

# Module Assessment Guide

## Research in Computing

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### Administrative Data

Assessment of this module is based on **TWO** written coursework assignments which comprise 20% and 80% of the final grade awarded respectively.

Deadlines for submission of assignments (as published in the School portal):

1. Research Question (20% ): **03/3/2017 @ 5pm**. You also need to prepare a 5 minute presentation pitch (video to be uploaded) by **10.03.2017 @ 5 pm**.
2. Research Proposal (80%): **07/Apr/2017 @ 5pm**.

Should any student miss a piece of assessment with a valid reason, she/he will be required to fill in a personal circumstances form (PCF). Personal circumstances forms are available at the School of Computing home page in the student portal (no hard copies are available from the Programme Coordinator office).

Both assignments must be electronically submitted as single PDF documents using the Turnitin dropbox provided in the module page. Please:

- do not use a standard cover sheet but ensure that your name in full (as per NCI official documents) and student number are clearly visible on the front page; and
- name your files starting with the first letter of your given name followed by the first three letters of your surname, your student id, a dash, and the coursework number preceded by a 'd'. No spaces should be included in the filename. That is to say, when "Mary Murphy" with student id 15123456 submits her second coursework, she should name the file `mmur15123456-d2.pdf`.

**All coursework will be electronically screened for evidence of academic misconduct (copying and collusion). Any student who is found guilty of misconduct will be awarded a mark of zero and considered for disciplinary action.**

The mark for the coursework represents 100% of your overall mark for this module.

This module assessment guide has been designed to facilitate the understanding of the scope for the assessment of the “Research in Computing” module as part of the MSc degrees in the School of Computing at the National College of Ireland. It is based on similar attempts at different institutions throughout the world.

## 1 Module Introduction

It is expected that the knowledge and skills gained from the module will contribute to scholarship and to the generation of innovative solutions to intuitive research questions. Specifically, the learning outcomes of this module are:

- LO1** Propose a research question and identify its implications with regard to the choice of subject.
- LO2** Propose research objectives and identify possible deliverables
- LO3** Create a literature review which situates the work with regard to previous work, a research and development design and methodology
- LO4** Critically assess and select methods for addressing the research question, including originality considerations.
- LO5** Demonstrate the ability to write a comprehensive research plan that explores research methods and deliverables for a specific subject in computing.

All relevant materials for the module and indeed for the coursework are accessible online at the Moodle module page:

<https://moodle.ncirl.ie/course/view.php?id=1995>

It is duly noted that both assignments should comply with the presentation style of this module and use the L<sup>A</sup>T<sub>E</sub>X document preparation system. Tutorials on L<sup>A</sup>T<sub>E</sub>X are provided in the Moodle module page.

## 2 Style guidelines

The following guidelines are not exhaustive, but should help you with general and stylistic points. Both pieces of work must be referenced, with a bibliography at the end, preferably created using the BIB<sub>T</sub>E<sub>X</sub> tool.

**References** All concepts, figures and other evidence, using the ‘Harvard’ referencing style as briefly explained below. In the text of your essay you should refer to the surname only of the author(s), and then the date of publication, and the page number: e.g. (Nolan 1983:303), especially for quotes.

**Bibliography** At the end of every assignment, you should have a section marked “References” where all your references should be listed in full and alphabetically by surname, e.g:

- Nolan P. (1983), ‘The Firm and Labour Market Behaviour’, in Bain G. (ed), Industrial Relations in Britain (Blackwell, Oxford).
- McIlroy J. (1988), Trade Unions in Britain Today (Manchester University Press).

Other sorting methods are acceptable depending on the BIB<sub>T</sub>E<sub>X</sub> style employed. Additional guidelines on referencing can be obtained directly from the library at:  
<http://ncirl.libguides.com/referencing>.

**Academic writing** The Learning Development Service of the National College of Ireland can assist you with academic writing, reading, researching and exam techniques. Please write to Mike Goldrick, the Learning Development Officer at NCI, at [michael.goldrick@ncirl.ie](mailto:michael.goldrick@ncirl.ie)

**Statistics** When referring to data and statistics, use rounded numbers in the text. For example, if the cited figure is 13,201, either put 13,000 or ”just over 13,000”. Unless there is a good reason, you should avoid decimal places - so put 49% rather than 48.8%.

**Plagiarism** Do not copy other student’s coursework irrespective of cohort, course, or institution. **This is a disciplinary offence.**

**Quotes** Do not over-quote. Stringing quotes together, however good they are, is no substitute for developing your argument in your own words, with your own emphasis. A judicious use of quotes, where it enhances the point you wish to make, is all that is needed. Where you do quote, do not quote paragraphs; often single sentences, or even phrases, contain the essential point you want. You should never insert bits of the literature into your assignments without using this proper system of quotation or acknowledgement as this may be interpreted as plagiarism by the marker. Nonetheless, do keep full quotes to a minimum. Where you refer to an author’s work, you should still give the full reference: author, date, pages, etc. particularly in complete monographs or books.

**Facts** Avoid assertions, vagueness, and value-judgements.

**Review** **Check your grammar and spelling.** Do not use paragraphs either too short or too long; each should be a coherent unit.

### 3 Assignments

The assessment of this module is based on coursework only. It is **TWO** written coursework assignments which comprise 20% and 80% of the final grade awarded respectively.

1. Research Question: 20% weight
2. Research Proposal: 80% weight

#### 3.1 Research Question

The first assignment entails the definition of the research question, key component of the capstone research project. This assignment ought to include the following components:

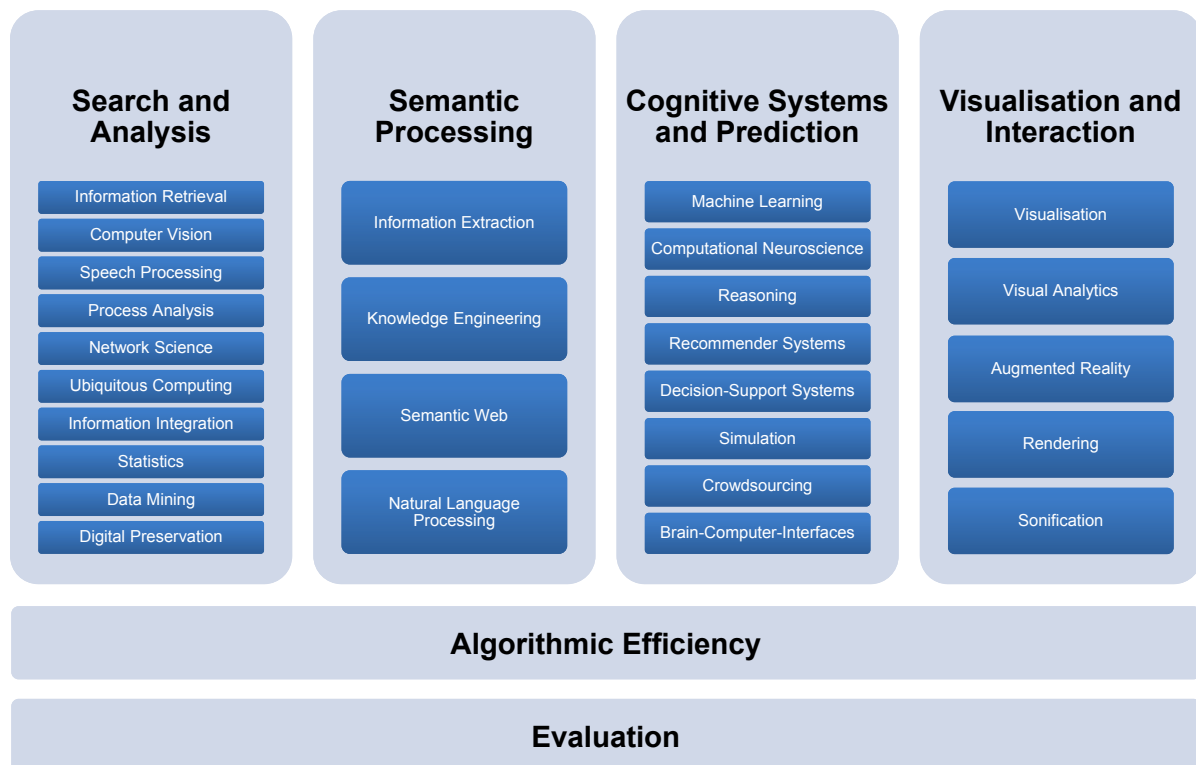


Figure 1: Some possible high-level topics/areas for data analytics. Extracted from final presentation slides of Conquering Data project, available at <http://www.conqueringdata.com>.

**Title** Choose a title that encompasses the specific topic within the area chosen.

**Area** Select the area within data analytics that you will be addressing. You may use the “Conquering Data Challenges” slide as shown in the figure above for inspiration. Feel free to expand and find additional areas of interest.

**Question** Phrase your research question addressing the specific topic and the measurable side.

**Value** Explain why this question is worth investigating and how it will contribute to knowledge in the field of data analytics.

**Justification** Describe why the question is feasible (tools), clear (measurable), significant, and ethical. Cite the key 3-5 sources (journal articles/conference papers/patents) you are basing your research question on.

**References** Include the citations to the key 3-5 sources using the Harvard style, as bibliography at the end of the document using the automatic BIBTEX feature.

**This entire coursework has a maximum page limit of 2 pages. You must use L<sup>A</sup>T<sub>E</sub>X and the following L<sup>A</sup>T<sub>E</sub>X template that is provided to you on the school portal:**

```
% -----
% Article Class (This is a LaTeX2e document) *****
% -----
\documentclass[10pt]{article}
\usepackage[british,UKenglish]{babel} %% Language
\usepackage[a4paper, margin=1in]{geometry} %% margins
\usepackage{natbib} %% References
\usepackage[a4paper,bookmarks=true, colorlinks=false]{hyperref} % Links - must be last package

\begin{document}

\title{My First Coursework}%
\author{Mary Murphy \\\ 15123456 \\\ MSc in Data Analytics}%
\date{\today}%
% -----
\maketitle
% -----
\paragraph{Area} Select the area within data analytics using
the “Conquering Data Challenges” slide.

\begin{quote}
\emph{No sit esse appetere disputando. Eu has quaeque
blandit vulputate. Reque delicatissimi has ad, eam dicit
philosophia at, eros noster et quo. Nostrum delectus te
pri. Nec ex ignota admodum.}
\end{quote}

\section{Value}
Lorem ipsum dolor sit amet, ut veri deleniti eloquentiam sea.
Ea commodo aperiam complectitur pri, usu et case dolore. Vel ad
quidam regione percipitur, est ut possit bonorum persecuti.
Quis utinam offendit eu usu, eu accusan disputando per, id
cibo reprehendunt sit. In melius legendos corrumpit pro.
```

```
\section{Justification}
```

Lorem ipsum dolor sit amet, ut veri deleniti eloquentiam sea~\citep{FengB16}. Ea commodo aperiam complectitur pri, usu et case dolore. \citet{KuneKARB16} ad quidam regione percipitur, est ut possit bonorum persecuti. Quis utinam offendit eu usu, eu accumsan disputando per, id cibo reprehendunt sit~\citep{BeloglazovB15,GomesCT15}. In melius legendos corrumpit pro.

Eos dico dignissim voluptatibus et, duo nisl cibo ut. Diceret periculis posidonium cum eu. \citet{GomesCT15} regione nam ex. Vix id viris phaedrum. Pri augue cetero probatus ut.

```
\bibliographystyle{dcu}
```

```
\bibliography{mmur}
```

```
\end{document}
```

```
% -----
```

The accompanying BIB<sub>T</sub>E<sub>X</sub> file (*mmur.bib*) is:

```
@ARTICLE{BeloglazovB15,
  author      = {Anton Beloglazov and
                 Rajkumar Buyya},
  title       = {OpenStack Neat: a framework for dynamic and energy-efficient consolidation
                 of virtual machines in OpenStack clouds},
  journal     = {Concurrency and Computation: Practice and Experience},
  volume      = {27},
  number      = {5},
  pages       = {1310--1333},
  year        = {2015},
  doi         = {10.1002/cpe.3314},
}

@ARTICLE{FengB16,
  author      = {Guofu Feng and
                 Rajkumar Buyya},
  title       = {Maximum revenue-oriented resource allocation in cloud},
  journal     = {{IJGUC}},
  volume      = {7},
  number      = {1},
  pages       = {12--21},
  year        = {2016},
  doi         = {10.1504/IJGUC.2016.073772},
}

@ARTICLE{GomesCT15,
  author      = {Danielo G. Gomes and
                 Rodrigo N. Calheiros and
                 Rafael Tolosana{-}Calasanz},
  title       = {Introduction to the special issue on Cloud Computing: Recent Developments
                 and Challenging Issues},
  journal     = {Computers {\&} Electrical Engineering},
  volume      = {42},
```

```
pages      = {31--32},
year       = {2015},
doi        = {10.1016/j.compeleceng.2015.03.008},
}
```

```
@ARTICLE{KuneKARB16,
  author    = {Raghavendra Kune and
              Pramodkumar Konugurthi and
              Arun Agarwal and
              Chillarige Raghavendra Rao and
              Rajkumar Buyya},
  title     = {The anatomy of big data computing},
  journal   = {Softw., Pract. Exper.},
  volume    = {46},
  number    = {1},
  pages     = {79--105},
  year      = {2016},
  doi       = {10.1002/spe.2374},
}
```

## 3.2 Research Proposal

This the second coursework worth 80% of the final mark. It must include the following components:

**Abstract** Renders a summary of your proposal and therefore should introduce the topic, state what was carried out, and outline the key points. It should be ~150 words. References are not cited in an abstract.

**Contents table** Enables the reader to easily find the information they require. It should be automatically generated by L<sup>A</sup>T<sub>E</sub>X.

**Introduction** Should provide information on the background to the topic. This section must:

- present the general context of your question within the sphere of data analytics;
- convey your research question and define the key terms; no need to go into specifics here;
- motivate the purpose of the literature review why is it important to research the chosen topic?
- outline what the general findings of the review are this is where you can give the key element of your argument; and,
- describe the structure of your document give the exact headings of each section and outline the key argument points you will be making in each section.

This section should be ~ 1 page in length.

**Literature review** Must compare, contrast and relate to previous work, clearly identify the research question(s), enumerate the objectives of the work, and specify the foreseen contributions. This section must:

- introduce each section by outlining the key argument points that you will be covering;
- finish each section with a brief conclusion of what you have covered and then link to the next section by outlining what you will be discussing next;
- ensure that each section heading exactly matches what the outlined contents in the introduction and that the argument points also match;
- present a logical order of the reviewed sources;
- have descriptive section headings (not vague or too simplistic/general e.g. “data analytics”);
- critically contrast at least two sources in each paragraph, as opposed to just ‘reciting’ what the articles say. Every paragraph should explain the significance of the articles are in the context of your own research question;

- ensure there is consistent referral back to the research question do not be afraid to consistently remind the reader why a point is relevant in the context of your own question; and,
- Make sure there are no extended sections where the sources are not mentioned all comments and analyses should be in the context of discussing the sources.

Overall the literature survey should not consist of a series of paragraphs beginning, ‘Jones/Smith argues....’. Focus upon concepts, issues, cases, with reference to authors, and then critically contrast them, clearly highlighting advantages and shortcomings.

The literature review must finish identifying the research niche and the expected contribution of the research.

This section should be ~ **3-4** pages in length and contain some 20 references, mostly using **recent** academic articles from reputable journals and/or conferences (see ‘Material’ at the Research in Computing module for some key specific journals). The complete list of computing databases and journals is available from the NCI Library at: <http://ncirl.libguides.com/computing/databasesandjournals>

**Research method and specification** Must describe your proposed methodological approach to the research as well as the expected/next research steps to bring your research project to completion. This section must:

- provide a specification to describe the techniques analysis methods that will eventually underlie the implementation;
- furnish a complete analysis and design documentation in order to explain each of the major design decisions and choices to be made. Consider using software engineering diagrams to illustrate your proposed approach e.g. class and object diagrams, component diagrams, deployment diagrams, CRC cards, activity diagrams, communication diagrams, statecharts, and/or sequence diagrams; and,
- include a project plan which specifies the expected tasks to be carried out during the capstone project semester. It should have a **Gantt chart** with the related dependencies.

This section should be ~ **2-3** pages in length.

**This entire coursework has a maximum page limit of 10 pages. You must use L<sup>A</sup>T<sub>E</sub>X and the following L<sup>A</sup>T<sub>E</sub>X template that is provided to you on the school portal:**

```
% -----
\documentclass[12pt,a4paper]{article}

\usepackage[british,UKenglish]{babel} %% Language
\usepackage[a4paper, margin=1in]{geometry} %% margins
\usepackage[natbib] %% References
\usepackage[a4paper,bookmarks=true, colorlinks=false]{hyperref} % Links - must be last package

\begin{document}

\title{My Second Coursework}%
\author{Mary Murphy \ \ 15123456 \ \ MSc in Data Analytics}%
\date{\today}
\maketitle

\begin{abstract}
Lorem ipsum dolor sit amet, ut veri deleniti eloquentiam, eu accumsan
disputando per, id cibo reprehendunt. In melius legendos corrumpit pro.
Eos dico dignissim voluptatibus et, duo nisl cibo ut. Diceret periculis
```

posidonium cum eu. Regione nam ex. Vix id viris phaedrum. Pri augue  
cetero probatus ut.  
\end{abstract}

% TOC  
\tableofcontents

\section{Introduction}

Lorem ipsum dolor sit amet, ut veri deleniti eloquentiam sea~\citep{FengB16}.  
Ea commodo aperiam complectitur pri, usu et case dolore. \citet{KuneKARB16}  
ad quidam regione percipitur, est ut possit bonorum persecuti. Quis utinam  
offendit eu usu, eu accumsan disputando per, id cibo reprehendunt  
sit~\citep{BeloglazovB15,GomesCT15}. In melius legendos corrumpit pro. Eos  
dico dignissim voluptatibus et, duo nisl cibo ut. Diceret periculis posidonium  
cum eu. \citet{GomesCT15} regione nam ex. Vix id viris phaedrum. Pri augue  
cetero probatus ut.

\section{Literature Review}

\label{ric:litreview} % use labels to point to parts of your work

Lorem ipsum dolor sit amet, ut veri deleniti eloquentiam sea~\citep{FengB16}.  
Ea commodo aperiam complectitur pri, usu et case dolore. \citet{KuneKARB16}  
ad quidam regione percipitur, est ut possit bonorum persecuti. Quis utinam  
offendit eu usu, eu accumsan disputando per, id cibo reprehendunt  
sit~\citep{BeloglazovB15,GomesCT15}. In melius legendos corrumpit pro. Eos  
dico dignissim voluptatibus et, duo nisl cibo ut. Diceret periculis posidonium  
cum eu. \citet{GomesCT15} regione nam ex. Vix id viris phaedrum. Pri augue  
cetero probatus ut.

\section{Research Method and Specification}

Lorem ipsum dolor sit amet, ut veri deleniti eloquentiam sea~\citep{FengB16}.  
Ea commodo aperiam complectitur pri, usu et case dolore. \citet{KuneKARB16}  
ad quidam regione percipitur, est ut possit bonorum persecuti. Quis utinam  
offendit eu usu, eu accumsan disputando per, id cibo reprehendunt  
sit~\citep{BeloglazovB15,GomesCT15}. In melius legendos corrumpit pro.  
Eos dico dignissim voluptatibus et, duo nisl cibo ut. Diceret periculis  
posidonium cum eu. \citet{GomesCT15} regione nam ex. Vix id viris phaedrum.  
Pri augue cetero probatus ut.

% references

\bibliographystyle{dcu}

\bibliography{mmur}

\end{document}

% -----

### 3.2.1 Oral Presentation

There is a short individual oral presentation on the second assignment that students are required to deliver on the final day of the teaching week. This **10-minute** presentation should give insight into some aspects of the student's research interests and should be prepared to answer questions from the audience. This will be assessed by the module coordinator and possibly by other staff members of the School of Computing.

The presentation should use visual aids as appropriate including slides (PowerPoint, L<sup>A</sup>T<sub>E</sub>X Beamer,...).

The presentation will be assessed for

- Coverage and Accuracy
- Structure and Timing
- Clarity and Style
- Use of Visual Aids
- Answers to Questions

Worth 80% of the final mark, this coursework will be graded using the marking grid shown in the following page.

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MARKING GRID – Second Assignment, Research in Computing 2015-16						
ASSESSMENT CRITERIA	EXCELLENT	COMMENDABLE	GOOD	SATISFACTORY	THRESHOLD	FAIL
Review of literature and rationale for research. (40% weight)	Excellent critical analysis of substantive and relevant literature leading to compelling rationale for the proposed research. (Mark range 32-40)	Very good critical analysis of substantive and relevant literature leading to convincing rationale for the proposed research. (Mark range 28-32)	Good analysis of relevant literature leading to clear rationale for the proposed research. (Mark range 24-28)	Adequate analysis of mostly relevant literature leading to an adequate rationale for the proposed research. (Mark range 20-24)	Some review of some relevant literature but limited evidence of understanding and weak rationale for proposed research. (Mark range 16-20)	Little relevant literature reviewed, very limited evidence of understanding and weak rationale for proposed research. (Mark range = ≤16).
Research design, methods, analysis, ethics and time management (40% weight)	Excellent application of research design principles in terms of appropriate: methodology; methods for generating and analysing data; consideration of any ethical issues and time management plan. (Mark range 32-40)	Very good application of research design principles in terms of appropriate: methodology; methods for generating and analysing data; consideration of any ethical issues and time management plan. (Mark range 28-32)	Good application of research design principles in terms of appropriate: methodology; methods for generating and analysing data; consideration of any ethical issues and time management plan. (Mark range 24-28)	Adequate application of research design principles in terms of appropriate: methodology; methods for generating and analysing data; consideration of any ethical issues and time management plan. (Mark range 20-24)	Weak application of research design principles and limited evidence of understanding of: appropriate methodology; methods for generating and analysing data; ethical issues and time management. (Mark range 16-20)	Poor application of research design principles and very limited evidence of understanding of: appropriate methodology; methods for generating and analysing data; ethical issues and time management. (Mark range = ≤16).
Identified impact/outcomes, structure, proposal abstract, and referencing. Oral presentation. (20% weight)	Excellent consideration of potential research impact/outcomes. Excellent abstract and structure. All referencing consistent and appropriate. (Mark range 16-20)	Very good consideration of potential research impact/outcomes. Very good abstract and structure. All most all referencing consistent and appropriate. (Mark range 14-15)	Good consideration of potential research impact/outcomes. Good abstract and structure. Most referencing consistent and appropriate. (Mark range 12-13)	Adequate consideration of potential research impact/outcomes. Adequate abstract and structure. Adequate consistent and appropriate referencing. (Mark range 10-11)	Limited/weak consideration of potential research impact/outcomes. Weak abstract and structure. Frequent inconsistent and/or inappropriate referencing. (Mark = 8-9)	Very limited and poor consideration of potential research impact/outcomes. Poor abstract and structure. Very frequent inconsistent and/or inappropriate referencing. (Mark range = ≤7).
	80-100	70-79	60-69	50-59	40-49	<40

THE FINAL MARK MUST BE 40% OR ABOVE TO ACHIEVE A PASS