

**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	Low Power System Integration (CEESI)	3-4 years	Modular/part-time/distance learning
PG Diploma	Low Power System Integration (CEESI)	2-3 years	Modular/part-time/distance learning (exit award only)
PG Certificate	Low Power System Integration (CEESI)	2 years	Modular/part-time/distance learning

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 Diploma is exit award only**):

<b>01.</b>	<b><u>At PG Diploma level:</u></b> Produce the highest quality of computing professionals in the area of low power systems integration
<b>02.</b>	Provide a vehicle for dissemination of leading-edge knowledge and skills, focusing on the research strengths of a large School in this area of knowledge
<b>03.</b>	Continue to attract the highest-quality students from the UK and overseas, offering the opportunity to focus on one specialisation
<b>04.</b>	Provide an opportunity to engage in a small research project in this area
<b>05.</b>	<b><u>At MSc level:</u></b> As above except that in place of 04: Offer the opportunity to focus on one of a range of specialisations.
<b>06.</b>	<b><u>At MSc level:</u></b> Provide high quality training and experience in research in Low Power System Integration

## 3. INTENDED LEARNING OUTCOMES OF THE PROGRAMME(S)

***NB These Learning Outcomes only apply to the course units and project which are under the direct supervision of academic staff in the Department of Computer Science at Manchester***

**(must include separate outcomes for PG Certificate and PG Diploma awards )**

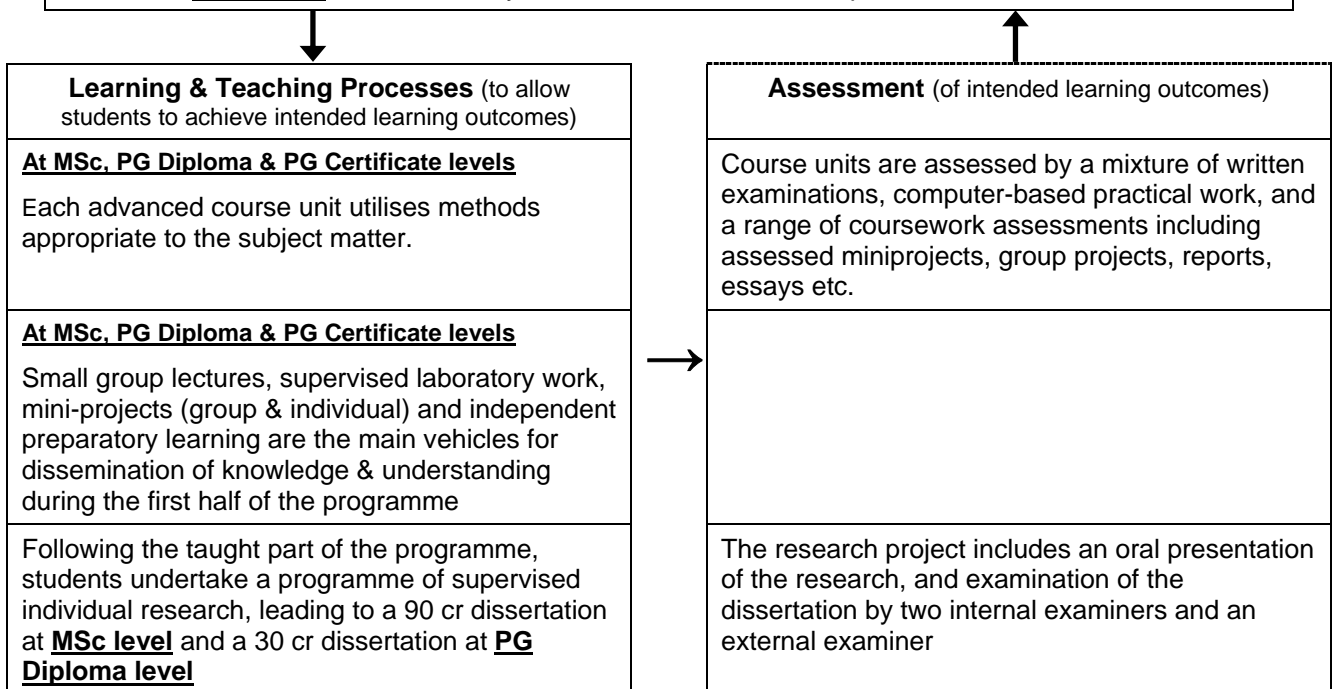
### A. Knowledge & Understanding

Students will be able to:

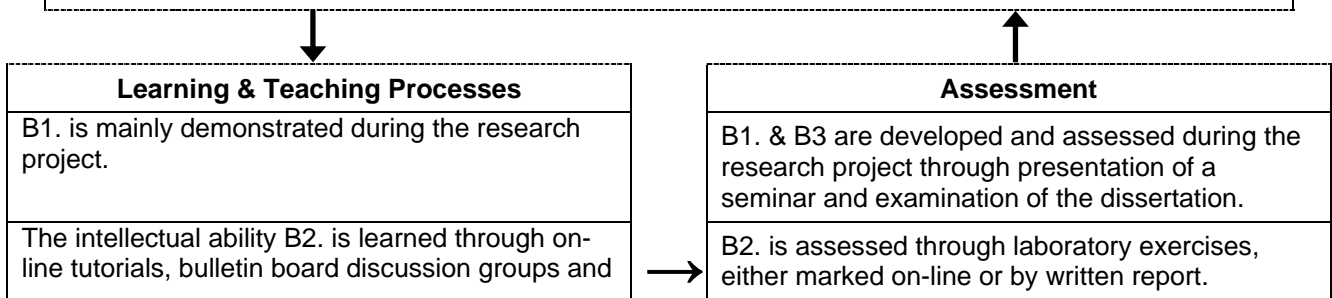
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<b>A1.</b>	<b>(All levels)</b> Acquire a knowledge of a range of advanced topics in Low Power System Integration beyond undergraduate level and at the forefront of research
<b>A2.</b>	<b>(All levels)</b> Understand the principles of the ARM and Thumb instruction sets and their practical use-
<b>A3.</b>	<b>(MSc &amp; PG Diploma)</b> Have a knowledge & understanding of research methodology & practice
<b>A4.</b>	<b>(All levels)</b> Understand the principles of low-power RISC processor design
<b>A5.</b>	<b>(All levels)</b> Understand the design of memory hierarchies for power-efficient systems, and acquire an ability to apply a systematic methodology to memory hierarchy design
<b>A6.</b>	<b>(All levels)</b> Understand the system-level issues involved in designing a particular power-sensitive application
<b>A7.</b>	<b>(All levels)</b> Understand the potential advantages of asynchronous systems
<b>A8.</b>	<b>(All levels)</b> Understand asynchronous data and control protocols



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



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practical lab exercises designed to put theoretical knowledge into practice.

B3. is mainly demonstrated during the research project, mini-projects and problem-based learning in teams.

B3 is also assessed by reports from mini-projects (individual & group).

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

<b>Learning &amp; Teaching Processes</b>
C1. and C3. are demonstrated in practical lab exercises and mini-projects, as well as during the research project.
C2. and C4. are demonstrated during the research project.
The practical skill C4. is demonstrated in the preliminary preparation for each course unit

<b>Assessment</b>
C1. and C3. are assessed through laboratory exercises, either marked on-line or by written report.
C2. and C4. are developed and assessed during the research project through presentation of a seminar and examination of the dissertation
C4. is also assessed by a report or marked presentation in some course units.

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

<b>Learning &amp; Teaching Processes</b>
D1. is evident in team practical project used in a number of course units
D2. is demonstrated during the research project seminar and also within a number of course units.

<b>Assessment</b>
D1. is assessed through reports and marked presentations.
D2. is assessed by two internal examiners during the research project seminar, who provide feedback on presentation skills.

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D3. is demonstrated through on-line exercises and mini-project reports and 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

D3. is assessed by the research project dissertation which is examined by two internal examiners and an external examiner.
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)**

<b>Programme structure and credits</b>	<b>Credits</b>
<p><b>Please indicate both compulsory units and optional units (including Choice of _ from _ ) , as well as requirements for exit awards and any specified pathways.</b></p>	
<p><b><u>Year 1</u></b>            One of CS70042 or Optional course unit in Semester 1            One of COMP70212 or Optional course unit in Semester 2            Progression to Year 2 is based on only taking a maximum of 2 course units under the 40% pass level over all units studied. The majority of course units are taught distance learning, employing different established DL methods</p>	<p>15 15</p>
<p><b><u>Year 2</u></b>            One of COMP70042 or Optional course unit in Semester 1            One of COMP70212 or Optional course unit in Semester 2            Progression to Year 2 is based on only taking a maximum of 2 course units under the 40% pass level over all units studied. Most course units are assessed through coursework (66%) and end-of-unit examination (34%)</p>	<p>15 15 <b>(PG Cert exit with 60 credits)</b></p>
<p><b><u>Year 3</u></b>            One of COMP70042 or Optional course unit in Semester 1            One of COMP70212 or Optional course unit in Semester 2            Progression to project if 90 credits achieved.</p>	<p>15 15</p>
<p><b><u>Year 4</u></b>            Research project – selected with academic staff in the research area, either from topics suggested by the research group or topics selected from the workplace</p>	<p><b>90 (MSc)</b>  <b>30 (PG Dip exit with 90 + 30)</b></p>

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

**Induction**

**Year 1/Year 2/Year 3**

Course units are taught in distance learning mode.

**Year 4**

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.

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 Department 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 CS699.

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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	A4	A5	A6	A7	A8	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	D4
COMP60900	Introduction (not assessed)	C	D	D																	
COMP70042	CEESI – Low Power System Design (DL)	C	A D	A D	A D	A D	A D	A D	A D	A D		A D	D	A D		D	D	D	A D	A D	
COMP70212	CEESI – Self-Timed Logic (DL)	C	A D	A D		A D	A D	A D	A D	A D	A D	A D		A D		D	D		A D	A D	
COMP60990	Research & Professional Skills (not assessed)	C			D						D		D		D			D		D	
COMP60900	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      **C** = compulsory course unit  
**A** = intended learning outcomes of the programme are assessed within this course unit      **O** = optional course unit

- CEESI = Low Power Systems Integration

**NB** The other course units are provided by consortium members and are governed by their institution's quality procedures. Students will have a personal study plan negotiated with the Manchester Programme Director where guidance as to the coherence of the course units selected will be given.

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### 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 1<sup>st</sup> class or good 2<sup>nd</sup> class honours degree or its overseas equivalent in either Computer Science/Electronic Engineering or a joint course with at least 50% Computer Science/Electronic Engineering content. An honours degree in another subject together with sufficient relevant industrial experience is also acceptable. 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/](http://www.cs.man.ac.uk/Study_subweb/Postgrad/) & the CEESI website: [www.ceesi.ac.uk](http://www.ceesi.ac.uk)

### 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 pass the taught part of the programme. The award of an MSc is then made entirely on the basis 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 regulations for passing the taught modules are as follows:

- 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 40% amount to no more than 30 credits.

The final decision on whether a student passes is taken by the Low Power System Integration 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.

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.

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 evidence of weakness in any subject area, and
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 GSSEM MSc Panel

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**Postgraduate Diploma** – is awarded to a student who has been assessed on 90 credits' worth of coursework & examination questions. These must include the two core course units (COMP70042 & COMP70212) delivered by the University of Manchester. A student will normally be considered as passing the units if:

- (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 30 credits.

The Diploma can only be awarded as compensation to a student who fulfils the above criteria and has achieved a mark of 40-49% in the dissertation assessment of the Masters programme (30 credits) Where the project has been undertaken under the supervision of an academic in the University of Manchester.

**Postgraduate Certificate** – 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. These must include the two core course units (COMP70042 & COMP70212) delivered by the University of Manchester

***NB The new University will have MSc regulations (as opposed to GSSEM as at present) – These have yet to be developed***

<b>Date of original production:</b>	30 <sup>th</sup> July 2001
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