

THE UNIVERSITY OF MANCHESTER
Postgraduate Programme Specification

Note: To add a new row to any table sit in the last column of the last row and press the Tab key.



1. GENERAL INFORMATION

Award	Programme Title	Duration	Mode of study
MSc	Computational Science & Engineering	1 year	Full-time
MSc	Computational Science & Engineering	2 -4years	Part-time
MSc	Computational Science & Engineering	3-4 years	Modular
PG Diploma	Computational Science & Engineering	1 year	Full-time (exit award only)
PG Diploma	Computational Science & Engineering	2-3 years	Part-time (exit award only)
PG Diploma	Computational Science & Engineering	2-3 years	Modular
PG Certificate	Computational Science & Engineering	1 year	Full-time (exit award only)
PG Certificate	Computational Science & Engineering	2 years	Part-time (exit award only)
PG Certificate	Computational Science & Engineering	2 years	Modular (exit award only)

School	Computer Science
Faculty	Engineering & Physical Sciences
Awarding Institution	The University of Manchester
Programme Accreditation	None
Relevant QAA benchmark(s)	N/a – currently only at undergraduate level

2. AIMS OF THE PROGRAMME(S) (must include separate aims for PG Certificate and PG Diploma awards)

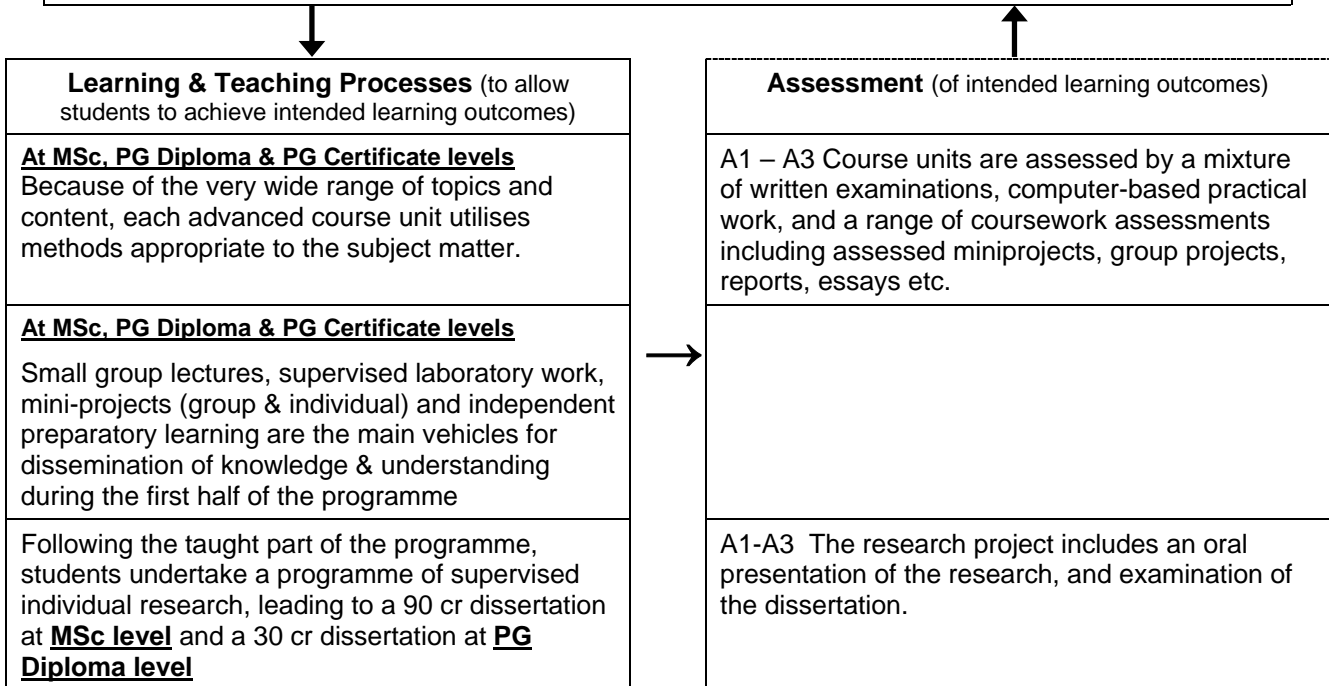
The programme aims to: (**NB PG Cert is exit award only**):

01.	<u>At PG Diploma level:</u> Teach general principles of Computational Science to students who have a strong academic track record in a mathematically-based science or engineering discipline, but who have little formal training in Computer Science
02.	Provide sufficient breadth and depth of experience in up-to-date methodologies that students will have significantly advanced their career prospects within specialised sectors of the IT industry
03.	Equip students with sufficient knowledge of Computational Science that they will be able to extend the use of computer technology in their original discipline
04.	Continue to attract the highest-quality students from the UK and overseas
05.	Provide an opportunity to engage in a small research project in Computational Science & Engineering
06.	<u>At MSc level:</u> As above except that in place of 05: Offer the opportunity to engage in a substantial research project in Computational Science & Engineering.
07.	<u>At MSc level:</u> Provide high quality training and experience in research in Computational Science & Engineering

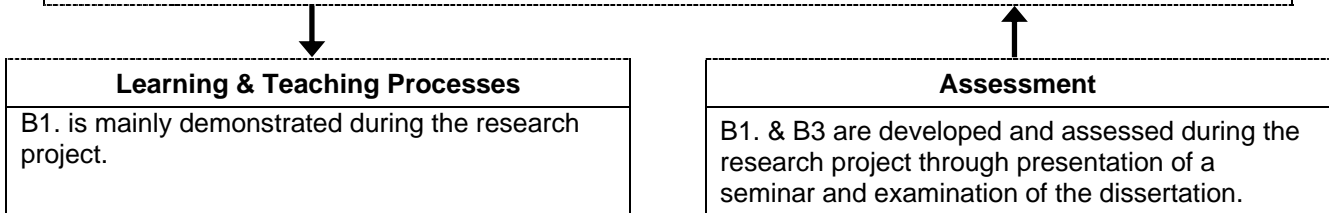
THE UNIVERSITY OF MANCHESTER
Postgraduate Programme Specification

3. INTENDED LEARNING OUTCOMES OF THE PROGRAMME(S) (must include separate outcomes for PG Certificate and PG Diploma awards)

A. Knowledge & Understanding	
Students will be able to:	
A1.	<u>(at all levels)</u> Acquire a knowledge & understanding of a range of topics in Computational Science, including numerical algorithms, hardware & software architectures, software engineering principles & methodologies, operating systems & software tools beyond undergraduate level and at the forefront of research
A2.	<u>(at all levels)</u> Acquire a knowledge & understanding of selected advanced topics to provide a deeper understanding of some aspects of the subject, such as visualisation, parallel computing, simulation techniques and languages, and artificial intelligence.
A3.	<u>At MSc & PG Dip levels</u> Have a knowledge & understanding of research methodology & practice

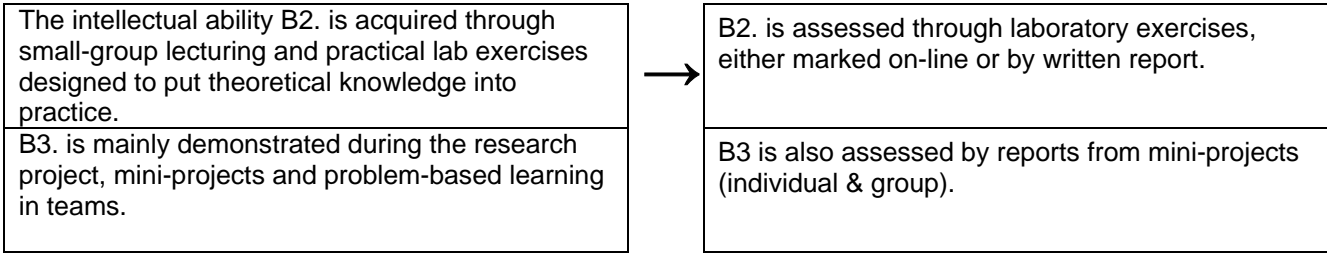


B. Intellectual Skills	
Students will <i>(please delete as appropriate)</i> be able to:	
B1.	Develop original ideas in a research context <u>(MSc and PG Diploma levels only)</u>
B2.	Use methodologies for development of computational systems at an advanced level <u>(All)</u>
B3.	Perform problem-solving in academic and industrial environments <u>(All)</u>

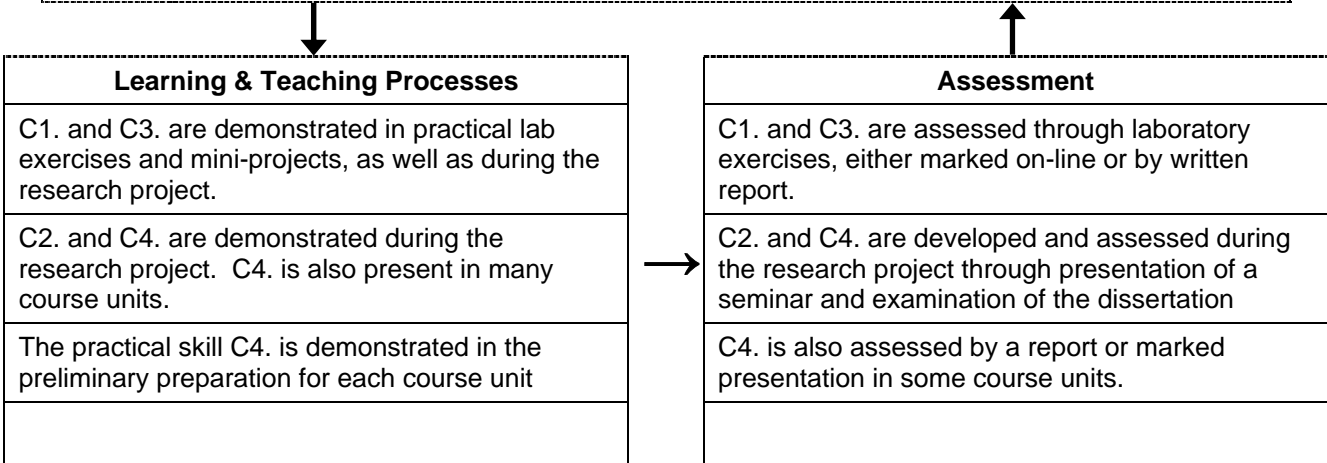


THE UNIVERSITY OF MANCHESTER

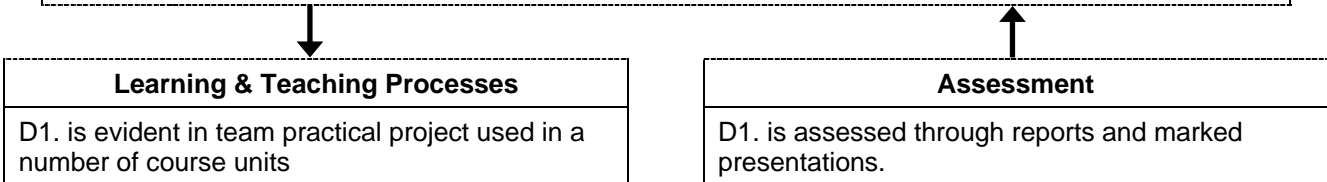
Postgraduate Programme Specification



C. Practical Skills	
Students will <u>at MSc, PG Diploma & PG Certificate levels</u> be able to:	
C1.	Develop applications to satisfy given requirements
C2.	Organise & pursue a scientific or industrial research project (MSc and PG Diploma only)
C3.	Use, manipulate and develop large computational systems
C4.	Perform independent information acquisition and management



D. Transferable Skills and Personal Qualities	
Students will <i>(please delete as appropriate)</i> be able to:	
D1.	Work effectively as a team member (MSc, PG Diploma & PG Certificate)
D2.	Prepare and present seminars to a professional standard (MSc level only)
D3.	Write theses and reports to a professional standard (MSc and PG Diploma)
D4.	Perform independent and efficient time-management (MSc, PG Diploma & PG Certificate)



THE UNIVERSITY OF MANCHESTER
Postgraduate Programme Specification

D2. is demonstrated during the research project seminar and also within a number of course units.	→	D2. is assessed during the research project seminar, where feedback is provided on presentation skills.
D3. is demonstrated through lab practical and mini-project reports and the research project dissertation.		D3. is assessed by the research project dissertation.
D4. is demonstrated by the ability to meet a number of deadlines throughout the year, and to effectively carry out a research project on time		D4. is assessed by course unit teachers & the exams office, who must ensure coursework and dissertations are submitted on time. The research project internal examiners assess progress of the project at the project seminar.

4. THE STRUCTURE OF THE PROGRAMME(S)

Programme structure and credits	Credits
<p>Please indicate both compulsory units and optional units (including Choice of _ from _) , as well as requirements for exit awards and any specified pathways.</p> <p>For more details about all course units available, please see web-page at: http://www.cs.man.ac.uk/Study_subweb/Postgrad/</p> <p><u>September</u> Introductory fortnight. Introductory talks for each course unit offered.</p> <p><u>September – January</u> Students usually take 60 credits-worth of course units in the 1st semester, e.g. four of the course units identified in the table at 6. below, including the core course units: COMP60071 (Introduction to Computational Science) & COMP60081 (Fundamentals of High Performance Execution)</p> <p><u>January – April</u> Students usually take 30 credits-worth of course units in the first part of the 2nd semester e.g. two of the course units identified in the table below, including the core course unit COMP60092 (Algorithms for Differential Equations). To continue towards the research project for MSc award, students need to pass the taught component. Exit at this stage with PG Certificate or transfer to PG Diploma is determined by assessment regulations. MSc and Diploma students select their research project.</p> <p><u>April – September</u> Research Project.</p>	<p>0</p> <p>60</p> <p>30</p> <p>(PG Cert exit with 60 credits)</p> <p>90 (MSc) 30 (PG Dip exit with 90+30 credits)</p>

5. STUDENT INDUCTION, SUPPORT AND DEVELOPMENT (in order to deliver the intended learning outcomes, including dissertation support and guidance)

THE UNIVERSITY OF MANCHESTER

Postgraduate Programme Specification

Induction

Students introduced to a broad range of advanced topics in Computer Science. Opportunity to make informed choice of course units.

September – January

Course units are taught in an intensive mode: 1 day a week for 5 weeks are 'taught' days consisting of lectures, supervised practicals etc., 2.5 days a week for 5 weeks are practical exercises and 2.5 days of a coursework completion week are also practical exercises. Some of the practical exercises may be assessed work. Most course units are assessed through coursework (66%) and end-of-semester examination (34%). However, flexibility is allowed in the delivery and assessment, allowing methods appropriate for each subject. Further information is available at:

http://www.cs.man.ac.uk/Study_subweb/Postgrad/

January – April

To continue towards the research project for MSc award, students need to pass the taught component. For PG Certificate exit award, students need to pass 60 credits of taught course units. For PG Diploma, students need to pass the taught component to progress to the research project. MSc and Diploma students select their research project from a wide range of proposed projects, and also by individual agreement with supervisors.

April – September

There is a presentation to supervisor, internal examiner & fellow students, 2-3 months after the start of the project. Feedback on presentation skills and a progress report are provided for the student at this point. The dissertation is assessed by two internal examiners by report and moderated by one external examiner.

Students have access to the Programme Director throughout the programme. They are encouraged to contact the Director when problems arise and are informed of this during the introductory period. The School also has a drop-in Advice Centre for lunch-time help-sessions. During the period of the research project, an individual assigned supervisor is also available. Relationship with the supervisor is outlined in the Programme Handbook and the Research Skills course unit COMP60992.

THE UNIVERSITY OF MANCHESTER Postgraduate Programme Specification

To add further columns, sit in A5, B5, C5, or D5. Select **Insert** from the **Table** menu, select **Columns to the Right**. To add more rows, before you've filled in the final row of the year, sit in the final row, select **Insert** from the **Table** menu, select **Rows above**. To delete a column, sit in the column you want to delete, select **Delete** from the **Tables** menu and select **Columns**. To delete a row sit in the row you want to delete, select **Delete** from the **Tables** menu and select **Rows**.

6. CURRICULUM MAP OF COURSE UNITS AGAINST INTENDED LEARNING OUTCOMES OF THE PROGRAMME

Course Unit Title and Code <small>(including dissertations and other programme components)</small>	Knowledge & Understanding (A)	Intellectual Skills (B)	Practical Skills (C)	Transferable Skills & Personal Qualities (D)
---	-------------------------------	-------------------------	----------------------	--

Code	Course Unit title	C/O	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	D4
COMP 60001	Introduction	C	D	D												
COMP 60022	Grid Computing & e-Science	O		A D			A D	A D	A D		A D		A D			D
COMP 60032	High Performance Computing in Science & Engineering	O		A D			A D	A D	A D		A D	A D	A D		A D	D
COMP 60051	Visualization for HPD	O		A D			A D	A D	A D		A D		A D			D
COMP 60071	Introduction to Computational Science	C	A D				A D	A D	A D		A D	A D	A D	A D	A D	D
COMP 60081	Fundamentals of High Performance Execution	C	A D				A D	A D	A D		A D	A D	A D	A D	A D	D
COMP 60092	Algorithms for Differential Equations	C	A D	A D			A D	A D	A D		A D		A D		A D	D
COMP 60431	Machine Learning	O		A D			A D	A D	A D						A D	D
COMP 60440	Advanced Machine Vision	O		A D			A D	A D	A D					A D		D
COMP 60491	Robotics	O		A D			A D	A D	A D				A D			D
COMP 60992	Research & Professional Skills	C			D	D		D		D			D		D	
COMP 60900	Research Project	C	A D	A D	A D	A D	A D	A D	A D	A D		A D		A D	A D	A D

Legend for cells

D = intended learning outcomes of the programme are taught or developed by students within this course unit
A = intended learning outcomes of the programme are assessed within this course unit

C = compulsory course unit
O = optional course unit

THE UNIVERSITY OF MANCHESTER

Postgraduate Programme Specification

7. CRITERIA FOR ADMISSION

Candidates must be able to satisfy the general admissions criteria of the University and of the School in at least one of the following ways:

Entry to the programme is by a 1st class or good 2nd class honours degree or its overseas equivalent in a mathematically-based Science or Engineering subject. In exceptional circumstances, candidates without an honours degree but with considerable and relevant industrial and educational experience will be accepted.

Those applicants for whom English is not their first language must satisfy the language requirement of IELTS 7+ (or TOEFL 600, Cambridge Proficiency Grade C)

Further details are available at:

http://www.cs.man.ac.uk/Study_subweb/Postgrad/ACS-CS/webpages/handbook/acs/acs.html/

8. PROGRESSION AND ASSESSMENT REGULATIONS

The assessment for the **MSc** consists of two parts: (1) an assessment of the **taught course units** undertaken and (2) an assessment of the **project dissertation**. In order to be allowed to progress to the research project, students must successfully pass the taught part of the programme. The award of an MSc is then dependent upon passing the assessment of the project dissertation.

(1) Each student will be assessed on 90 credits' worth of coursework and examination questions. Coursework is likely to include practical laboratory exercises (individually or in groups), written essays, seminar presentations, and/or other forms appropriate to each individual course unit; for each full course unit, this usually carries two-thirds of the mark. The examinations usually consist of a two-hour paper for each course unit, carrying one third of the marks, and take place after the teaching in each semester. The University regulations are at: <http://www.campus.manchester.ac.uk/medialibrary/policies/ordinance-master-pg-diploma-pg-certificate.pdf>

A candidate is required to register for 90 credits' worth of course units, and will normally be considered as passing the units if:

(i) the credit-weighted average is 50% or more on the course units, and

(ii) the credit-weighted average of the practical work is 40% or more, and the credit-weighted average of the examination results is 40% or more, and

(iii) course units whose results are below 50% amount to **no more than 45 credits**.

These can be re-sat once and the maximum mark to be awarded will normally be 50%.

Compensated passes:

(i) Students may be awarded a compensated pass for a **Masters degree** when they fail **no more than 30 credits** and receive a mark between 40 and 49% for those failed credits. The student must also have gained an overall average for all taught credits of 50% or more in order to be granted a compensated pass.

(ii) Students may be awarded a compensated pass for a **Postgraduate Diploma** programme when they fail **no more than 30 credits** and receive a mark between 30 and 39% for those failed credits. The student must also have gained an overall average for all taught credits of 40% or more in order to be granted the compensated pass.

(iii) Students may be awarded a compensated pass for a **Postgraduate Certificate** programme when they fail **no more than 15 credits** and receive a mark between 30 and 39% for those failed credits. The student must also have gained an overall average for all taught credits of 40% or more in order to be

THE UNIVERSITY OF MANCHESTER

Postgraduate Programme Specification

granted the compensated pass.

Failed units:

The maximum allowable cumulative failure of course units in a Masters programme at the first attempt is 45 credits of the taught component of the programme. A student whose failures at the first attempt exceed 45 credits will be deemed to have failed the programme. They will then be judged against the requirements for a pass on the Postgraduate Diploma programme. If this results in their failing less than or equal to 45 credits at Postgraduate Diploma level, the student may resit those units failed at Postgraduate Diploma level to obtain the award of Postgraduate Diploma.

The final decision on whether a student passes is taken by the MSc Examination Board.

(2) The assessment of the **dissertation** is by two internal examiners, moderated by one external examiner. Details about dissertation format etc can be found on the University website and should be submitted in accordance with the information set out in the University's Guidance Notes for the Presentation of Dissertations at

<http://www.campus.manchester.ac.uk/medialibrary/researchoffice/graduateeducation/guidance-presentation-of-dissertations-pgt-0705.pdf>

All work must be original: students presenting work which is copied from any other source (unless explicitly allowed), including from other students, are breaking University regulations and will be dealt with under these regulations. Guidance on plagiarism is provided in the Programme handbook.

Students who achieve a dissertation mark of between 40-49% may accept the award of Postgraduate Diploma with no further work required or resubmit the dissertation on one occasion, at the discretion of the Board of Examiners.

A student achieving a mark below 50% for a resubmitted dissertation will be awarded a Postgraduate Diploma. The maximum mark to be awarded for resubmitted dissertations or projects will normally be 50% for the Masters degree and 40% for the Postgraduate Diploma.

Awards:

MSc with Distinction: An MSc with Distinction is awardable under the following circumstances:

1. The student must have passed the assessment for course units with an overall mark of at least 70% with no mark below 50% in any course unit.
2. the dissertation is submitted on-time and both the examiners award a mark of at least 70%. The recommendation is then passed to the External Examiner, who must agree to the recommendation for the award of a Distinction to be granted by the Faculty's MSc Panel
3. Students who have had to resit any unit(s) or have been granted a compensated pass will not be eligible for the award of distinction.

MSc with Merit: An MSc with Merit is awardable under the following circumstances:

1. The student must have passed the assessment for course units with an overall mark of at least 60% with no mark below 50% in any course unit
2. The dissertation is submitted on-time and both the examiners award a mark of at least 60%.
3. Students who have had to resit any unit(s) or who have been granted a compensated pass will not be eligible for the award of merit.

THE UNIVERSITY OF MANCHESTER

Postgraduate Programme Specification

MSc (Pass): To obtain a pass for an MSc degree, the student is required to obtain both an average of 50% on the taught element and 50% on the project/dissertation element.

Postgraduate Diploma – The University regulations are at:

<http://www.campus.manchester.ac.uk/medialibrary/policies/ordinance-master-pg-diploma-pg-certificate.pdf>

It is awarded to a student who has been assessed on 90 credits' worth of coursework & examination questions, and will normally be considered as passing the units if, in addition to the University regulations:

- (i) the credit weighted average is 40% or more on the course units, and
- (ii) the credit weighted average of the practical work is 40% or more, and the credit weighted average of the examination results is 40% or more, and
- (iii) course units whose overall results are below 40% amount to no more than 45 credits. These can be re-sat once and the maximum mark to be awarded will normally be 40%

In addition, for the Diploma, students are required to successfully complete a mini-project worth 30 credits and achieve a mark of 40% or more. This will consist of a report on work undertaken which is commensurate with one-third of a full 90-credit MSc project. It should have the same standards of literacy and presentation as an MSc dissertation.

Postgraduate Certificate – The University regulations are at:

<http://www.campus.manchester.ac.uk/medialibrary/policies/ordinance-master-pg-diploma-pg-certificate.pdf>

This is awarded to students who have successfully taken 60 credits' worth of coursework & examination questions with a result of 40% or more in each course unit.

Date of original production:	30 th July 2001
Date of current version:	16 th August 2006