Programme Specification

MSc Network Management and Cloud
Computing

Middlesex University London

1. Programme title	MSc Network Management and Cloud Computing
2. Awarding institution	Middlesex University
3. Teaching institution	Middlesex University
4. Details of accreditation by professional/statutory/regulatory body	
5. Final qualification	MSc
6. Year of validation **Year of amendment**	
7. Language of study	English
8. Mode of study	FT/PT

9. Criteria for admission to the programme
Applicants should normally have one of the following: A minimum of second class Honours degree (UK), or a degree deemed by the University to be equivalent, in computer science or networks, or in a field that provided significant exposure to IT, for example, management, business, mathematics, science or engineering Degrees in other fields combined with relevant industrial experience of at least five years, together with an extensive IT background **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 or TOEFL 575 (paper based) 233 (computer based). *Note: University policies supporting students with disabilities apply, as described in the University Regulations, 'Information for Students with Disabilities'.*

10. Aims of the programme

The programme aims to develop:

- An awareness of the fundamental importance of cloud computing and information management related to the business objectives of an organisation
- The ability to involve both the management and the user in the process of awareness, decision and implementation of a computer network
- The ability to prepare a project budget and implementation strategy appropriate for the management of a major IT project
- The 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
- The ability to make a functional and technical design of an information system based on project goals and company's standards and quality systems

The 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	Teaching/learning methods
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 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 computer networks, international standards, network topologies and related technologies	. Students gain knowledge and understanding through: - Traditional lecture delivery (outcomes A1-A7, A10, A11 and A13) - Group and individual research, presentations and written reports (outcomes A9, A10, A11 and A17) - Laboratory sessions (outcome A8, A9, A12 and A14) - The use of various network software ranging from operating systems to applications (outcomes A8 and A12) - Individual and group design work (outcomes A8, A12 and A14) - 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-A13).

6. The use and operation of network management software and cloud computing access policies. 7. Analyse and identify the main threats to cloud computing systems security. 8. Explain and apply the basic processes involved in planning and implementing IT projects	**Assessment Methods** Students' knowledge and understanding is assessed by: Group and individual coursework, presentations, group and individual reports, and the unseen examination and the project thesis assess students' knowledge and understanding. • Outcomes A1-A8, are assessed by examination • Outcomes A6, A7 and A8 are assessed by laboratory sessions
B. Cognitive (thinking) skills On completion of this programme the successful student will be able to: 1. Critically evaluate the need for information networks and cloud computing systems in an organisational context 2. Apply network modelling, analysis and simulation skills 3. Demonstrate an understanding of the commercial possibilities of the Internet, cloud computing and the Web and their social implications 4. Identify the service level requirements for information networks 5. Use probability theory to analyse computer networks and cloud computing 6. Create a network model, use this model to describe the current network situation, identify system risks and security issues 7. Provide a critical analysis of various NOSs and access mechanisms in cloud computing and show an appropriate technical understanding of security and implementation issues 8. Analyse and identify the main threats to network security and cloud computing systems	**Teaching/learning methods** Students learn cognitive skills through • Traditional lecture delivery (outcomes B1-B12) • Group research (outcomes B1, B4, B8) • Presentations and written reports (outcomes B1, B2, B4) • Small group and individual exercises (outcomes B1-B4) • Laboratory sessions (outcome B4) • The use of various network software ranging from operating systems to applications (outcomes B3-B4) • Individual and group design work (outcomes B1-B4) • The project thesis (outcomes B1–B12 depending on project title) 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 written exams (in the form of exam reports produced each term) **Assessment methods** Students' cognitive skills are assessed by • Group and individual coursework (outcomes B1-B4) • Presentations (outcome B1) • Laboratory logbooks (outcome B4)

	• Reports (outcomes B1, B2, B4, B10 and B11) • The unseen examination (outcomes B1-B12) • The project thesis (outcomes B1-B12 depending on project title)
C. Practical skills On completion of the programme the successful student will be able to: 1. Apply appropriate techniques and solutions in an area pertinent to the student's own working and/or organisational background and interests 2. Draw up a system requirements specification 3. Evaluate and implement computer communication systems 4. Evaluate network performance and access policies in cloud computing 5. Configure and operate network management software (SNMP) 6. Install and administer NOSs such as Linux, MS Windows NT/2000 and Novell NetWare 4.x/5.x 7. Critically evaluate IT product/system performance and recommend improvements supported with evidence/arguments and draw up a system requirements specification .	**Teaching/learning methods** Students learn practical skills through the teaching and learning programme outlined above. These skills are also nurtured through • Small group discussions and individual exercises • Laboratory sessions (outcomes C4-C8) • On-line examples (outcome C1) • The individual/group research project (outcomes C1-C4) **Assessment methods** Students' practical skills are assessed by coursework reports and the thesis report. • Skills C1-C7 are assessed through coursework and written exam Skills C4-C7 are assessed by laboratory sessions
D. Graduate skills On completion of this programme the successful student will be able to:	**Teaching/learning methods** **Assessment methods** .

12. Programme structure (levels, modules, credits and progression requirements)
12. 1 Overall structure of the programme

The programme is designed as a full-time course including industrial placement where applicable, or as a part-time programme. The normal University year is split into two terms of approximately 24 weeks each and students can start the programme in either Autumn term (September) or winter term (Late January/February).

The programme conforms to the requirements of the New Academic Learning Framework (NLF) of Middlesex University and comprises seven taught modules (two worth 30cps each, four worth 15cps each and one 0cps) and a final project module (worth 60cps). Each 30cps module involves approximately 180 hours of study and each 15cps module involves approximately 90 hours of study. This includes attendance at lectures, tutorials, laboratory activities and study at home or in industry. All modules on the programme are compulsory.

1. **Full-time** students joining the programme in **September** pursue the following study schedule:
   ❖ six modules (totalling 120cps) for Autumn Term start (September)
   ❖ One project research and communications skills module (0cps) for Autumn/Winter Terms (weeks 6 to 18)
   ❖ Undertake the postgraduate project module (60cp) in the Summer Term

Students who enrol in September may be able to complete their project over the following Spring term, thereby completing the programme in one year.

2. **Full-time** students joining the programme in **January** pursue the following study schedule:
   ❖ six modules (totalling 120 cps) For Winter start Term (January)
   ❖ One project research and communications skills module (0cps) for Winter/Spring Terms (weeks 6 to 18)
   ❖ Undertake the postgraduate project module (60cp) in the Autumn Term

Students who enrol in January may be able to complete their project over the following Autumn, thereby completing the programme in one year.

3. **Part-time** students joining the programme in **September** pursue the following study schedule:
   ❖ three modules (60cps) in the Autumn Term of the 1st year
   ❖ three modules (60cps) in the Autumn Term of the 2nd year
   ❖ One project research and communications skills module (0cps) for Autumn/Winter Terms (weeks 6 to 18) of the 2nd year
   ❖ Undertake the postgraduate project module (60cp) in the Spring and Autumn Terms of the 2nd year

4. **Part-time** students joining the programme in **January** pursue the following study schedule (see page 16 below):
   ❖ three modules (60cps) in the Winter Term of the 1st year
   ❖ three modules (60cps) in the Spring Term of the 2nd year
   ❖ One project research and communications skills module (0cps) for Winter/Spring Terms (weeks 6 to 18) of the 2nd year Undertake the postgraduate project module (60cp) in the Spring and Autumn Terms of the 2nd year

STUDENTS MUST SUCCESSFULLY COMPLETE ALL THE MODULES OF THE TAUGHT PART OF THE PROGRAMME BEFORE THEY CAN REGISTER FOR THE PROJECT MODULE

The duration of postgraduate project is one term for full-time and two terms for part-time

students.

Examinations for taught modules take place at the end of the Winter and Spring Terms only, with a reassessment opportunity before the start of the Autumn Term. There are no examinations at the end of the Autumn Term.

The general teaching and learning strategy is a lecture programme, with a module handbook, handouts and tutorial material supported by seminar sessions and practical laboratory activities and extended exercises for private study.

Projects should be appropriate to the Programme studied (i.e. Computer Network Management) and supervised accordingly. All project proposals must be approved by the Programme Leader or a member of the academic team delegated by the Programme Leader. Students must pass all the taught modules before they can progress to the project.

12.2 Levels and modules		
Level 7		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS

| Students must take all of the following:

CCE4300
Computer Networks and Int

CCE4340
Network Management

CCE4320
Operating Systems and App
CCE4370
Virtualisation and Cloud Cor

CCE4360
Network Security and Servic

CCE4380
Enterprise Network Troubles

CCE4900
Project Research and Communication Skills

CCE4910
Postgraduate Project in Computer Communications | | **Students must <u>pass all the taught modules and including CCE4900</u> before they can progress onto the project.**

To pass a module, students must pass all components of assessment (i.e. examinations and/or coursework) |
| | | |

12.3 Non-compensatable modules (note statement in 12.2 regarding FHEQ levels)	
Module level	**Module code**
7	CCE4900

7	CCE4910

13. Curriculum map

See attached.

14. Information about assessment regulations

See University Guidelines

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

16. Future careers (if applicable)

17. Particular support for learning (if applicable)

18. JACS code (or other relevant coding system)	
19. Relevant QAA subject benchmark group(s)	

20. Reference points

21. Other information

Appendix 2: Curriculum Map

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.

Module	Code	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C5	C6	C7
Network Management	CCE4340	✓	✓	✓			✓			✓	✓	✓	✓	✓		✓	✓		✓	✓				✓
Operating Systems and Applications Environment	CCE4320	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓		✓	✓							✓
Network Security and Services	CCE4360	✓		✓	✓		✓	✓			✓				✓	✓	✓	✓	✓		✓			
Virtualisation and Cloud Computing	CCE4370		✓			✓		✓	✓			✓			✓		✓	✓				✓		✓
Enterprise Network Troubleshooting	CCE4380			✓	✓				✓		✓	✓				✓			✓		✓		✓	
Computer Networks and Internetworking	CCE4300	✓	✓	✓						✓	✓				✓	✓	✓		✓	✓				
Project Research and Communication skills	CCE4900	✓						✓	✓				✓			✓	✓	✓		✓	✓	✓	✓	✓
Postgraduate Project in Computer Communication	CCE4910	✓	✓			✓		✓	✓				✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓