Middlesex
University
London

# Programme Specification

| 1. | **Programme title** | MSc Network Management and Cloud Computing<br><br>MSc Network Management and Cloud Computing with 3 months placement<br>[London only]<br><br>MSc Network Management and Cloud Computing with 12 months placement<br>[London only] |
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| 2. | **Awarding institution** | Middlesex University |
| 3a | **Teaching institution** | Middlesex University: HEN, DBI, MRU |
| 3b | **Language of study** | English |
| 4a | **Valid intake dates** | Sept – HEN; Sept & Jan (PT) – DBI; Sept - MRU |
| 4b | **Mode of study** | Full-Time & Part-Time |
| 4c | **Delivery method** | ☒ On-campus/Blended<br><br>☐ Distance Education |
| 5. | **Professional/Statutory/Regulatory body** | N/A |
| 6. | **Apprenticeship Standard** | N/A |
| 7. | **Final qualification(s) available** | MSc Network Management and Cloud Computing,<br><br>MSc Network Management and Cloud Computing with 3 months placement,<br><br>MSc Network Management and Cloud Computing with 12 months placement<br><br>PGDip MSc Network Management and Cloud Computing |

| | PGCert Network Management and Cloud Computing |
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| **8.**     **Academic year effective from** | **2024/25** |

| **9.**     **Criteria for admission to the programme** |
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Applicants should normally have one of the following:

- A second class or higher honours degree in a computing discipline awarded by a UK university or a qualification deemed by the University to be equivalent.
- A second class or higher honours degree in an appropriate mathematical or engineering discipline with relevant knowledge of computing and significant industrial experience pertaining to a relevant role (such as a software developer or computer programmer role) within the computing sector (with a minimum of five years' full-time postgraduate employment in that role).

International students whose first language is not English or who have not been taught in the English medium throughout, and whose first degree is not from a British university, must achieve an IELTS score of 6.5 with a minimum score of 6.0 in each band.

University policies supporting students with disabilities apply, as described in the University Regulations, 'Information for Students with Disabilities'.

| **10.**     **Aims of the programme** |
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The programme aims to:

The programme aims to equip students with:

- An awareness of the fundamental importance of cloud computing and information management related to the business objectives of an organisation.

- Ability to involve both the management and the user in the process of awareness, decision, and implementation of a computer network.

- Ability to prepare a project budget and implementation strategy appropriate for the management of a major IT project.

- Ability to evaluate cloud computing architecture as well as organisational and economic aspects of developments as new opportunities for business process redesign and/or expansion.

- Ability to make a functional and technical design of an information system based on project goals and company's standards and quality systems.

- Ability to evaluate the performance of a communication system using analytical and/or simulation tools and manage the implementation of a complete communication design project.

## 11. Programme outcomes*

**A. Knowledge and understanding**

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

1. current network systems with an emphasis on those systems that integrate existing technologies and their applications in novel ways for increased organisational efficiency.
2. computer networks and the Internet as an enabling technology including the theoretical underpinnings of computer networks and their topologies.
3. cloud computing theory that underpins the analysis and design of such systems as well as the ability to analyse and identify the main threats to cloud computing systems security.
4. the technical aspects of cloud computing and the operation of computer networks, with an appreciation of the capabilities of intranets and internetworks.
5. the theoretical underpinnings of operating systems and application environments.
6. the use and operation of network management software and cloud computing access policies.
7. explaining and applying the basic processes involved in planning and implementing IT projects.
8. critically evaluating IT product/system performance and recommend improvements supported with evidence/arguments and draw up a system requirements specification.

**Teaching/learning methods**

Students gain knowledge and understanding through:

• Traditional lecture delivery (outcomes A1-A8)

• Group and individual research, presentations, and written reports (outcomes A4-A5, A7-A8)

• Laboratory sessions (outcome A2-A5, A7-A8)

• The use of various network software ranging from operating systems to applications (outcomes A5-A7)

• The individual project

Throughout the students are encouraged to undertake independent reading both to supplement and consolidate what is being taught / learnt and to broaden their individual knowledge and understanding of the subject (outcomes A1-A8)

**Assessment methods**

Students' knowledge and understanding is assessed by:

Group and individual coursework, presentations, group and individual reports, and the in-Class activities and the project thesis assess students' knowledge and understanding.

• Outcomes A1-A8 assessed by in-Class activities.

• Outcomes A2, A5 – A7 are assessed by laboratory sessions and practical assignments.

Outcome A1-A8 is assessed by individual essay and final project thesis.

**B. Skills**

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

**Teaching/learning methods**

Students learn skills through:

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| 1. critically evaluate the need for information networks and cloud computing systems in an organisational context.<br><br>2. apply network modelling, analysis and simulation skills.<br><br>3. demonstrate an understanding of the commercial possibilities of the Internet, cloud computing and the Web and their social implications.<br><br>4. demonstrate an understanding to identify the service level requirements for information networks.<br><br>5. create a network model, use this model to describe the current network situation, identify system risks and security issues.<br><br>6. provide a critical analysis of various NOSs and access mechanisms in cloud computing and show an appropriate technical understanding of security and implementation issues.<br><br>7. analyse and identify the main threats to network security and cloud computing systems.<br><br>8. evaluate and implement computer networks for companies and organisations.<br><br>9. configure and operate network management software (SNMP)<br><br>10. install and administer NOSs such as Linux, MS Windows, and Android | • Traditional lecture delivery (outcomes B1-B10)<br><br>• Group research (outcomes B1, B4, B8)<br><br>• Presentations and written reports (outcomes B1, B2, B4)<br><br>• Small group and individual exercises (outcomes B1-B4)<br><br>• Laboratory sessions (outcome B4)<br><br>• The use of various network software ranging from operating systems to applications (outcomes B3-B4 and B10)<br><br>• Individual and group design work (outcomes B1-B4)<br><br>• The project thesis (outcomes B1–B10 depending on project title)<br><br>Analysis, design, and problem-solving skills are further developed through various design activities as well as case studies, and extensive computer laboratory sessions. Feedback is given to students on all assessed coursework as well as in-class activities.<br><br>**Assessment methods**<br>Students' skills are assessed by<br><br>• Group and individual coursework (outcomes B1-B4)<br>• Presentations (outcome B1)<br><br>• Laboratory logbooks (outcome B4)<br><br>• Reports (outcomes B1, B2, B4 and B10)<br><br>• The in-Class activities (outcomes B1-B10)<br><br>• The project thesis (outcomes B1-B10 depending on project title) |

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

#### 12.1 Structure of the programme

The programme is structured to accommodate both full-time study, which may include an industrial placement for 3 months and 12 months, and part-time enrolment. The standard University academic year consists of 24 weeks, divided into two semesters of approximately 12 weeks each. Students have the flexibility to commence the program either in the Autumn semester (September) or the Winter semester (January).

The programme comprises 120 credits of compulsory taught modules and a 60-credit postgraduate project module. For an MSc award a total of 180 credits must be attained. For a PGDip (exit) award, 120 credits must be attained, i.e., all taught modules. For a PGCert (exit) award, a minimum of 60 credits must be attained and there is no restriction on which taught modules must be completed to make up those 60 credits. All taught modules are compulsory. Full-time students study the taught modules over a period of 24 weeks. Following the completion of the taught modules, students undertake the project module (60 credits) over the next term to complete the programme in approximately one calendar year. The programme structure is illustrated below.

## Your Modules

### Full-Time/ Part-Time

| MSc Network Management and Cloud Computing | | | | |
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| **Level 7 Terms 1 & 2** | CST4540 Network Management (30credits) | CST4570 Virtualisation and Cloud Computing (30 credits) | CST4500 Computer Networks and Internetworking (15 credits) | CST4522 Operating Systems for Networked Environments (15 credits) |
| | | | CST4580 Enterprise Network Troubleshooting (15 credits) | CST4560 Network Security and Mechanisms (15 credits) |
| **Optional Term(s)** | CST4840 PG Work Experience (3 months) (0 credits) | | CST4850 PG Work Experience (12 months) (0 credits) | |
| Note for Part-time | Part-time students can select any one 30 credits modules and two 15 credits in one academic year followed by one more module (30 credits) and two 15 credits in the next academic year. | | | |
| Level 7 Term 3 | CST4599 Individual PG Project (60 credits) | | | |

Students may advance to the project stage with a 30-credit deficit but must successfully complete all taught modules before registering for the placement. The duration of the postgraduate project is one semester for full-time and two semesters for part-time students.

Part-time students typically study 60 credits of taught modules in their first academic year of study followed by a further 60 credits of taught modules in the following academic year. In this case, students are expected to study CST4599 in their second year as it includes content that is preparation for the dissertation. It is acceptable within the regulations of the learning framework for part-time students to study 30 credits in a given academic year provided the overall programme is completed within the specified timescale for part-time registration. This will require a module registration schedule to be designed with, and approved by, the programme leader.

Students may advance to the project stage with a 30-credit deficit but must successfully complete all taught modules before registering for the placement. The duration of the postgraduate project is one semester for full-time and two semesters for part-time students. Assessments for taught modules occur at the end of Winter and Spring semesters, with reassessment before the Autumn semester begins.

Assessments for taught modules occur at the end of the Winter and Spring semesters, with reassessment before the Autumn semester begins.

| 12.2 Levels and modules | | |
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| Level 7 | | |
| **Compulsory** | **Optional** | **Progression requirements** |
| Students must take all of the following:<br><br>**CST4500:** Computer Networks and Internetworking<br><br>**CST4522:** Operating Systems for Networked Environments<br><br>**CST4540**: Network Management<br><br>**CST4570:** Virtualisation and Cloud Computing<br><br>**CST4560:** Network Security and Mechanisms<br><br>**CST4580:** Enterprise Network Troubleshooting<br><br>**CST4599:** Individual PG Project | Full-time UK students may additionally take one of the following option modules:<br><br>Either CST4840 – Postgraduate Work Placement (3 months)<br>Or CST4850 – Postgraduate Work Placement (12 months) | Before progressing to the optional placement module, students are required to successfully pass all taught modules. However, students may advance to the project stage with a maximum of a 30-credit deficit. |

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*Please refer to your programme page on the website re availability of option modules

| 12.3 Non-compensatable modules | |
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| Module level | Module codes |
| 7 | CST4540, CST4570, CST4599 |

| 13. Information about assessment regulations |
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Information on how the University formal assessment regulations work, including details of how award classifications are determined, can be found in the University Regulations at

***https://www.mdx.ac.uk/about-us/policies/university-regulations***

Grades are awarded on the standard University scale of 1–20, with Grade 1 being the highest. To pass a module all components, both coursework and examination, must be passed individually with a minimum grade of 16. Failure in one of the components will result in the failure of the module.

For additional information on assessment and how learning outcomes are assessed please refer to the individual module narratives for this programme.

| 14. Placement opportunities, requirements and support (if applicable) |
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Industrial placement is offered as an optional opportunity for **full-time students in the UK.** Students can choose between a 3-month or 12-month placement duration.

Students are responsible for securing their placement through independent applications, with support available from our employability service, MDX Works. If a suitable placement opportunity has not been identified before the start of the optional placement module due to unsuccessful applications or unsuitability, students will proceed directly to the Project module.

| 15. Future careers / progression |
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Successful students will be well placed for a range of roles in the professional computing sector, and the strong research underpinning of the programme provides a platform for further research activity.

| 16. Particular support for learning |
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For more information please check this link:

http://unihub.mdx.ac.uk/study

The Department of Computer Science Teaching and Learning Strategy is compliant with those of the University, in seeking to develop learner autonomy and resource-based learning. In support of the students learning experience:

- All new students go through an induction programme and some have early diagnostic numeric and literacy testing before starting their programme. The Learning Enhancement Team (LET) provides one-to-one tutorials and workshops for those students needing additional support in these areas.

- Students are allocated a personal email account, secure networked computer storage and dial-up facilities.

- A programme handbook is made available to students at enrolment (electronic copies for all students are available via virtual learning environment).

- New and existing students are provided with electronic module handbooks for each module they study Web-based learning materials are provided to further support learning.

- Extensive library facilities are available at the base campus.

- Students can access advice and support on a wide range of issues from the Student Services Counter and the Student Information Desk. Student Advisers aligned to subject areas offer confidential one to one advice and guidance on programme planning (if applicable) and regulations.

- High quality specialist laboratories equipped with industry standard software and hardware where appropriate, for formal teaching as well as self-study.

- Tutorial sessions for each module organised for groups of up to 20 students are provided for additional teaching support.

- Feedback is given on completion of all formative assessments.

- Where applicable, past exam papers for all modules (which are assessed by examination) are available for students via Unihub.

- Research activities of academic staff feed into the teaching programme, which can, on some occasions, provide an opportunity for students to work with academics on some aspect of research.

Middlesex University encourages and supports students with disabilities. Some practical aspects of Computer Science programmes may present challenges to students with particular disabilities. You are encouraged to visit our campuses at any time to evaluate facilities and talk in confidence about your needs. If we know your individual needs we'll be able to provide for them more easily. For further information contact the Disability Support Service (email: disability@mdx.ac.uk).

| 17. | HECos code(s) | 100366 |
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| 18. | Relevant QAA subject benchmark(s) | Computing |
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| 19. | Reference points |
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The following reference points were used in designing the programme:

- QAA computing subject benchmark statement (master's degrees in computing 2011)
- QAA framework for higher education qualifications in England, Wales, and Northern Ireland
- QAA Quality code
- CLTE Learning and Quality Enhancement Handbook
- University's regulations for postgraduate taught programmes
- University equality and diversity policy document

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.

## 21. Curriculum map for *MSc Network Management and Cloud Computing*

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 |
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| A1 | Current network systems with an emphasis on those systems that integrate existing technologies and their applications in novel ways for increased organisational efficiency |
| A2 | Computer networks and the Internet as an enabling technology including the theoretical underpinnings of computer networks and their topologies |
| A3 | Cloud computing theory that underpins the analysis and design of such systems as well as the ability to analyse and identify the main threats to cloud computing systems security. |
| A4 | The technical aspects of cloud computing and the operation of computer networks, with an appreciation of the capabilities of intranets and internetworks |
| A5 | The theoretical underpinnings of operating systems and application environments. |
| A6 | The use and operation of network management software and cloud computing access policies. |
| A7 | Explaining and applying the basic processes involved in planning and implementing IT projects. |
| A8 | Critically evaluate IT product/system performance and recommend improvements supported with evidence/arguments and draw up a system requirements specification |
| | **Skills** |
| B1 | Critically evaluate the need for information networks and cloud computing systems in an organisational context. |
| B2 | Apply network modelling, analysis and simulation skills |
| B3 | Demonstrate an understanding of the commercial possibilities of the Internet, cloud computing and the Web and their social implications |
| B4 | Demonstrate an understanding to identify the service level requirements for information networks |
| B5 | Create a network model, use this model to describe the current network situation, identify system risks and security issues |
| B6 | Provide a critical analysis of various NOSs and access mechanisms in cloud computing and show an appropriate technical understanding of security and implementation issues |
| B7 | Analyse and identify the main threats to network security and cloud computing systems |
| B8 | Evaluate and implement computer networks for companies and organisations |
| B9 | Configure and operate network management software (SNMP) |
| B10 | Install and administer NOSs such as Linux, MS Windows and Android |

| Module Title | Module Code by Level | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | B9 | B10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Computer Networks and Internetworking | CST4500 | ✔ | ✔ | ✔ |  |  |  |  | ✔ | ✔ | ✔ |  |  |  | ✔ | ✔ | ✔ |  | ✔ |
| Operating Systems for Networked Environments | CST4522 | ✔ | ✔ | ✔ |  | ✔ | ✔ | ✔ |  | ✔ | ✔ | ✔ |  | ✔ |  | ✔ | ✔ | ✔ |  |
| Network Management | CST4540 | ✔ | ✔ | ✔ |  |  | ✔ |  |  | ✔ | ✔ | ✔ | ✔ | ✔ |  | ✔ |  |  | ✔ |
| Network Security and Mechanisms | CST4560 | ✔ |  | ✔ | ✔ |  | ✔ | ✔ |  |  | ✔ |  |  |  | ✔ | ✔ | ✔ | ✔ |  |
| Virtualisation and Cloud Computing | CST4570 |  | ✔ |  |  | ✔ |  | ✔ | ✔ |  |  | ✔ |  |  | ✔ |  | ✔ | ✔ | ✔ |
| Enterprise Network Troubleshooting | CST4580 |  |  |  | ✔ | ✔ |  |  |  | ✔ | ✔ | ✔ | ✔ |  | ✔ |  | ✔ |  |  |
| Individual PG Project | CST4990 | ✔ | ✔ |  |  | ✔ |  | ✔ | ✔ |  | ✔ |  | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |