Programme Specification and Curriculum Map for MSc Design Engineering and Manufacturing Management

1. Programme title	Design Engineering and Manufacturing Management
2. Awarding institution	Middlesex University
3. Teaching institution	Middlesex University
4. Programme accredited by	
5. Final qualification	MSc/PGDip/PGCert
6. Academic year	2014/2015
7. Language of study	English
8. Mode of study	Full time or Part time

9. Criteria for admission to the programme

Applicants will be expected to have a 2.1 or above honours degree or equivalent in an engineering based discipline. Graduates from other related disciplines such as Industrial Design or Engineering Product Design may also be admitted to the programme.

In addition, candidates will have such qualities as being creative, proactive and having a desire to engage with technology, engineering and manufacture, and be able to think as an individual but able to work in a team. Candidates should be able to show a keen interest in design and engineering. **All applicants will be required to specifically address these areas and how they see themselves in possessing these qualities in their personal statement.**

Candidates will need a high level of competence in the use of English, equivalent to at least 6.5 in the IELTS test or TOEFL 575 (paper based), 237 (computer based).

10. Aims of the programme

The programme aims to take graduates of engineering discipline and equip them with specialist knowledge in design and manufacturing management to fill vacancies in global markets.

11. Programme outcomes

A. Knowledge and understanding

On completion of this programme the successful student will have knowledge and understanding of:

1. Manufacturing processes and techniques.
2. A range of 2D and 3D computer aided engineering tools.
3. Professional responsibilities, including the global and social context of engineering and environmental issues of design.
4. Factory automation
5. Process planning and improvement
6. Designing research methods.
7. Management and business practices including PLM solutions.
8. Professional report writing and presentation.
9. Design thinking.
10. New product development
11. Product language and branding.

Teaching/learning methods

Students gain knowledge and understanding through design projects, reading, listening, working with industrial partners, observing, experimenting, constructing, drawing, writing, presenting and discussing.

Assessment Methods

Students' knowledge and understanding is assessed by project work, hands-on-tasks, coursework, presentations, conference presentation and the thesis.

B. Cognitive (thinking) skills

On completion of this programme the successful student will be able to:

1. Creatively solve engineering design problems.
2. Demonstrate critical thinking.
3. Make an argument.
4. Work on a number of concurrent tasks simultaneously.
5. Visualise problems in three dimensions.
6. Strategic decision making.

Teaching/learning methods

Students develop their cognitive skills through design projects, problem solving activities, presentations and through report and thesis writing.

Assessment Method

Students' cognitive skills are assessed by the products that they design, with particular reference to their engagement with the design process, and by coursework comprising of reports, essays and a thesis.

C. Practical skills

On completion of the programme the successful student will be able to:

1. Select appropriate design solutions.
2. Plan ahead and prioritise tasks.
3. Communicate and justify ideas.
4. Validate and optimise designs.
5. Design and implement manufacturing automation systems.
6. Use simulation to analyse and make process improvements.
7. Project management.

Teaching/learning methods

Students learn practical skills through design projects, experimenting.

Assessment Method

Students' practical skills are assessed by coursework comprising of projects, assignments and group and individual presentations.

D. Graduate Skills

On completion of this programme the successful student will be able to:

1. Work successfully within a team.
2. Communicate orally via professional presentations.
3. Communicate via professional written reports.
4. Handle numerate problems.
5. Work independently and autonomously.
6. Show diligence, thoroughness and attention to detail.
7. Develop business acumen.

Teaching/learning methods

Students develop their key skills throughout the programme. With the completion of the Thesis module, they will have become autonomous learners.

Assessment method

Students' key skills are assessed by:

Reports, essays, the thesis, presentations, team projects and taking part in a conference as a presenter.

12. Programme structure (levels, modules, credits and progression requirements)

12. 1 Overall structure of the programme

The MSc Design Engineering and Manufacturing Management programme is studied over either 12 months full-time or a minimum of 24 months part-time. Study is entirely undertaken at level 4. The programme is made up of a three modules running from the Autumn Term through to the Spring Terms (24 weeks contact) leading to the Thesis module that takes place over the Summer Term.

The course is divided into study units called modules. Each module has a credit value of either 30 or 60 credits. Each 30 credit module represents approximately 270 hours of student learning, endeavour and assessment.

Successful completion of the programme leads to the MSc award (180

credits).In the event of the Thesis module not being successfully completed, then the University may make an award of postgraduate diploma provided all of the other modules have been successfully completed and 120 credits are achieved. Exiting the programme with 60 credits will result in a Postgraduate Certificate being awarded. For the award of a Postgraduate Diploma will require completion of 120 credits. Classification of the MSc award will be based on the distribution of Level 4 grades and the Dissertation grade and this will conform to University regulation E4.6.

The programme will not actively recruit for PgCert or PgDip awards but will use these awards to compensate students who will need to exit during the programme based on the number of credits completed at the time.

Assessment Schedule

PDE 4220 Principles of Design Engineering and Manufacturing Management:

Coursework submission deadline – week 23)
'Conference' - (date to be announced)

PDE 4221 Advanced Manufacturing Engineering and Management Practice:

CAD – week 10
Automation – week 16
WITNESS – University deadline

PDE 4222 Engineering Project

Short Project: 20%
Report: 2,000 words 60% - Week 3
Oral Presentation: 40% - Week 4

Main Project: 80%:
Report: 4000-5000 words detailing the proposed solution 50% - Week 22
Prototype or Simulation model: 25% - Week 22
Oral Presentation: 25% - Week 23

12.2 Levels and modules		
Level 7 (4)		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
Students must take all of the following: PDE 4220 Principles of Design Engineering and Manufacturing Management (30 credits) PDE 4221 Advanced Manufacturing Engineering and Management Practice (60 credits) PDE 4222 Engineering Project (30 credits) PDE 4602 Thesis (60 credits)		**For PgCert award the candidates must complete any combination of 60 credits from the modules:** **PDE4220, PDE4221, PDE4222** **For PgDip award, the candidate must complete 120 credits and must successfully pass modules:** **PDE4220, PDE4221 and PDE4222** **Must obtain 120 credits at level 4 in order to progress onto Thesis module.** **MSc (180 credits)**

12.3 Non-compensatable modules (note statement in 12.2 regarding FHEQ levels)	
Module level	Module code

13. Curriculum map
See Curriculum Map attached

14. Information about assessment regulations

Please refer to the University Regulations for generic guidance, and the Programme Handbook, under the Assessment section, for additional information.

15. Placement opportunities, requirements and support (if applicable)

There will be **no** placement requirement for this programme. However, the programme will arrange industrial visits and seek relevant industrial partnerships. There will be strong involvement from industrial partners in terms of sponsored projects and specialist lectures. The subject already benefits from four Visiting Professors who are practising in related industries.

16. Future careers (if applicable)

Graduates from the programme will be expected to enter into design engineering with highly specialised manufacturing engineering skills that are much sought after qualities worldwide. The programme content will be enriched by keeping industrial partner's engagement active and offering sponsored projects. This will also help to support the students about the current opportunities and future trends in their relevant employment sector.

17. Particular support for learning (if applicable)

Meeting the learning outcomes of this programme requires active participation in the subject and the development of autonomous practice in meeting design objectives. Supporting this level of active participation and autonomous practice is achieved via regular tutorial contact with academic staff, productive and informed support from technical staff and the use of online, resource-based learning materials where appropriate. The programme team will normally have weekly tutorial sessions as a panel to guide the development of work. Peer group will also be able to contribute to the support provided in these sessions. In the case of sponsored projects, industrial partners will also be part of the panel for offering guidance and support.

The subject provides extensive studio, laboratory and workshop facilities where students can engage with their coursework assignments in a supported and productive environment.

18. JACS code (or other relevant coding system)
H700

19. Relevant QAA subject benchmark group(s)
Engineering (2006)

20. Reference points
University Regulations. University's learning, teaching and assessment policy strategy.

21. Other information
N/A

Please note programme specifications provide a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve if s/he takes full advantage of the learning opportunities that are provided. More detailed information about the programme can be found in the programme handbook and the University Regulations.

Curriculum map for MSc Design Engineering and Manufacturing Management

This section shows the highest level at which programme outcomes are to be achieved by all graduates, and maps programme learning outcomes against the modules in which they are assessed.

Programme learning outcomes

Knowledge and understanding		**Practical skills**	
A1	Manufacturing processes and techniques.	C1	Select appropriate design solutions.
A2	A range of 2D and 3D computer aided engineering tools.	C2	Plan ahead and prioritise tasks.
A3	Professional responsibilities, including the global and social context of engineering and environmental issues of design.	C3	Communicate and justify ideas.
A4	Factory automation	C4	Validate and optimise designs.
A5	Process planning and improvement	C5	Design and implement manufacturing automation systems.
A6	Designing research methods.	C6	Use simulation to analyse and make process improvements.
A7	Management and business practices including PLM solutions.	C7	Project management.
A8	Professional report writing and presentation.		
A9	Design thinking.		
A10	New product development		
A11	Product language and branding.		
Cognitive skills		**Graduate Skills**	
B1	Creatively solve engineering design problems.	D1	Work successfully within a team.
B2	Demonstrate critical thinking.	D2	Communicate orally via professional presentations.
B3	Make an argument.	D3	Communicate via professional written reports.
B4	Work on a number of concurrent tasks	D4	Handle numerate problems.

	simultaneously.		
B5	Visualise problems in three dimensions.	D5	Work independently and autonomously.
B6	Strategic decision making.	D6	Show diligence, thoroughness and attention to detail.
B7		D7	Develop business acumen.

Programme outcomes																												
A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	C7	D1	D2	D3	D4	D5	D6	D7
Highest level achieved by all graduates																														
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Module title	**Module Code (Level)**	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	C7	D1	D2	D3	D4	D5	D6	D7
Principles of Design Engineering and Manufacturing Management	PDE4220 (7)			X			X	X	X	X				X	X			X		X	X						X	X		X	X	X
Advanced Manufacturing and Management Practice.doc	PDE4221 (7)	X	X		X	X		X			X	X		X		X	X		X		X	X	X	X	X				X	X	X	
Engineering Project	PDE4222 (7)					X		X	X		X		X			X			X	X	X	X			X	X	X	X	X		X	X
Thesis	PDE4602 (7)			X			X		X				X	X	X	X		X	X	X	X				X		X	X		X	X	