University of Dublin
Trinity College

School of Computer Science and Statistics

Management Science
and
Information Systems Studies

Information Booklet for Senior Freshman Students

2014/2015
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PART I - Information

1. Welcome

Welcome back. I hope you had a good break. Congratulations on getting through JF.

If you have any queries during the year you are welcome to drop into my office in Room 1.32 in the Lloyd Institute or email me at aideen.keaney@tcd.ie.

I wish you every success in the coming year.

Aideen Keaney
Course Director, MSISS.

2. A Note on this Handbook

This handbook contains information and regulations for Senior Freshman students on the BA (Mod) Management Science and Information Systems Studies in the 2014-15 academic year. Please retain it for future reference.

Information provided in this handbook is accurate at time of preparation. Any necessary revisions will be notified by college email. Please note that, in the event of any conflict or inconsistency between the General Regulations published in the University Calendar and information contained in course handbooks, the provisions of the General Regulations will prevail. The University Calendar is available at

http://www.tcd.ie/calendar/

This handbook is also available from the School of Computer Science and Statistics website at

https://www.scss.tcd.ie/undergraduate/msiss/sf/

It is strongly recommended that you keep this booklet safely. You may need to refer to it during the year.
3. General Information

3.1. Term Dates

The following table lists the duration of each term and the start and end dates for teaching in each term for the 2014-15 academic year. No lectures are held during the reading weeks in each term.

<table>
<thead>
<tr>
<th>Term</th>
<th>Duration</th>
<th>Start and End Dates (2014-15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michaelmas Term (MT)</td>
<td>12 weeks</td>
<td>22nd September 2014 – 12th December 2014  (Reading Week: 3rd November – 7th November 2014)</td>
</tr>
<tr>
<td>Hilary Term (HT)</td>
<td>12 weeks</td>
<td>12th January 2015 – 3rd April 2015                                  (Reading Week: 23rd February – 27th February 2015)</td>
</tr>
</tbody>
</table>

Annual examinations will take place from 27th April to 22nd May 2015. Examination dates will be posted on the College web site in due course. It is the student’s responsibility to determine dates, times and locations of examinations.

3.2. Contact Information

**BA (Mod) Management Science and Information Systems Studies Administration**

Course Director  
Dr Aideen Keaney  aideen.keaney@tcd.ie

Course Administrator  
Gillian Long  Gillian.Long@scss.tcd.ie
3.2.1. The MSISS Library

MSISS has its own library. Undergraduates have full access and some borrowing rights from the library and students are encouraged to make use of it. This library holds MSISS core texts and Final Year project reports, is in Statistics Reception, Room 1.04. The core texts are those recommended for certain MSISS modules.

Undergraduates may borrow these books and project reports under the following conditions:

- They must be checked out by Gillian Long, who will make a note of your student ID number.
- A maximum of three core texts can be borrowed at any time.
- Once checked out, you have the right to the book for one week. After that time, you may be asked to return the book if it is requested by another student. This request will come by e-mail. Otherwise there is no borrowing time limit during term time (see below).

All projects and books must be returned before the end of Trinity Term. Please do not remove books from libraries - even for temporary periods.

3.3. Dealing with Problems

If you have problems, it saves you and us a great deal of hassle if they are directed to the right source. In general enquiries should be directed as follows:

3.3.1. Personal Problems

Most matters including all personal problems and/or requests for special treatment (e.g. seeking permission to take a year off, obtaining details of your examination marks or appealing an examination result) should be taken to your tutor, whose job it is to help you. Going to other staff members or the course administrator will only result in your being re-directed. If your tutor cannot be found, you should approach one of the other tutors or in an emergency, the Senior Tutor.

3.3.2. Administrative Matters

Administrative matters (e.g. replacement of lost timetables or requests for transcripts) should be addressed to Gillian Long Gillian.Long@scss.tcd.ie or to teaching-unit@scss.tcd.ie.
3.3.3. Academic Matters

Academic issues (e.g. “I don’t understand this”, “Can we arrange a revision class?”) should be taken to the lecturer concerned. Lecturers are here to help you. If you are in difficulties you should ask for help. Be aware however that lecturers are generally only willing to help students who attend lectures regularly (unless the students concerned are absent for some genuine reason). Many academic staff, including the Director of Studies, have ‘office hours’, i.e. times when they are available in their rooms to meet students without a prior appointment. These are usually posted on their office door. It is helpful to staff if a problem can wait until one of these times.

Programme or wider course issues (e.g., books are not available in the library, you can’t hear a certain lecturer because he/she does not speak clearly) should be taken to the class representative who should in turn take them up with the Director of Studies, Aideen Keaney. If in doubt, speak to your tutor first.

3.3.4. Programming Centre

The Programming Centre is available to all MSISS students free of charge. The centre operates as a drop-in service where you can get help with any problems you might have with programming in your courses. For further information, please visit http://www.scss.tcd.ie/misc/psc/

3.3.5. Study Skills

Skills4studycampus (S4SC) is an interactive e-learning resource, designed to enable students to develop study skills and is suitable for students on all courses and in any year of study. The system was tested in a pilot project in Trinity last year, and is now available via the skills4studycampus link on the college’s local home page, http://www.tcd.ie/local

3.3.6. Students with Disabilities

If you have a general or a specific learning disability (such as dyslexia) you may want to register with Student Disability Services. A variety of supports are available to disabled students within the College. Further information on these services can be found at http://www.tcd.ie/disability/

You can make an appointment to see staff of Student Disability Services:

- By Phone: (01) 896 3111
- By Text (Deaf Students): 086 3442322
- By Email: disab@tcd.ie
- On the website
- Or, by calling into the office (Room 2054, The Arts Building).
3.3.7. Other Sources of Support and Help in College

- Student Counselling Service – 3rd Floor 7-9 South Leinster St., Tel: 01 896 1407, or email: student-counselling@tcd.ie. Emergency appointments are available. This service is confidential and free to students. See http://www.tcd.ie/Student_Counselling/

- Chaplains - House 27, chaplaincy@tcd.ie. Tel: Peter Sexton and Paddy Gleeson : 01 896 1260; Julian Hamilton : 01 896 1901 and Darren Mc Callig at 01 896 1402. The Chaplains run a Bereavement Support Group for those who have experienced loss. The Chaplains will also help you make contact with other religious communities in Dublin. See http://www.tcd.ie/Chaplaincy/index.htm

- College Health Service - House 47 (beside the rugby pitch), Tel: 01 896 1556. Appointments may be made in person or by telephone. This service is free to most students. http://www.tcd.ie/College_Health

- College Tutors and Senior Tutor's Office, House 27. Tel: 01 896 2551. stosec@tcd.ie. You can find your tutor's name and contact number through the my.tcd.ie portal.

- Welfare Officer, Students’ Union, House 6, College 01 646 8437, welfare@tcdu.org;

- Niteline - A confidential help-line for students run by students is available during term-time, by telephone between 9pm and 2.30am from Thursday to Sunday at 1800 793 793 and on Mondays from 9pm to 1.30am.

REMEMBER

If you are in difficulties of any sort, seek help as soon as possible. The staff and College support services are here to help you.
PART II - Regulations

4. Overview of Regulations

This part of the Course Handbook sets out the examination regulations that apply to the BA (Mod) Management Science and Information Systems Studies in the 2014-15 academic year.

The College Calendar, which is published annually at the beginning of each academic year, contains the following additional regulations:

- **General Regulations** that apply to all degree programmes in the University;
- **General Faculty Regulations** that apply to courses within the Faculty of Engineering, Mathematics and Science;
- Regulations that apply specifically to the Moderatorship in Management Science and Information Systems Studies.

If any discrepancy exists between the regulations in this document and the College Calendar, the College Calendar takes precedence.

The Calendar is available online at [http://www.tcd.ie/calendar/part1/](http://www.tcd.ie/calendar/part1/)

You are expected to be aware of the various regulations. Ignorance of the regulations is not a valid reason for failure to comply.

4.1. Rules for Handing in in-term Assessments

Many MSISS modules include an element of continuous assessment. Different departments have their own rules on assessments and homework. You should make sure that you are familiar with these rules and that you understand them. The MSISS rules for handing in and marking of assessments are summarised below.

1. Unless otherwise stated, the deadline for all MSISS continual assessment work will be 12.00 noon on a Monday. The Lecturer-in-Charge must give written or e-mail notice of alternative deadlines. Where non standard procedures apply, (s)he must also give written or e-mail notice of:
   - the deadline;
   - where and how assessments are to be handed in;
   - the penalties for late submission;
   - the procedures for granting permission for late submissions.

   Otherwise the default rules as set out below will apply.

2. The default procedure for assignment submission is as follows.
All module work must be handed in to the School office. When handing in an assignment or project, you must sign the “Student Assessment Sign-in” sheet in the presence of the course administrator. The date and time the assessment is handed in is noted on this sheet. Assessments must be clearly labelled and show:

- Your name;
- The correct description of the assignment (e.g. Applied Prob. Exercise 3);
- The name of the appropriate lecturer.

At the end of the week, the tray will be cleared and all assignments and the sign-in sheet will be handed to the lecturer.

If the office is closed you should put your assignment in the box provided and sign the sign-in sheet. Clearly write your name, the name of the assignment, the name of the lecturer, and the time you signed in.

3. **Penalties** for late submission are as follows. Material submitted late will be down marked 20% of the mark that would otherwise have been awarded for each day (or part thereof) that it is late. Thus work that is late at all will incur a penalty of 20%, work submitted more than 24 hours late will incur a penalty of 40% and so on. Work submitted more than 96 hours late will receive a mark of zero. For MSISS this means that work submitted after 12.00 noon on the Friday of the relevant week will receive a mark of zero.

4. **Extensions** are normally granted only if you can present a good reason for not being able to submit on time. If you need an extension you should speak to your tutor not to the Lecturer. Lecturers will normally grant you an extension following a letter from your tutor who must ask for a specified number of days extension. Tutors will only recommend extensions if the difficulties could not have been foreseen.

Sometimes, where there is a general problem, a Lecturer may award an extension to the entire class. In this case, the details of the extension will be posted or e-mailed to all students. The penalty will operate as before, after the extension. If the assessment in question is a team project, and the extension is sought - through the tutor - by one team member, the maximum extension that can be given is 1 week.

5. **You should always retain a copy of everything submitted in case of dispute; a paper copy is recommended.** If kept in electronic form, you should have a backup copy. This is important. If, for example, a Lecturer says he/she never received your submission and you do not have a copy, it may be difficult to prove that you ever submitted it!

6. If you have really exceptional problems (for example, your tutor is ill), you should speak to the Director of Studies.
4.2. **Teamwork Assessment**

During your time in MSISS you will be required to work in teams and prepare assessments which will be graded and contribute to your final examination results. Your attention is drawn to the following regulation, instituted in an effort to be equitable to all team members:

“In the case of project work conducted by teams, the work of each team will be assessed as a team. Individual students’ assessment grades will be based primarily on the team assessment grade. In addition, students may be asked to submit an individual report on perceived contributions, per cent, of all team members. Adjustments to individual grades may be made in the light of these reports. In the event of discrepancy, the lecturer may consult some or all group members.”

4.3. **Plagiarism**

Students should be aware of the University’s policy regarding plagiarism. Plagiarism is interpreted by the University as the act of presenting the work of others as one's own work, without acknowledgement. Plagiarism is considered as academically fraudulent, and an offence against University discipline. The University considers plagiarism to be a major offence, and subject to the disciplinary procedures of the University. Plagiarism can arise from deliberate actions and also through careless thinking and/or methodology. The offence lies not in the attitude or intention of the perpetrator, but in the action and its consequences. Plagiarism can arise from actions such as:

(a) copying another student's work;

(b) enlisting another person or persons to complete an assignment on the student's behalf;

(c) quoting directly, without acknowledgement, from books, articles or other sources, either in printed, recorded or electronic format;

(d) paraphrasing, without acknowledgement, the writings of other authors.

Examples (c) and (d) in particular can arise through careless thinking and/or methodology where students:

(i) fail to distinguish between their own ideas and those of others;

(ii) fail to take proper notes during preliminary research and therefore lose track of the sources from which the notes were drawn;

(iii) fail to distinguish between information which needs no acknowledgement because it is firmly in the public domain, and information which might be widely known, but which nevertheless requires some sort of acknowledgement;

(iv) come across a distinctive methodology or idea and fail to record its source.
All the above serve only as examples and are not exhaustive. Students should submit work done in co-operation with other students only when it is done with the full knowledge and permission of the lecturer concerned. Without this, work submitted which is the product of collusion with other students may be considered to be plagiarism.

It is clearly understood that all members of the academic community use and build on the work of others. It is commonly accepted also, however, that we build on the work of others in an open and explicit manner, and with due acknowledgement. Many cases of plagiarism that arise could be avoided by following some simple guidelines:

(i) Any material used in a piece of work, of any form, that is not the original thought of the author should be fully referenced in the work and attributed to its source. The material should either be quoted directly or paraphrased. Either way, an explicit citation of the work referred to should be provided, in the text, in a footnote, or both. Not to do so is to commit plagiarism.

(ii) When taking notes from any source it is very important to record the precise words or ideas that are being used and their precise sources.

(iii) While the Internet often offers a wider range of possibilities for researching particular themes, it also requires particular attention to be paid to the distinction between one's own work and the work of others. College regulations on Plagiarism can be found in the College Calendar, Section H70-78: General Regulations and Information or online at:

   http://www.tcd.ie/calendar/assets/pdf/general_information.pdf

We reserve the right to use plagiarism detection technology to investigate suspicions of plagiarism.
4.4. Examination Regulations - Senior Freshman

To rise from one year to the next year of the programme, Senior Freshman students must satisfy their examiners subject to the regulations set out in this section.

1. The examinable subjects are as follows:

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST2004</td>
<td>Applied Probability I</td>
<td>5</td>
</tr>
<tr>
<td>ST2005</td>
<td>Applied Probability II</td>
<td>5</td>
</tr>
<tr>
<td>ST2006</td>
<td>Management Science Methods</td>
<td>10</td>
</tr>
<tr>
<td>MA2E01</td>
<td>Engineering Mathematics III</td>
<td>5</td>
</tr>
<tr>
<td>MA2E02</td>
<td>Engineering Mathematics IV</td>
<td>5</td>
</tr>
<tr>
<td>BU2530</td>
<td>Introduction to Accounting</td>
<td>5</td>
</tr>
<tr>
<td>BU2550</td>
<td>Introduction to Finance</td>
<td>5</td>
</tr>
<tr>
<td>CS2010</td>
<td>Programming Techniques</td>
<td>10</td>
</tr>
<tr>
<td>ST2002</td>
<td>Introduction to Regression</td>
<td>5</td>
</tr>
<tr>
<td>ST2001</td>
<td>Software Applications II</td>
<td>5</td>
</tr>
</tbody>
</table>

These are examined during the annual examination period.

The mark in each subject is generally a combination of an exam mark and a coursework mark, but some courses, for example ST2001 are assessed by coursework only. The method which is used to combine exam and assignment marks into the overall mark is at the discretion of the course lecturer. In some courses to pass students must pass BOTH the written examination AND the coursework component. Students should make themselves aware of the rules governing assignments at the beginning of each course.

2. The overall average mark in the annual examination will be a weighted average of each modules mark. The weights used will be the ECTS value for each subject.

3. To pass candidates must achieve a mark of 40% or more in each of the subjects.
4. Candidates may also pass by compensation if and only if:
   
   - They achieve an overall average mark of 40% or more and either;
     
     o pass modules totalling 55 credits, and get a minimum mark of 30% in the failed module
     or
     
     o pass modules totalling 50 credits, and get a minimum mark of 35% in the failed module(s) (either one 10-credit module or two 5-credit modules).

5. A grade based on the overall average mark will be returned for students who pass as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>70%-100%</td>
</tr>
<tr>
<td>II.1</td>
<td>60%-69%</td>
</tr>
<tr>
<td>II.2</td>
<td>50%-59%</td>
</tr>
<tr>
<td>III</td>
<td>40%-49%</td>
</tr>
</tbody>
</table>

Where appropriate, transcripts will show “by compensation”.

6. Students who do not pass the year at the annual examination session will be required to sit supplemental examinations or complete supplemental coursework in those modules failed in the Annual Examination Session.

7. To pass the supplemental examination candidates must achieve a minimum of 40% in the each of the subjects examined. Candidates may also pass by compensation if and only if:

   - They achieve an overall average mark of 40% or more and either;
     
     o pass modules totalling 55 credits, and get a minimum mark of 30% in the failed module
     or
     
     o pass modules totalling 50 credits, and get a minimum mark of 35% in the failed module(s) (either one 10-credit module or two 5-credit modules).

A student's overall mark will be calculated as the average of each module's mark weighted by its ECTS rating. Where a module has been examined more than once, the mark achieved in the most recent examination will be used. The overall end of year result for a student who is eligible to progress on the basis of marks attained at a supplemental examination will be recorded as “Pass at Supplemental”.

8. A student who does not pass by either of the methods above is required to repeat the year in full. This includes completing all assessment elements of all modules (e.g. all continuous assessment requirements).

9. Failure to present at College examinations without good reason will result in a student being excluded from the course.

Students who do not make a serious attempt at their examinations may be excluded from the course.
Part III – Programme Structure

5. An Overview of the Senior Freshman Year

This section lists the Senior Freshman subject modules and a brief description of each is given. Detailed module descriptors are available to view on the student portal, my.tcd.ie. Note: the brief module descriptions may be subject to change. Please refer to my.tcd.ie for the most up to date versions.

<table>
<thead>
<tr>
<th>Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Probability I</td>
</tr>
<tr>
<td>Applied Probability II</td>
</tr>
<tr>
<td>Management Science Methods</td>
</tr>
<tr>
<td>Engineering Mathematics III</td>
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</tr>
<tr>
<td>Software Applications II</td>
</tr>
</tbody>
</table>

5.1. ST2004 Applied Probability I

Uncertainty and/or variation that is random or unpredictable is a central challenge in devising efficient systems. Examples include a Google search, student progression given imprecise marking, a pension scheme, the evaluation of financial derivatives, and more generally planning in an uncertain environment given imprecise or inadequate data. This course aspires to build confidence in the manipulation of uncertain information. Additionally randomness is deliberately introduced in security systems, and exploited in computer graphics. The central tool is the use probability to model or approximate a system.

In this course we take a novel approach that replaces mathematics with the use of ‘random numbers’ in a spread sheet – or more generally an algorithm; this is known as the Monte Carlo method (http://en.wikipedia.org/wiki/Monte_Carlo_method). Students will rapidly acquire the facility to model quite complex random (or stochastic) systems. They will subsequently learn the language of probability which can sometimes by-pass the algorithms, or render them more efficient.
5.2. **ST2005 Applied Probability II**

This module develops several important ideas in statistical analysis making use of some of the ideas introduced in ST2004. It acts as a bridge to the sophister years by introducing the fundamental ideas that are used in the more advanced statistics modules that will take place then.

The module will cover the derivation of the confidence interval and tests of hypothesis for normal data; the difference between a confidence interval and a prediction interval; the Central Limit Theorem and what it says about confidence intervals and tests of hypothesis; the bootstrap approach to confidence intervals and tests of hypothesis; introduction to maximum likelihood estimation and computation through Excel; the q-q plot and transforming data to make it more Gaussian; introduction to multivariate distributions; and statistical reasoning: bias in statistical studies (selection bias, Rubin's propensity).

5.3. **ST2006 Management Science Methods**

This course is based on developing and solving mathematical models of real life problems. In the first semester, students receive a theoretical introduction to the fundamental elements of a mathematical model. Modelling techniques are taught to solve problems in many domains. In the second semester students are introduced to the concepts, ideas and techniques involved in simulation.

5.4. **MA2E01/MA2E02 Engineering Mathematics III and IV**

These modules are a natural continuation of the Junior Freshman Modules MA1E01 Engineering Mathematics I and MA1E02 Engineering Mathematics II.

Engineering Mathematics III introduces students to further fundamental ideas and methods of mathematics for engineering, covering the areas of multivariate calculus, integration and Laplace transforms. The aim of the module is to provide the necessary background and to teach the students to use it efficiently.

Engineering Mathematics IV introduces and illustrates the fundamental ideas and methods of linear algebra and fourier analysis. The module also introduces the concept of n-dimensional vectors and shows their role and importance in practice; shows the interrelations between linear systems, linear transformations and their matrices. The module aims to promote mathematical confidence and sensibility and to enable students to apply their knowledge to new situations.
5.5.  **BU2530 Introduction to Accounting**

This module deals with the construction and interpretation of five key financial statements – the balance sheet, the income statement, the statement of comprehensive income, the statement of changes in equity and the cash flow statement. Underlying concepts relating to matching, income measurement and asset valuation are explored in detail and the principles of sound financial management are developed as the module progresses.

The overall goal of the module is that students obtain a sound understanding of 'money in organisations' and – more specifically – learn how to judge (a) whether organisations are performing well and are financially healthy or (b) whether there are weaknesses in their financial performance/financial structure.

5.6.  **BU2550 Introduction to Finance**

This module introduces fundamental concepts and techniques of modern finance. It starts with reviewing the nature and role of financial markets, institutions and securities. The module proceeds with the presentation of the key tools used by financial managers and investors in analysis and decision making. The theoretical models and assumptions underlying the development of modern financial techniques will also be examined. On completion of the module students should be able to understand the principles underlying the working of most financial markets, to carefully evaluate investment opportunities and understand associated risks.

5.7.  **CS2010 Programming Techniques**

The aim of the module is threefold:

1. To teach effective programming and problem solving, using a core toolset of classical algorithms and data structures.
2. To introduce the methods for evaluating the performance and requirements of programs written by the students.
3. To promote effective software engineering by using well-established techniques for code modularity, structuring, debugging and readability, such as Design by Contract, and unit testing.

5.8.  **ST2002 Introduction to Regression**

Regression is probably the most widely used tool in statistics. When students have successfully completed this module they should: understand the concepts involved in simple and multiple linear regression analysis; understand how to use MINITAB software for regression; understand the pitfalls in analysis and understand its limitations.
5.9.  ST2001 Software Applications II

The purpose of this course is to give students experience in advanced computer applications. This will include the advanced applications of Excel. The course will introduce students to database technology using Microsoft Access. Students will use Visual Basic for Applications (MS Office 2010).