Technology**  School of Engineering and Technology  Optimal Sensor Selection for Wind Turbine  Condition Monitoring  by  John Smith  May 2016  Submitted for in part-fulfilment of the requirements for the MSc in the Control and Instrumentation. |

***Acknowledgements and Thanks***

You may wish to acknowledge the help given to you in carrying out your project and the preparation of your final submission. If so, acknowledgements come after the title page. Acknowledgements should be in double spacing.

***Abstract***

The abstract should state clearly and concisely the topic, scope, method and conclusions reached in the project. An abstract should never exceed 200 words and may be considerably shorter. The abstract should be in single spacing. Here is an example.

*Traditional methods of document production in the University of Life are described, along with the trade union agreements covering this area. An analysis of the different types of documents produced and a survey of the aspirations of personnel involved have been conducted. Possible advances in document preparation are compared and the financial and training implication outlined, leading to a recommendation for a pilot study in 2009.*

***Table of Contents***

The table of contents provides a research tool and should be as complete as necessary to make it use to other readers. An example contents page is shown on the next page.

|  |
| --- |
| **Abstract or Executive Summary**  **Page nos**  **1. Introduction**  **1.1 Background**  **1.2 Aims and Objectives**  **1.3 Scope of Work**  **2. Literature Review**  **(May be more than one chapter)**  **3. Design**  **4. Experimental Procedure/Methodology**  **4.1 Description of above**  **4.2 Results**  **5. Analysis and Discussion**  **5.1 Analysis of Results**  **5.2 Discussion**  **6. Conclusions and Recommendations**  **References**  **Bibliography**  **List of Tables**  **List of Figures**  **Appendices** |

***List of Tables***

Each table in your project should have a table number and title at the top. The **List of Tables** gives the number, title and page number of tables in the main body of the project, but not appendices.

***List of Figures or Illustrations***

Each figure that appears in your project should have a title and figure number below the figure, and should be referred to in the text by both the number and title.

***Notation***

In projects that contain a significant number of equations and mathematical symbols, it is often helpful to provide a notation at the beginning of the project which lists the symbols together with their definition.

**Overview**

The introduction should provide the reader with a clear idea of the issue under investigation and its importance, and such information as when and where it was carried out if that is not already obvious. This section should be as brief as possible, but should provide the reader with the necessary background information to give the setting of the investigation. Bear in mind your readers and how familiar they may or may not be with the situation.

***Literature Review***

The value of a review to the readers of your project is that it explains the context and background of the study. Selection has to be made, and only books and articles which relate directly to the topic should be included. The literature review can be written first, and, if you have managed to discipline yourself sufficiently well to write up sections and sub-sections as you have completed them, much of the work of this section will be ready for revision before you begin to collect data

***Experimental Procedure or Methodology***

This section explains how the problem was investigated and how particular methods and techniques were employed. The results of the project should be included. The way the results are presented is important and tables, charts, graphs and other figures should illuminate the text. If they do not then there is no point taking up valuable space. The text, which should be written after the results have been prepared, should not duplicate information in the tables and figures, but should highlight significant aspects of the findings so that all relevant facts are presented in a way that draws the readers' attention to what is most important. Remember, that readers appreciate quality and are wearied by quantity. Be careful to limit your interpretations to what can be reasonably justified from the results. It is quite a good idea to look at the way other students have presented tables and figures.

***Analysis and Discussion***

It is often best to start this section with a re-statement of the problem before discussing how the results affect existing knowledge of the subject. If your research aimed to test certain hypotheses, then this section should demonstrate whether or not they were supported by the evidence. Any deficiencies in the research design should be mentioned, with suggestions about different approaches which might have been more appropriate. Implication for improvement of practice, if any, should also be drawn out.

***Conclusions and Recommendations***

The main conclusions of the project should be summarised here briefly and simply. Only conclusions that can be justifiably drawn from the findings should be made. There is often a great temptation to drop in an opinion for which no evidence is provided in the project and this may spoil a good project by including a throwaway remark. Before writing this section, read through the whole of the project and make a note of the key points. Readers who want a quick idea of what your research is about will look at the abstract, the introduction and certainly the summary and conclusions. This section should enable readers to understand clearly what has been done and the conclusions that have been drawn from the evidence provided. The conclusions should relate to the **aims and objectives** stated at the beginning of the project.

Any recommendations should describe a course of action to deal with the issue under investigation and should be based on the conclusions reached.

***References***

Only articles which have been cited or referred to in the project should be provided. These articles will form the list of references. Please refer to Referencing notes on separate document.

**Bibliography**

A full bibliography should also be included in your report.

**Method of Referencing**

You have an opportunity this year to use **Turnitin** as a tool to find out how to reference correctly.

|  |
| --- |
| The method of referencing used shall be the **Harvard system** as follows:  *Referencing a textbook*  In the body of the project you may use either a direct quotation or paraphrase some specific point the author is making, for example  *Quotation*:  Marks are usually lost for not referencing your work and presenting your project or project in an appropriate structure. (Harmanto 2005)  *Paraphrase:*  In his extensive research Harmanto (2005), found that majority of students who did not attend the project workshop always get the lowest grade in their Project work.  In the list of references this will appear as:  Harmanto, D (2007) *CAD Procedures*  McGraw-Hill, UK  Referencing a journal  The entries in the text of the project are as shown for textbook.  In the list of references this will appear as:  Skinner, P. (1985) ‘The Future of Professional Institutions in the Millennium’ *Construction Management*, 4(2), 245-256 |

***Appendices***

Copies of any research instruments (questionnaires, interview schedules, case studies etc) that have been used should be included in an appendix. One copy of any data collecting instrument (e.g. a questionnaire) is all that is required.

***General Style***

The general style of the project is impersonal, but this does not mean that it must be all in the passive voice. It does mean excluding the word I, and, even more importantly, such phrases as 'in my opinion'. 'In the opinion of the writer' is even worse. The two readers are interested in your evidence and not your opinion.

Clarity, simplicity of style and brevity are the cardinal virtues. Abbreviations are not recommended and even these should be given in full on the first occasion they occur, since the project may be read by someone who is unfamiliar with them. Technical terms should be avoided in the introductory and concluding sections. In other sections the use of technical terms may be inevitable, but not jargon, in the sense of unnecessary technical language which can be expressed more simply.

***Presentation***

Your project must be typed or word-processed on A4 paper. Type on one side of the paper only, in **1.5** spacing (except for the abstract and quotations within the text which must be insingle spacing), leaving a left hand margin of 30 mm and 20 mm for the right hand, top and bottom margins. All pages should be numbered.

***Headings***

As with other written communication, your project should flow logically from one point to another, and should develop in an orderly and easily understood fashion. With this aim in view, it is of great assistance if the headings and sub-headings of the various sections of the report are laid down first so that a proper framework is constructed. The writing of the full account can then be undertaken in the sure knowledge that a logical arrangement has been established. Further, this method helps to avoid the accidental omission of important points that have to be made.

***Tables and Figures***

Not all projects will have tables and figures but, if these are to be included, remember that they must be numbered, given a title as shown overleaf. Remember, carefully check the table and figure numbers before you send off your project for marking.

**Table 2.1 Typical allowable Stresses**

|  |  |
| --- | --- |
| **Application** | **Stress (KNm2)** |
| A | 10,000 |
| B | 2000 to 4000 |
| C | 600 to 2000 |
| D | 600 |
| E | 100 to 300 |
| F | less than 100 |

Tables and figures are generally numbered as follows:-

**Table/Figure** {chapter number. sequential table/figure number in the chapter}

For example, Table 2.1 would be located in Chapter 2 and would be the first table in that chapter.

***Quotations***

All quotations must be acknowledged. If you are only quoting a few words or one sentence, it will be sufficient to indicate this by using inverted commas in the main text, with the source in brackets. If words are missed out of the quotation, indicate by three full stops. If the quotation is longer than a single sentence then indent it and use single spacing.

***Binding***

**Two** comb bound copy must be submitted, both of which will be retained by the University. An embossed binding will be rejected. You may wish to produce one or more copies for yourself. The reports should be bound in hard black buckram with gold lettering on the spine and front cover board.

The final assessment format is as shown in earlier sections.

**Maximum length is 20000 words.**

Two copies of the whole report (all elements) must be submitted. One may be sent to the external examiner for assessment and when returned, retained in the University, the other copy will be used for internal assessment and thereafter will be available for collection by the student following the Examination Board.

In the case of industry-based projects, it is advised that a further copy is produced and presented to your employer or sponsor. Students will require to retain at least a draft copy of the report to prepare for the project interview and defend the report during the interview.

Diagrams and graphs etc. may be plotted, printed or hand-drawn. Graphics produced by computers should have as high a resolution as possible. Pages must be clearly numbered.

All figures (graphs, photographs, engineering drawings etc.) should have a Figure number and caption, and should be specifically referred to in the text. Figures not mentioned in the text should not be included. The same applies to tables.

Both copies of the report should be essentially identical in quality, so photographs etc. must not be photocopied unless the copy is essentially as good as the original in resolution (and colour).

The text should be cross-referenced adequately. For example, if calculations yield a result which is used in another section, the later use must refer to the section where the original result was obtained.

# 10 Plagiarism Statement

What is plagiarism?(taken from UoD website)  
Plagiarism is the passing off of another person's thoughts, ideas, writings or images as your own work. Plagiarism can also include copying directly from another source, or paraphrasing the text of another author without acknowledging them. Another aspect of plagiarism is described as collusion, which is where you've worked with someone else to produce a piece of work, but then submitted it as you own individual work. See also details at: <http://www.derby.ac.uk/media/derbyacuk/contentassets/documents/academicregulations/academic-offences.pdf>

Plagiarism and collusion behaviour can often happen unintentionally and can be avoided when you become more familiar with good academic practice and referencing. For more information about the academic regulations please take a look at

<http://www.derby.ac.uk/about/organisation/academic-regulations/>

# 11 Frequently Asked Questions

In learning about how to do a Project, there are several issues that often crop up. Here, the most common questions are dealt with. If you have a question relating to Project practice that is not here, please e-mail it to your Project Co-ordinator so that we can share it with other colleagues and students.

* **What is the difference between aims and objectives?**

Aims are a general statement about what you wish to achieve, objectives are specific measurable targets that can be ticked off once achieved.

* **What is the difference between method and methodology?**

Many people use the word methodology when they mean method, probably because it is a longer word and sounds more authoritative. However, the words are not interchangeable as methodology refers the study of method, method means the techniques used to do something. Projects should contain a discussion of methodology, which is about how you choose the methods and why. It should also contain a description of the methods used to carry out the research. Incidentally, it is not good practice to refer to literature searching as a research method.

* **What is a literature search and why do I have to do one?**

In order to contribute anything sensible to our collective knowledge in a subject, it is first necessary to understand the current state of knowledge in that field. The literature on a subject records progress in that subject. The literature section in Projects should summarise and critically review the most important work in a field. The basis of any critical review is the evaluation of the quality of the research. Literature should be grouped together under themes and some attempt should be made to impose a structure into the report of the literature. Frequently, research studies involve pulling disparate aspects of the literature together. While you may not find anything on your topic, you may find lots on two or three separate aspects of your topic that you can then pull together in your literature review section.

* **In reviewing literature, how do you tell good papers from bad ones?**

Good papers tend to appear in scientific refereed journals. But beware! Many magazines call themselves journals because they think it sounds better. Magazines are designed to sell advertising space to targeted and highly specific market sectors. Academic journals are intended to record progress in a particular field. The key thing about a good journal is that it should be refereed. This means that all papers submitted to the journal are sent by the editors to experts in the field. These experts review the paper for scientific quality and robustness. If their criticism is major, the paper will be rejected for publication. The higher quality journals reject more papers than they publish, but it can be difficult to find the rejection rates. The highest quality journals publish their rejection rates, and their editors will be glad to tell you what the rejection rate is. If the author's identity is concealed from the referees, and vice versa, the process is called "double-blind" refereeing. Having established whether the journal is of an appropriate quality, the paper itself can be judged by the extent to which it makes clear what the researcher did in carrying out the work. Many papers do not report the results of research but simply form a record of what the author thinks about some aspect of the subject. Remember, if you cannot determine from the paper what research has actually been carried out by the author, it is the author's fault, not yours.

* **What does a research question look like?**

A research question builds upon your initial statement about what you want to study, and explains it in such a way that variables are identified and the nature of the data that you intend to collect is clear. It should also make clear how the data will be analysed.

* **What happens if I want to change the title of my project?**

If you decide early in the year (first couple of weeks) that you want to change your project you should see the Project co-ordinator immediately and discuss with him the possibility of changing. In general if you have a suitable alternative project and there is a supervisor available you should be able to change.

* **My project is not going anywhere and I am afraid I will fail?**

How successful projects are going to be is difficult to assess when you first start working on them. You might find that someone else has already done the work you were going to do or that the invention you had planned has already been found not to work. If you feel that your project is becoming bogged down and that you cannot progress it you should see you supervisor immediately and negotiate a change in the direction of the project. You may have to submit an amended Gantt chart, but if you have filled in your Project Meeting Logs the moderator and external examiner will see immediately why you had to change.

* **I cannot agree with my supervisor?**

Your supervisor has been assigned to you on the basis of their academic specialisms which enable them to supervise a project in your area. However, disagreements do arise and you should see the Project Coordinator concerning these. Remember that you cannot appeal against academic judgement unless you suspect there has been a procedural mistake.

* **Where do I hand in my work?**

All work should be submitted as instructed in the assignment brief. It should be either submitted electronically or handed in through the learning centre in the normal way with a completed Assignment form and the relevant tutor's name clearly marked. Late submissions carry the same penalty as late assignments.

* **Do I have technician support?**

If you are manufacturing parts for you project you can submit suitable drawings (to BS 308) to the Chief Technician who will manufacture the parts for you or assign a technician to help in their manufacture. Remember that technicians have their own work to do so that you need to submit your drawings early if you need the part for testing equipment. You cannot necessarily expect a turn around of one day.

* **I need confidentiality, how do I obtain a confidentiality agreement?**

If you are completing an industrial project and wish the work to be kept confidential you should obtain a confidentiality agreement from the Faculty Office. These ensure that your work is not published.

* **How often should I meet my supervisor?**

This is between yourself and your supervisor and is normally between fortnightly and monthly on a regular basis. If you feel that you are not seeing your supervisor often enough, first discuss this with your supervisor and then see the Project Coordinator.

# 12 Project Binding

The print bureau at Markeaton Street provides a binding service with subsidised prices. More information can be found at <http://www.derby.ac.uk/campus/facilities/print-bureau/>

**REMEMBER - YOU NEED TO ALLOW ENOUGH TIME FOR BINDING, AS THIS MAY NOT BE AVAILABLE THE SAME DAY DUE TO HIGH DEMAND AROUND SUBMISSION DEADLINES.**

# Appendix A: Meeting Log Sheet

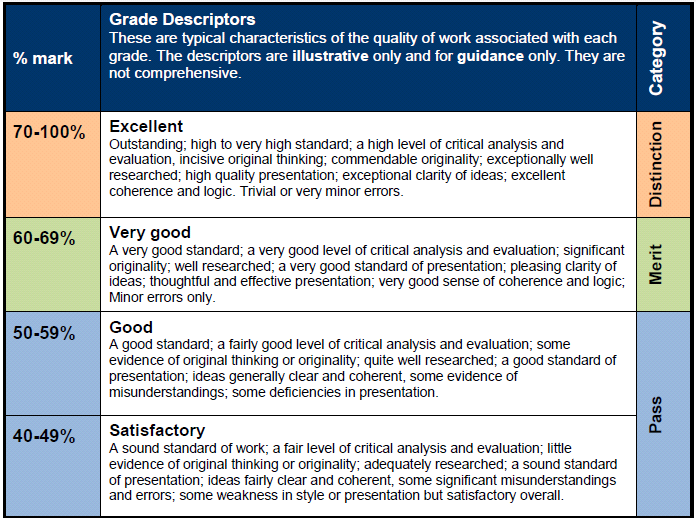
**(**to be completed for each formal meeting between student and supervisor)

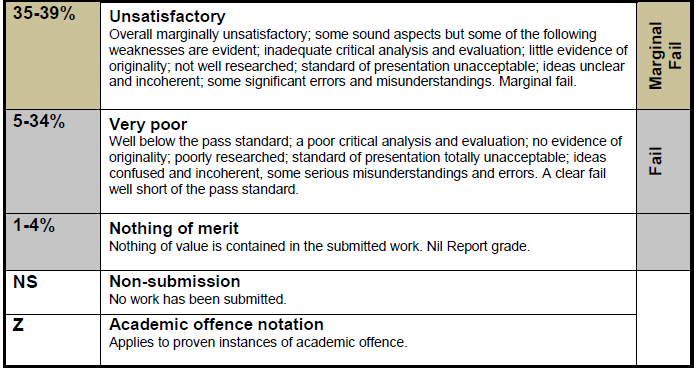
|  |
| --- |
| Student’s signature: Supervisor’s signature:  Date: Time: From To |
| Student’s summary:  Progress since last meeting  Issues to be discussed: |
| Supervisor’s comments: |

Supervisor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_

Student’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_

# Appendix B: Postgraduate Grading Scale





# Appendix C: Risk Assessment Form

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment Reference | | | | | | | | | |  | | | | | | | | | | | | | |
|  | | | | | | | | | |  | | | | | | | | | | | | | |  | |
| Activity assessed | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | |
| Persons who may be affected by the activity | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |  |  |  | | | | | | | | | | | | | | |
| SECTION A : Initial Assessment Overview | | | | | | | | | | | | | | |
| *Consider the activity or work area and identify if any of the hazards listed below are significant.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Fall of person | | |  | 7 | | Machinery | | | |  | 13 | | Electricity | | | | |  | 19 | | Substances | | | | |  | 25 | | Drowning |  |
| 2 | Fall of objects | | |  | 8 | | Tools/Equipment | | | |  | 14 | | Noise or Vibration | | | | |  | 20 | | High Pressure | | | | |  | 26 | | Psychological effects |  |
| 3 | Tripping/Slipping | | |  | 9 | | Mobile work equipment | | | |  | 15 | | Hot / Cold Surfaces | | | | |  | 21 | | Fire/ explosion | | | | |  | 27 | | Human error |  |
| 4 | Manual handling operations | | |  | 10 | | Mechanical lifting equipment | | | |  | 16 | | Workstation –  layout / space | | | | |  | 22 | | Lighting | | | | |  | 28 | | Violence |  |
| 5 | Repetitive work | | |  | 11 | | Display screen equipment | | | |  | 17 | | Radiation | | | | |  | 23 | | Confined space | | | | |  | 29 | | Peripatetic / lone working |  |
| 6 | Housekeeping / waste material | | |  | 12 | | Sharp objects | | | |  | 18 | | Temperature / weather | | | | |  | 24 | | Buildings & glazing | | | | |  | 30 | | Other(s) |  |
|  | | | | | | | | | | | |  | |  | | | | |  | | | | | | | | |
| SECTION B : Second Stage Assessment | | | | | | | | | | | | |  |  | | | | | [S = Severity](file://E:\A\1213\MSc%20Project\Risk%20Evaluation%20matrix.doc) | | | | | | | | |
| ***For each hazard identified in Section A complete Section B***[***L = Likelihood***](file://E:\A\1213\MSc%20Project\Risk%20Evaluation%20matrix.doc) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hazard  No. | | Hazard  Description | | | | | | | EXISTING CONTROL MEASURES | | | | | | | | | | | | | | ***S*** | | L | | | | RESIDUAL RISK | | |
|  | |  | | | | | | |  | | | | | | | | | | | | | |  | |  | | | |  | | |
| No. of Section B Continuation sheets used: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | |
| Assessor(s) | | |  | | | | | | | | | | | | | | | Signed | | | Industrial Supervisor: | | | | | | | | | | |
| Date of Assessment | | | | | |  | | Revision No. | | | | | | |  | | | Students: | | | | | | | | | | |

# Appendix D: University of Derby Policy and Code of Practice on Research Ethics

Research Ethics Policy and code of practice relates to research activities undertaken by all staff, and students pursuing undergraduate (UG), postgraduate taught (PGT), postgraduate research (PGR) or postgraduate professional (PGP) awards or by a visiting research worker. (taken from UoD website)

All research undertaken by staff and students under the aegis of the University of Derby should only be undertaken after effective consideration of its ethical implications. Full regard of the University's Code of Practice on Research Ethics should be given and it can found at <http://www.derby.ac.uk/research/uod/researchethicsandintegrity/researchethics/>

**Request for Ethical Approval for Individual Study / Programme of Research by University Students**

***Please complete this form and return it to your Independent Studies Supervisor or Co-ordinator as advised by local guidance. Feedback on your application will be via your Independent Studies Supervisor or Co-ordinator***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***1. Your Name:*** |  | | ***2. Programme name and code*** | |
| ***3. Contact Info*** | ***Email:***  ***Tel No.***  ***Address:*** | | |
| ***4. Module name and code*** | |  | |
| ***5. Name of project supervisor (Director of Studies)*** | | | |
| ***6. Title or topic area of proposed study*** | | | |
|  | | | |
| **7. What is the aim and objectives of your study?** | | | |
|  | | | |
| ***8. Brief review of relevant literature and rationale for study (attach on a separate sheet references of approximately 6 key publications, it is not necessary to attach copies of the publications)*** | | | |
|  | | | |
| **9. Outline of study design and methods** | | | |
|  | | | |
| **10. Research Ethics**  **PROPOSALS INVOLVING HUMAN PARTICIPANTS MUST ADDRESS QUESTIONS 10 - 14.**  **Does the proposed study entail ethical considerations Yes / No (please circle as appropriate)**  **If ‘No’ provide a statement below to support this position.**  **If ‘Yes’ move on to Question 11.** | | | |
| **11. Ethical Considerations: Please indicate how you intend to address each of the following in your study. Points a - i relate particularly to projects involving human participants.**  **Guidance to completing this section of the form is provided at the end of the document.**   * **Consent** * **Deception** * **Debriefing** * **Withdrawal from the investigation** * **Confidentiality** * **Protection of participants** * **Observation research [complete if applicable]** * **Giving advice** * **Research undertaken in public places [complete if applicable]** * **Data protection** * **Animal Rights [complete if applicable]** * **Environmental protection [complete if applicable]** | | | |
| **12. Sample: Please provide a detailed description of the study sample, covering selection, number, age, and if appropriate, inclusion and exclusion criteria.** | | | |
|  | | | |
| **13. Are payments or rewards/incentives going to be made to the participants? If so, please give details below.** | | | |
|  | | | |
| **14. What study materials will you use? (Please give full details here of validated scales, bespoke questionnaires, interview schedules, focus group schedules etc and attach all materials to the application)** | | | |
|  | | | |
| ***15. What resources will you require? (e.g. psychometric scales, equipment, such as video camera, specialised software, access to specialist facilities, such as microbiological containment laboratories).*** | | | |
|  | | | |
| **16. Have / Do you intend to request ethical approval from any other body/organisation ? Yes / No (please circle as appropriate)**  **If ‘Yes’ – please give details below.** | | | |

|  |
| --- |
| **17. The information supplied is, to the best of my knowledge and belief, accurate. I clearly understand my obligations and the rights of the participants. I agree to act at all times in accordance with University of Derby Code of Practice on Research Ethics** <http://www.derby.ac.uk/research/ethics/policy-document>  **Date of submission………………………………..**  **Signature of applicant……………………………………………**  **Signature of project supervisor (Director of Studies) ……………………………………………** |
| **For Committee Use Reference Number (Subject area initials/year/ID number)………………….**  Date received……………… Date approved ……………. Signed………………………  Comments |

**PLEASE SUBMIT ALONG WITH THIS APPLICATION THE FOLLOWING DOCUMENTATION WHERE APPROPRIATE (please tick to indicate the material that has been included or provide information as to why it is not available):**

Questionnaires/Interview schedules

Covering letters/Information sheets

Briefing and debriefing material

Consent forms for participants

**Advice on completing the ethical considerations aspects of a programme of research**

**Consent**

Informed consent must be obtained for all participants before they take part in your project. The form should clearly state what they will be doing, drawing attention to anything they could conceivably object to subsequently. It should be in language that the person signing it will understand. It should also state that they can withdraw from the study at any time and the measures you are taking to ensure the confidentiality of data. If children are recruited from schools you will require the permission, depending on the school, of the head teacher, and of parents. Children over 14 years should also sign an individual consent form themselves. If conducting research on children you will normally also require Criminal Records Bureau clearance. You will need to check with the school if they require you to obtain one of these. It is usually necessary if working alone with children, however, some schools may request you have CRB clearance for any type of research you want to conduct within the school. Research to be carried out in any institution (prison, hospital, etc.) will require permission from the appropriate authority.

**Covert or Deceptive Research**

Research involving any form of deception can be particularly problematical, and you should provide a full explanation of why a covert or deceptive approach is necessary, why there are no acceptable alternative approaches not involving deception, and the scientific justification for deception.

**Debriefing**

How will participants be debriefed (written or oral)? If they will not be debriefed, give reasons. Please attach the written debrief or transcript for the oral debrief. This can be particularly important if covert or deceptive research methods are used.

**Withdrawal from investigation**

Participants should be told explicitly that they are free to leave the study at any time without jeopardy. It is important that you clarify exactly how and when this will be explained to participants. Participants also have the right to withdraw their data in retrospect, after you have received it. You will need to clarify how they will do this and at what point they will not be able to withdraw (i.e. after the data has been analysed and disseminated).

**Protection of participants**

Are the participants at risk of physical, psychological or emotional harm greater than encountered ordinary life? If yes, describe the nature of the risk and steps taken to minimise it.

**Observational research**

If observational research is to be conducted without prior consent, please describe the situations in which observations will take place and say how local cultural values and privacy of individuals and/or institutions will be taken into account.

**Giving advice**

Students should not put themselves in a position of authority from which to provide advice and should in all cases refer participants to suitably qualified and appropriate professionals.

**Research in public places**

You should pay particular attention to the implications of research undertaken in public places. The impact on the social environment will be a key issue. You must observe the laws of obscenity and public decency. You should also have due regard to religious and cultural sensitivities.

**Confidentiality/Data Protection**

You must comply with the Data Protection Act and the University's Good Scientific Practice. This means:

* It is very important that the Participant Information Sheet includes information on what the research is for, who will conduct the research, how the personal information will be used, who will have access to the information and how long the information will be kept for. This is known as a 'fair processing statement.'
* You must not do anything with the personal information you collect over and above that for which you have consent.
* You can only make audio or visual recordings of participants with their consent (this should be stated on the Participant Information sheet)
* Identifiable personal information should only be conveyed to others within the framework of the act and with the participant's permission.
* You must store data securely. Consent forms and data should be stored separately and securely.
* You should only collect data that is relevant to the study being undertaken.
* Data may be kept indefinitely providing its sole use is for research purposes and meets the following conditions:
* The data is not being used to take decisions in respect of any living individual.
* The data is not being used in any which is, or is likely to, cause damage and/or distress to any living individual.
* You should always protect a participant's anonymity unless they have given their permission to be identified (if they do so, this should be stated on the Informed Consent Form).
* All data should be returned to participants or destroyed if consent is not given after the fact, or if a participant withdraws.

**Animal rights.**

Research which might involve the study of animals at the University is not likely to involve intrusive or invasive procedures. However, you should avoid animal suffering of any kind and should ensure that proper animal husbandry practices are followed. You should show respect for animals as fellow sentient beings.

**Environmental protection**

The negative impacts of your research on the natural environment and animal welfare, must be minimised and must be compliant to current legislation. Your research should appropriately weigh longer-term research benefit against short-term environmental harm needed to achieve research goals.