

Programme Specification



1. Programme title	M.Sc. BIM Management & Integrated Digital Delivery (BIMM & IDD)
2. Awarding institution	Middlesex University
3. Teaching institution	Middlesex University
4. Details of accreditation by professional/statutory/regulatory body	Professional body accreditation – CIOB (to be confirmed)
5. Final qualification	M.Sc. BIM Management & Integrated Digital Delivery PGDip. BIM Management & Integrated Digital Delivery PGCert. BIM Management & Integrated Digital Delivery
6. Year of validation Year of amendment	2019
7. Language of study	English
8. Mode of study	Distance Learning. Full Time 1 year / Part Time 2 years

9. Criteria for admission to the programme

- Degree qualification (minimum lower 2nd class) in an appropriate construction discipline (e.g. architecture, architectural technology, civil, mechanical, electrical engineering, surveying etc.) + 3 years relevant industrial experience

OR

- Corporate membership of a relevant professional body including 3 years of relevant industrial experience

OR

- Relevant industrial experience on a case by case basis
Candidates should also have creative, proactive qualities, ability to engage with technology, exercise leadership as an individual and work efficiently in teams. Applicants should supply evidence of the previous qualities in their personal statement.

Non-English native speakers are required to show 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:

1. Build the knowledge of how Building Information Modelling Management (BIMM) is a managed, enhanced processes and workflows approach to the collection and exploitation of information and 3D models across a construction/infrastructure project from conception to demolition.
2. Ensure that the candidates leaving the programme are BIM enabled with a critical awareness of contemporary Integrated Digital Delivery methods and techniques informed by technology, research and management skills in standard and unpredictable scenarios.
3. Provide practitioners in the property, construction and facilities sector, and related stakeholders providing services for it, with a qualification to be employed in a management role in Building Information Modelling (BIM) projects. These include technical BIM management positions, operational/administrative BIM management positions, and strategic BIM management positions.
4. Develop skills and understanding to work in a collaborative work environment
5. Develop critical thinking, leadership, team/personal and decision- making skills, and the ability to reflect upon strategic decisions.
6. Enhance learners' capabilities to negotiate, design and complete BIM projects/inquiries/activities which meet both their own needs and those of their employers/sponsors/organisations.

11. Programme outcomes*

A. Knowledge and understanding

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

1. Evaluate the interaction processes involved in designing, constructing and managing a building through use of BIM 3D models and data sets.
Recognise the importance of collaborative working

Teaching/learning methods

Students gain knowledge and understanding through given face-to-face or online lectures, analysis of existing or new design

<p>between disciplines nationally and internationally and influence/apply techniques and competencies to work collaboratively. (PGCert / PGDip)</p> <ol style="list-style-type: none"> 2. Identify and assess the risks and risk management techniques/procedures required for the successful implementation of a BIM project and integrate Quality assurance with risk registers. (PGCert / PGDip) 3. Critically analyse and select BIM management and Integrated Digital Delivery techniques to achieve the desired deliverables/handover and performance outcomes, through project, facilities and operations management, taking into account their social and economic global impacts. (PGCert / PGDip) 4. Comprehend contractual and legal requirements and their implications within the BIM processes, realising legal relationships of all the parties involved and their impact on related insurance issues, to be able to take actions accordingly in their management activities. (PGDip / MSc) 5. Define roles and responsibilities of all parties, including external supply chain, involved in a BIM or digitally enabled project to collaborate across different disciplines. To develop standards and protocols at institutional, sector and project level for control, feedback and analysis. These standards and protocols include what each contributor / stakeholder aims to achieve through the use of BIM. (PGCert / MSc) 6. Understand how BIM and Integrated Digital Delivery can contribute to making buildings energy and carbon efficient, sustainable and environmentally friendly and manage the processes required to optimise these outcomes. (MSc) 7. Devise solutions for complex, unpredictable situations and problem solving e.g. disaster mitigation and recovery, risk prediction within supply chains. Express good judgement decision-making for specialist and non-specialist stakeholders using new industry 4.0 technologies. (MSc) 	<p>projects, case studies, researching, reading, listening and working with industrial practitioners, observing, experimenting, drawing, writing, presenting and discussing</p> <p>Assessment methods</p> <p>Students' knowledge and understanding is assessed by reflective reports on competency checkpoints and issues analysed from previous or current projects they are involved in or given. Also online research and discussion journal feedbacks, project work evaluation, coursework, presentations, publications and critical analysis dissertation of module requirements.</p>
<p>B. Skills</p> <p>On completion of this programme the successful student will be able to:</p> <ol style="list-style-type: none"> 1. Manage the application of various BIM software 	<p>Teaching/learning methods</p> <p>Students develop cognitive skills through</p>

<p>packages, their integration, the necessary protocols and procedures needed for networks, database systems and information sharing. (PGCert)</p> <ol style="list-style-type: none"> 2. Identify and apply professional ethics, codes of conduct in different work scenarios and methods to protect the integrity of the models, datasets and process workflows. (PGCert / PGDip) 3. Select suitable research strategies and tools, including numeracy, qualitative and quantitative analysis of existing projects or case studies and logical reasoning skills to conduct in-depth research on management issues of projects using BIM processes and application of these issues to various situations. Also presenting an argument and formulating suitable conclusions. (PGCert / PGDip / MSc) 4. Identify, analyse and evaluate Key Performance Indicators (KPI) to help define and reach goals of the BIM processes and Integrated Digital delivery and evaluate its success in cost, quality and time. (PGDip / MSc) 5. Critically analyse organisational strategic management processes and apply them to: human resource development, Integrated Digital Delivery of projects, developing commercial, business, financial and marketing opportunities and constraints in adopting BIM processes, implementing Quality Assurance and Control procedures. (MSc) 6. Utilise oral and written communication skills to prepare clear, referenced reports, case studies, presentations and conferences objectively in both face-to-face and online scenarios. (PGCert / PGDip / MSc) 7. Manage self-learning plans, encourage Continuous Professional Development (CPD) and training to incorporate BIM and integrated digital delivery and demonstrate virtual management competences. (PGCert / PGDip / MSc) 	<p>analysis of existing or new design projects, face-to-face or online lectures, case studies, problem solving, analysis of a variety of scenarios and example applications, technical skills enhancement, observing, experimenting, presenting and discussing</p> <p>Assessment methods</p> <p>Students' cognitive skills are assessed by reflective reports on competency checkpoints and issues analysed from previous or current projects, project work evaluation, report and thesis writing, peer and self assessment, e-journal research and discussions, creative writing in problem solving, critical thinking, multitasking, strategic decision- making , appropriate design solutions, planning, prioritising tasks, validating and improving processes and project management</p>
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12. Programme structure (levels, modules, credits and progression requirements)

12. 1 Overall structure of the programme

<p>PDE 4301</p> <p>Technical BIM Management</p> <p>60 credits (PGCert)</p>	<p>PDE 4302</p> <p>Operational BIM Management</p> <p>60 credits (PGDip)</p>	<p>PDE 4303</p> <p>Strategic BIM Management (Thesis)</p> <p>60 credits (MSc)</p>
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The MSc Building Information Modelling Management programme is studied over either 12 months full time or 24 months part time. Study is entirely undertaken at level 7. The programme is made up of 3 consecutive modules comprising a 3-stage structure.

The 1st stage requires the mandatory module PDE4301 to be studied and awards 60 credits and the Certificate award on its successful completion. Its content about Technical BIM Management is taught using online synchronous webinars, discussion journals, case studies, occasional arranged face-to-face meetings, online material etc. The module is divided into 2 parts: i) taught competencies and ii) critical analysis for a simulated case study or for a project from prior experience of the candidate (APEL). Assessment requires preparing a reflective report by the participant showing evidence for performing the checklist of competencies and critical analyses required for this module upon analysing a simulated project or using a project from previous work experience. Assessment also includes weekly reflective journals about the topics discussed.

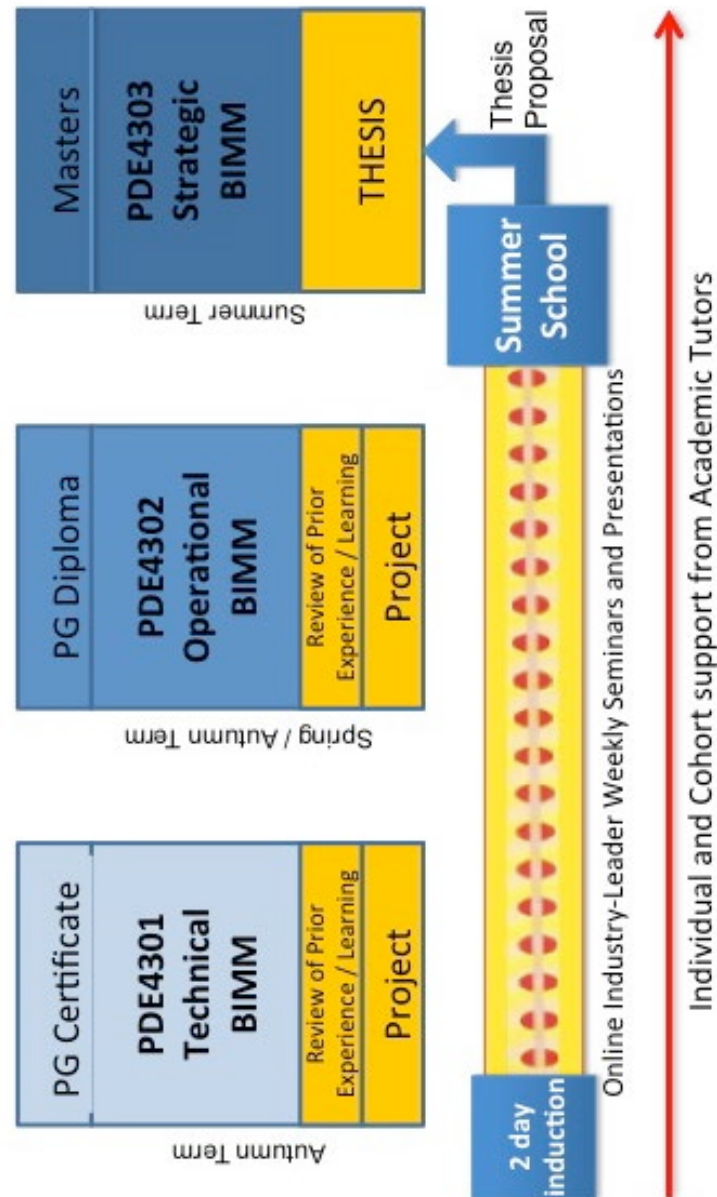
After completion of the 1st module, the candidate may wish to exit the programme or continue to study the 2nd stage - module PDE4302 - which awards another 60 credits and the Diploma award on its successful completion. Its content is about Operational BIM Management and is taught and assessed in the same manner as above.

After completion of the 2nd module, the candidate may wish to exit the programme or continue to study the 3rd stage - module PDE4303 - which awards another 60 credits and the Masters award on its successful completion and final accumulation of 180 credits. The module involves submission of a thesis providing original contribution to knowledge.

Throughout the stages of the programme there will be 24 weekly online synchronous webinars including Q & A delivered by experts in industry to the cohort about different learning objectives required in 3 stages of the programme.

Before starting the 3rd thesis module and in preparation for it, a “summer school” week of compulsory university full-day workshops must be attended in June/July, which can

be taken in the 1st or 2nd year before or after completion of the 2nd module, but at minimum after the 1st module is completed. During these workshops the cohort will reflect and provide feedback on all prior knowledge acquired within the previous 2 modules and guest lectures, with introduction of business games/scenarios/role-play and case studies. They will also propose their thesis topics, which will be discussed with the tutors and the rest of the cohort to enhance the research arguments to provide novel contribution to knowledge regarding Strategic BIM Management.



The programme starts with a 2-day compulsory induction workshop to set the theme for the whole programme, objectives, explain learning outcomes as aligned to government policies, provide an overview introduction to Building Information Modelling Management and induction for university online resources. Also by alignment of different backgrounds and experiences of the participants together, analysing how they reason and process information and identifying their individual requirements from the programme, it would

be possible to collaborate and merge their experiences.

The programme runs from the Autumn term through to the Spring term (24 weeks contact) during which the 1st only or 1st and 2nd modules may be completed leading to the 3rd thesis module that takes place over the Summer term, and which may only be taken upon completion of the first 2 modules. If only the 1st module is completed in the first year by the end of the Spring term, the candidate will finish the 2nd module in the 2nd year and must wait till summer term of the 2nd year to begin the 3rd thesis module.

Each module has a value of 60 credits. Each 60-credit module represents approximately 540 hours of student learning, endeavour and assessment. The candidate may exit the programme after any module to be awarded with a PGCert after 1st module (60 credits), PGDip after the second module (120 credits) or MSc upon completion of all 3 modules (180 credits). Classification of the MSc award will be based on the distribution of Level 7 grades and the Thesis 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.

12.2 Levels and modules

Starting in academic year 2010/11 the University is changing the way it references modules to state the level of study in which these are delivered. This is to comply with the national Framework for Higher Education Qualifications. This implementation will be a gradual process whilst records are updated. Therefore the old coding is bracketed below.

Level 7

COMPULSORY

OPTIONAL

PROGRESSION
REQUIREMENTS

<p>Students must take all of the following:</p> <p>PDE 4301</p> <p>Technical BIM Management (60 credits)</p> <p>PDE 4302</p> <p>Operational BIM Management (60 credits)</p> <p>PDE 4303</p> <p>Strategic BIM Management (60 credits)</p>		<p>For PGCert award, the candidates must successfully pass and complete 60 credits from the module PDE 4301</p> <p>To progress onto the PGDip award, the candidates must successfully complete module PDE 4301</p> <p>To progress onto the MSc award, the candidates must successfully complete modules</p> <p>PDE 4301 and PDE 4302</p>
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12.3 Non-compensatable modules (note statement in 12.2 regarding FHEQ levels)

Module level	Module code
7	PDE 4301
7	PDE 4302
7	PDE 4303

13. Curriculum map

See attached.

14. Information about assessment regulations

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

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. A series of 30 online/face-to-face guest lectures are compulsory for attendance and analysis by the candidates throughout the course of the programme.

16. Future careers (if applicable)

Graduates from the programme will be qualified and expected to take on a managerial role in Business Information Modelling construction and infrastructure projects either on a technical, operational or strategic level within an organisation. Examples are Model managers, BIM coordinators, BIM leads, BIM managers, BIM champions, BIM directors from any stakeholder's side whether the consultant, contractor, client etc. Graduates will have highly specialised technical, analytical and collaborative operational and strategic decision-making skills that are much sought after qualities due to the novelty of the area in concern worldwide. The programme content will be enriched by keeping industrial engagement and collaboration active, and offering sponsored projects. This will help reveal 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 development of autonomous practice in meeting objectives. Supporting this level of active participation is achieved via regular weekly face-to-face or online tutorial contact with academic staff, productive and informed support from technical staff, the use of online resource based learning materials and discussion tools. The programme cohort will normally have weekly discussion sessions for interaction, collaboration and sharing of experiences to guide development of work through peer support. In the case of sponsored projects, industrial partners will also be part of the panel for offering guidance and support. There will also be weekly seminars/webinars with Q&A delivered by guest lecturer experts in industry in different issues related to the studied modules.

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)	K220
19. Relevant QAA subject benchmark group(s)	Engineering (2006)

20. Reference points

- QAA Engineering subject benchmark statement (2006)
- QAA Framework for Higher Education Qualifications in England, Wales and Northern Ireland

- CIOB Education Framework for Masters Degree Programmes (2010)
- Middlesex University Regulations
- Middlesex university's learning, teaching and assessment policy strategy

21. Other information

Additional costs include travel of students to attend the compulsory induction 2-days and the 5-day thesis workshop

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 rest of your programme handbook and the university regulations.

Curriculum map for *MSc BIM Management & Integrated Digital Delivery*

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	
A1	Evaluate the interaction processes involved in designing, constructing and managing a building through use of BIM 3D models and data sets. Recognise the importance of collaborative working between disciplines nationally and internationally and influence/apply techniques and competencies to work collaboratively. (PGCert / PGDip)
A2	Identify and assess the risks and risk management techniques/procedures required for the successful implementation of a BIM project and integrate Quality assurance with risk registers. (PGCert / PGDip)
A3	Critically analyse and select BIM management and Integrated Digital Delivery techniques to achieve the desired deliverables/handover and performance outcomes, through project, facilities and operations management, taking into account their social and economic global impacts. (PGCert / PGDip)
A4	Comprehend contractual and legal requirements and their implications within the BIM processes, realising legal relationships of all the parties involved and their impact on related insurance issues, to be able to take actions accordingly in their management activities. (PGDip / MSc)
A5	Define roles and responsibilities of all parties, including external supply chain, involved in a BIM or digitally enabled project to collaborate across different disciplines. To develop standards and protocols at institutional, sector and project level for control, feedback and analysis. These standards and protocols include what each contributor / stakeholder aims to achieve through the use of BIM. (PGCert / MSc)
A6	Understand how BIM and Integrated Digital Delivery can contribute to making buildings energy and carbon efficient, sustainable and environmentally friendly and manage the processes required to optimise these outcomes. (MSc)
A7	Devise solutions for complex, unpredictable situations and problem solving e.g. disaster mitigation and recovery, risk prediction within supply chains. Express good judgement decision-making for specialist and non-specialist stakeholders using new industry 4.0 technologies (MSc)

Skills	
B1	Manage the application of various BIM software packages, their integration, the necessary protocols and procedures needed for networks, database systems and information sharing. (PGCert)
B2	Identify and apply professional ethics, codes of conduct in different work scenarios and methods to protect the integrity of the models, datasets and process workflows. (PGCert / PGDip)
B3	Select suitable research strategies and tools, including numeracy, qualitative and quantitative analysis of existing projects or case studies and logical reasoning skills to conduct in-depth research on management issues of projects using BIM processes and application of these issues to various situations. Also presenting an argument and formulating suitable conclusions. (PGCert / PGDip / MSc)
B4	Identify, analyse and evaluate Key Performance Indicators (KPI) to help define and reach goals of the BIM processes and Integrated Digital delivery and evaluate its success in cost, quality and time. (PGDip / MSc)
B5	Critically analyse organisational strategic management processes and apply them to: human resource development, Integrated Digital Delivery of projects, developing commercial, business, financial and marketing opportunities and constraints in adopting BIM processes, implementing Quality Assurance and Control procedures. (MSc)
B6	Utilise oral and written communication skills to prepare clear, referenced reports, case studies, presentations and conferences objectively in both face-to-face and online scenarios. (PGCert / PGDip / MSc)
B7	Manage self-learning plans, encourage Continuous Professional Development (CPD) and training to incorporate BIM and integrated digital delivery and demonstrate virtual management competences. (PGCert / PGDip / MSc)

Programme outcomes													
A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7
Highest level achieved by all graduates													
7	7	7	7	7	7	7	7	7	7	7	7	7	7

Module Title	Module Code by Level	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7
Certificate Level: Technical BIM Management	PDE 4301	X	X	X		X			X	X	X			X	X
Diploma Level: Operational BIM Management	PDE 4302	X	X	X	X					X	X	X		X	X
Masters Level: Strategic BIM Management	PDE 4303				X	X	X	X			X	X	X	X	X