Programme Specification

NET-SA-2016: Network Engineering (Systems Administration)

LU Foundation Degree in Science awarded by Lancaster University (FHEQ Level 5)

Programme Status: Approved | Version: 1

Introduction

This programme specification provides a summary of the main features of the Network Engineering (Systems Administration) programme and the learning outcomes that you as a student might reasonably be expected to achieve and demonstrate on successful completion of the programme.

Further detailed information related to this programme and the College can be found in the following resources:

- Programme Handbook
- B&FC Student Handbook
- B&FC Admissions Policy
- Work based and placement learning handbook (for foundation degrees)
- Student guide to assessment and feedback

Key Programme Information

Programme Code	NET-SA-2016
Programme Title	Network Engineering (Systems Administration)
Teaching Institution	Blackpool and The Fylde College
Professional, Statutory and Regulatory Body (PSRB) Accreditation	None
UCAS Code	
Language of Study	English
Version	1
Approval Status	Approved
Approval Date	12 July 2018
JACS Code	
Programme Leader	

Programme Awards			
Award	**Award Type**	**Level**	**Awarding Body**
LU Foundation Degree in Science	Foundation Degree (240 credits)	Level 5	Lancaster University

Programme Overview

Blackpool and the Fylde College remains committed to providing a highly responsive curriculum that is employment and future-focused and will enable you to develop the essential knowledge and skills that will prepare you for future success in work and life.

Businesses are increasingly reliant upon interconnected systems and networked infrastructures; as these systems continue to grow in size and importance, the number of job roles in computer networking increases alongside them. The need for organisations to protect themselves from the legal, political and economic ramifications derived from data losses or breaches of security is symbiotic with this reliance.

This Foundation Degree programme has produced significant numbers of graduates, the majority of whom have found employment in the area of networking. The combination of network security with network systems administration produces extremely well qualified graduate cohorts with broad, commercially desirable skill sets and qualifications. It produces self-directing IT

professionals with a wide range of career pathways available to them. Along with the technical skills referred to, you will develop your understanding of continuing professional development and the value of transferable skills.

The college has experience of delivering specialist HE networking courses linked to both the Cisco Curriculum, via the Cisco Networking Academy and the Microsoft Curriculum, via the Microsoft Academy. We have demonstrated that there is an established market for such globally recognised networking qualifications in the local area.

The FdSc Network Engineering (Systems Administration) programme intends to develop technical and professional skills in order that you meet the current expectations of industry.

The skills you will develop include the ability to:

- Apply networking and hardware skills that will enable the connection, control and maintenance of various devices, using both traditional and wireless connectivity
- Protect individual systems and corporate infrastructures from unauthorised and illegal hacking and industrial espionage
- Configure, maintain and recover server based solutions to SMEs and larger corporations
- Develop specialist Systems Administration skills to prepare Network Professionals for a range of in-demand industry roles
- Work independently and as part of a team, the ability to take instruction and work to deadlines, communication and adaptability
- Be creative, use initiative and develop problem solving skills
- Undertake a work placement and apply the full range of technical and professional skills acquired during the foundation degree in a real world context.

Admission Criteria

Admission to level 4 would normally be on the basis of the applicant possessing:

For Entry prior to 2017:

A minimum of 160 UCAS Points in an appropriate discipline.

We also welcome applications from those with relevant experience in lieu of the minimum entry requirements.

For Entry from 2017 (Updated UCAS Tariff):

A minimum of 64 UCAS Points in an appropriate discipline.

We also welcome applications from those with relevant experience in lieu of the minimum entry requirements.

Career Options and Progression Opportunities

The modules on the FdSc. will give you excellent technical expertise with some understanding of organisational contexts. This will be useful for those already working in IT Support to progress to a role of Network Technician or Network Engineer.

When you graduate you will have the technical skills and underpinning knowledge to become:

- Network Technician
- Systems Administrator (for small networks)
- Network Engineer
- Networking Contractor
- And many other opportunities

Upon completion of your Foundation Degree you can enhance your skills further with the specialist BSc. (Honours) Network Engineering (Systems Administration) Top up programme which is an additional year of study. Also, you may wish to pursue further Cisco qualifications or broaden your skills by studying another module here in Computing.

In addition, there is a focus on developing your transferrable skills to make you an attractive professional candidate capable across sectors.

The area of network engineering and systems administration opens up many emerging opportunities in what is an area of economic growth internationally. Many evolving technology concepts including virtualisation, cloud computing, Internet of Things and mobile computing open up exciting and numerous career progression routes for you in the future.

Some of the roles that this programme will prepare you for include:

- Network Manager
- Systems Administrator
- Lead Network Engineer
- Networking Contractor
- And many other opportunities

In addition, there is a focus on developing your transferrable skills to make you an attractive professional candidate capable across sectors.

Programme Aims

Foundation Degree aims:

- To provide students with a range of network administration cognitive abilities and skills.

- To develop skills in network engineering; with regard to design, implementation, maintenance of network systems; thus enabling students to formulate decisions and administrate network systems.

- To develop a range of transferable skills, techniques and personal qualities that are essential for successful performance in Higher Education and in working life.

- To provide a platform for further undergraduate study.

Programme Learning Outcomes

Level 5

Upon successful completion of this level, students will be able to:

1. Identify, explain and discuss the technical and theoretical disciplines and applications involved in the development and deployment of networks
2. Analyse the social, legal and ethical aspects of design, implementation and evaluation of a network
3. Apply mathematical principles required to design, implement and maintain network addressing schemes
4. Design, implement, secure and evaluate a network infrastructure drawing on supporting evidence and critically analyse, select and apply suitable tools and techniques

5. Communicate information in a variety of formats to a range of audiences using a range of media which evidences both academic and digital literacy skills
6. Work effectively as an individual and as a member of a team undertaking critical self-appraisal to support continued professional development, employability, lifelong learning and transferrable skills
7. Integrate and apply essential concepts, principles and practice in the development and implementation of sustainable, scalable networks

Programme Structure

Module	Level	Credits	%	Category	Description	Length/Word Count	Grading Method
Stage 1							
B4SCNET-SA: Introduction to Academic Study (Mandatory)	4	20	60%	Coursework: Other	Written piece and reflection	2000	Letter Grade
			40%	Practical: Other	Case study, analysis, interpretation (1500 words) and poster presentation (15 minutes	15	Letter Grade
NET401: Network Principles (Mandatory)	4	20	10%	Coursework: Other	End-of-Chapter Quizzes	30	Percentage Grade
			40%	Coursework: Case Study	Case Study	2400	Letter Grade
			20%	Written Exam: Formal Written Examination	CCNA 1 MCQ	60	Percentage Grade
			30%	Practical: Other	Lab Practical	60	Percentage Grade
NET402: Network Programming and Scripting Concepts (Mandatory)	4	20	40%	Coursework: Other	Network Programming - Report and Design	1600	Letter Grade
			60%	Coursework: Other	Network Programming - Implementation	2400	Percentage Grade
NET403: Introduction to Routing and Switching (Mandatory)	4	20	50%	Coursework: Case Study	Case Study	2000	Letter Grade
			20%	Written Exam: Formal Written Examination	On-line Exam	60	Percentage Grade
			30%	Practical: Other	Timed Assessment	60	Percentage Grade
NET404: Introduction to Systems Security (Mandatory)	4	20	50%	Coursework: Other	Passive and Active Reconnaissance	2000	Letter Grade
			50%	Coursework: Other	Developing a Security Strategy	2000	Letter Grade
NET405: Network Disaster Recovery (Mandatory)	4	20	25%	Coursework: Other	Disaster Recovery	1000	Letter Grade
			50%	Coursework: Other	Database Management and Recovery	2000	Letter Grade
			25%	Written Exam: Formal Written Examination	Exam	90	Percentage Grade
Stage 2							
BFC501-I: Work Based and Placement Learning (Mandatory)	5	20	60%	Coursework: Report	Report	3000	Letter Grade
			40%	Coursework: Critical Review	Critical Reflection & Presentation/Poster	2500	Letter Grade
NET501: Project Management (Mandatory)	5	20	70%	Coursework: Project	Project Assignment (Theoretical)	2800	Letter Grade
			30%	Written Exam: Formal Written Examination	Case Study Exam	90	Percentage Grade
NET502: Virtualisation and Cloud Computing	5	20	50%	Coursework: Other	Hypervisor Selection,	2400	Letter Grade

(Mandatory)					Evaluation and Cloud Security		
			25%	Practical: Other	Hyper V Implementation	180	Percentage Grade
			25%	Practical: Other	ESXi Implementation	180	Percentage Grade
NET521: LAN Technologies (Mandatory)	5	20	60%	Coursework: Case Study	n/a	2400	Letter Grade
			20%	Written Exam: Formal Written Examination	On-line Exam	60	Percentage Grade
			20%	Practical: Other	Timed Practical	120	Percentage Grade
NET522: Systems Configuration and Management (Mandatory)	5	20	50%	Coursework: Report	Investigative Report	2000	Letter Grade
			25%	Practical: Other	Lab Practical – Configuring Domain services	150	Percentage Grade
			25%	Practical: Other	Lab Practical – Data Manipulation	150	Percentage Grade
NET523: Enterprise Network Technologies (Mandatory)	5	20	60%	Coursework: Case Study	n/a	2400	Letter Grade
			20%	Written Exam: Formal Written Examination	On-line Exam	60	Percentage Grade
			20%	Practical: Other	Timed Practical	120	Percentage Grade

Programme Delivery: Learning and Teaching

Our strategy for teaching, learning and assessment is based on good practice identified in research literature for the subject discipline. In particular we adopt an approach that will draw on your experience and that of other students to inform different approaches to practical tasks and theoretical case studies, updates content based on contemporary developments in the subject area and develops your professional skills through reflective practice.

There is an emphasis on formative assessment whereby you will have opportunities to test your skills in practical sessions and submit draft written tasks to receive written and/or verbal feedback to help you improve your work prior to final submission of assessments. The formative assessments will be delivered in the context of the module content and additional support to help you improve will be identified through our tutorial framework where your Personal Tutor will liaise with key agents throughout the college (such as Higher Education Learning Mentors) to support your development.

YEAR 1 (LEVEL 4)

At Level 4 the 'Academic and Digital Literacies' module will prepare you in research, collation and presentation of information in a range of styles to a range of audiences. This is linked to the wider subject material of the curriculum including reflection upon activities and feedback received in other modules in Semester 1. A focus on reflecting upon your work in other modules will help you improve your practice and the development of academic skills with help you achieve in future module assessments and start you well on your development of transferrable graduate skills.

The 'Network Principles' and 'Introduction to Routing and Switching' modules feature hands-on practical activities utilising NetLab equipment reinforcing concepts provided as blended (online / multimedia) learning resources by Cisco and reinforced through lecture-led discussions. Consideration is given to the environments in which these skills would be practiced in industry,

inclusive of equipment selection and deployment which would be driven by business needs The 'Introduction to the Routing and Switching' module also employs the usage of Packet Tracer, which can simulate complex network architectures. This is employed as a practice tool before the application of hands-on practical skills so that particular issues can be avoided and this is also utilised to simulate more complex network architectures.

'Network Programming and Scripting Concepts' follows a similar style integrating practical activities into sessions based on demonstrations and discussions of how concepts are applied, supported by blended (online / multimedia) learning resources. Supported practical sessions on programming tasks will enable you to be supported when bugs are encountered and practice problem solving techniques to overcome coding issues. This module provides a basis for skills further developed in Systems Configuration and Management'

'Introduction to Systems Security' features practical activities embedded within larger scenarios with discussions on case studies considering the wider impact of security breaches including legal and ethical dimensions.

'Network Disaster Recovery' utilises case studies to help relate your understanding of concepts to real-world situations and allow for practice planning in a range of contexts. As the module moves towards the database management aspects more practical activities are integrated starting with demonstrations and then supported workshops where you will practice your skills with the ability to reflect and refine them through experience and feedback.

Overall, a largely practical approach is taken at Level 4 with an emphasis on you learning through doing, reflecting upon these tasks to develop your skills. This provides a foundation to become more critical and analytical as well as developing more complex practical skills at Level 5.

YEAR 2 (LEVEL 5)

At Level 5, the 'Project Management' and 'Work Based / Placement Learning' module are delivered throughout the year. Themes of leadership, collaboration and organisational contexts support each other in both modules. In 'Project Management', lecture-led discussions on group dynamics and collaboration can be applied in the workplace and reflected upon. Professionalism and approaches to handling change and risks amongst other themes can be examined from these lenses. These elements of the curriculum delivery support each other in viewing concepts in different contexts allowing for deeper construction of understanding.

'Project Management' makes use of lecturer-led discussions, analysis of case studies and seminars where approaches can be shared and a better understanding of core project management issues can be gained.

'LAN Technologies' and 'Enterprise Network Technologies' features many hands on activities through lecturer-led practical demonstrations, discussions, supported workshops and blended learning resources. However, the underpinning concepts and approaches to case studies emphasise more analysis and criticality considering the rationalisation of judgements to be made in specifying networks utilising these technologies in preparation for Level 6. The 'Systems Configuration and Management' module focuses on the setup, configuration and management of a domain and individual servers through the use of PowerShell (or suitable alternative) scripting. The provision of virtual servers with which to practice techniques as well as within the NetLabs enables more opportunities to experiment and further skills which can then be reflected upon within sessions.

'Virtualisation and Cloud Computing' incorporates practical demonstrations and experience in a manner similar to other practical modules, however the module emphasises academic enquiry to keep abreast of emerging technologies and how this may impact Network Managers, Security Professionals and their organisations. There will be an emphasis on practicing tasks at home to then inform content in the session providing a flipped classroom approach and allowing more

ground to be covered.

Delivery at level six will place more emphasis on you as an independent learner and bring your research to disseminate, analyse and discuss where appropriate. There is a larger emphasis on theoretical content at Honours level and our aim will be to support you in developing high level skills such as deeper analysis, critical evaluation and reflection.

Where there are practical activities, the basics will be delivered through demonstration and supervised labs however extending the skills to achieve highly will be your responsibility; the more additional work and research you put in the better the outcomes will be for you.

This is all the more important as the dissertation will be self-managed. Supervisors will be allocated based on level of knowledge academically or technologically to aid in completion of the dissertation yet appointments need to be managed by students to build their ownership of academic progress.

Whilst there are still lectures and activities, a much more student-led approach is utilised to build your expected graduate skills.

Programme Delivery: Assessment

YEAR 1 (LEVEL 4)

Formative Assessment

Formative assessment in 'Network Principles' and 'Introduction to Routing and Switching' utilises Cisco End of Chapter quizzes which are aligned to the Cisco curriculum and allow for an on-demand analysis of your achievement. In addition to this, formative tasks based around case study activities including network infrastructure designs, addressing schemes and example rationales are set to enable opportunities for constructive feedback ultimately enhancing your overall achievement. Within sessions there are practice practical sessions to provide opportunities for troubleshooting and improving techniques.

The 'Academic and Digital Literacies' module provides formative assessment opportunities through group discussions and reflective logs. Tasks include reports where you analyse sources and critique them, applying cognitive skills integral to academic enquiry. The feedback from these activities aims to build your skills in researching, analysing and synthesising information.

'Systems Management' makes use of supported practical sessions where formative feedback can be given verbally to improve your practical techniques. For the coursework element of these modules, draft tasks related to coursework reports will be set helping you to improve your technique and interpretation of underpinning knowledge in real-world scenarios.

'Network Programming and Scripting Concepts' will initially have draft written and design tasks for theoretical elements to enable opportunities for written and/or verbal feedback. For the programming elements there will be supported workshops where issues with debugging techniques and problem solving can be aided with through small demonstrations or discussions of potential techniques to enhance your practice.

'Network Disaster Recovery' will enable formative feedback opportunities through setting disaster recovery planning task related to case studies. The database design and implementation aspect of the module will set formative tasks for providing designs and server links so that aspects of the implementation can be improved upon.

'Introduction to Systems Security' includes practical activities in sessions that are supported by verbal feedback to aid in troubleshooting and improving your techniques where links to

underpinning knowledge are established. This module includes research and development of a security strategy and so formative tasks will be set to draft key elements of this providing opportunities for you to improve.

Summative (Graded) Assessment

In 'Network Principles' and 'Introduction to Routing and Switching' there are timed practical sessions, online multiple choice exams and report based case studies where network equipment is specified and justified as well as designs for network infrastructure and research into core networking concepts. The 'Network Principles' module integrates the Cisco End of Chapter quizzes as part of the summative component; these are then used throughout the other Cisco embedded modules as formative tasks.

'Network Programming and Scripting Concepts' includes two pieces of coursework. The first will focus on theoretical concepts and where scripting tasks would be appropriate to increase efficiency for network professionals and also design tasks for a small-scale program. The second assignment will include developing a network-based program according to the design, testing and evaluating it.

The 'Network Disaster Recovery' module includes a large coursework element; the first assessment includes disaster recovery planning linked to a real-world scenario to be justified based on referenced evidence. The second coursework assessment includes the design, implementation, backup and transfer of a database with choices made requiring justification based on core database principles. There is a written exam in this module which will revisit concepts from different lenses and applied to different situations; the placement of this exam in the programme also aids in preparing you for exams in later levels of the programme which are a larger weighting of the module assessment.

'Introduction to Systems Security' will include practical activities embedded in larger coursework-based assessments to reinforce the links between practical techniques and underpinning concepts with a range of analysis techniques assessed. Comparisons and contrast of a range of reliable sources is also emphasised to base judgments upon.

YEAR 2 (LEVEL 5)

Formative Assessment

'Work Based / Placement Learning' will include reflective tasks throughout although some will count towards the summative assessment of the module. Other formative assessment activities include writing CVs and PDP to develop your employability skills.

'Project Management' will include as part of the formative assessment tasks draft plans, draft documentation (such as Risk Assessments, PID) and tasks based on case studies with a view improving your approaches to planning, documentation, judgment and consideration of legal, social, ethical and economic impacts.

'Virtualisation and Cloud Computing' includes practical activities in sessions that are supported by verbal feedback to aid in troubleshooting and improving your techniques where links to underpinning knowledge are established. In this module the practicals will have several 'mock' sessions beforehand to allow you to hone their skills prior to summative assessment. Tasks will be set based on elements of the coursework including writing up research into evolving cloud technologies and comparing different cloud solutions.

'LAN Technologies' and 'Enterprise Network Technologies' builds on the first year modules utilising Cisco End of Chapter quizzes which are aligned to the Cisco curriculum enable on-demand analysis of your achievement. In addition to this, formative tasks based around a more critical approach to subject-specific literature and examination of principles and technologies is emphasised to develop your higher level abilities based on particular case studies. Within sessions there are practice practical sessions to provide opportunities for troubleshooting and

improving techniques and opportunities for linking feedback to underlying principles will be taken.

'Systems Configuration and Management' includes a large practical element, utilising PowerShell scripting techniques to configure domain services. Therefore there will be a large emphasis on supported workshops enabling you to practice and providing opportunities to check and correct approaches. For the written coursework, draft tasks can be submitted for verbal/written feedback.

Summative (Graded) Assessment

'Work Based / Placement Learning' will include a work placement negotiated with an employer in industry and also comprise several reflective logs that link practice in modules to experience in the workplace and resolving where theoretical and practical skills are utilised in this environment. This will also include their experiences of developing as a professional and building towards their career goals. A second assessment will include a poster presentation reflecting upon the experience as a whole. The summative assessment for this module reinforces reflection, employability and transferrable skills with the poster presentation.

'Project Management' has a coursework element that involves the planning and management of a networking based project including completion of all relevant documentation, justifications for choices made based on established methodologies and good practice in the profession. Critical analysis and judgement is emphasised in the assessment of the coursework. There is also an examination component which revisits core concepts from different angles and applies problem-solving skills to particular scenarios.

In 'LAN Technologies' and 'Enterprise Network Technologies' there are timed practical sessions, online multiple choice exams and report based case studies however approaches to researching and applying the concepts is emphasised to be based on more critical evaluation of suitable technologies and techniques suitable for the case studies building your higher level skills.

'Systems Configuration and Management' has two timed-practical sessions based on applying a range of practical skills. There is one piece of written coursework will re-examine their work and explore topics in more depth.

'Virtualisation and Cloud Computing' includes two timed practical assessments that focus on the deployment, configuration and testing of alternative virtualised solutions. The coursework element will examine wider issues and trends in cloud computing and implications this will have for network managers, comparing, contrasting and evaluating a wide range of reliable sources.

Programme Delivery: Work Based and Placement Learning

During the Foundation Degree you are expected to complete a minimum of approximately 100 hours of work placement. You are encouraged to secure these placements yourself through seeking out employers within the sector and through interview, applications or negotiation ascertain what your responsibilities will be and how they will be supported. It is expected that your placement has a direct relationship to the course content and so therefore you need to keep the academic staff aware of your intentions with regards potential placements. There are also legal requirements that must be met by employers including insurance and health and safety procedures; the Work Placement Co-ordinator will visit employers to ensure that the required information is in place. Periodically, the Work Placement Co-ordinator will check your progress with the employer.

A timetabled module on the second year of the programme will include delivery on aspects of professionalism and employability such as CV writing, Codes of Conduct, relevant legislation and interview techniques. In addition to these activities you are expected to maintain a digital log of your placement which will log hours, reflect upon the skills and techniques you have

applied, how they relate to the course content and also planning for future graduate employment.

The tutorial sessions towards the end of the first year will provide you with more information in order to prepare you to seek out your placements as sometimes these can be completed in the summer break. Also, some placements may require DSB checks and staff can aid you with the completion of the required forms.

If you have difficulty securing a work placement, the Work Placement Co-ordinator maintains contacts with local employers and will work with you to be placed. If a placement cannot be located, a live employer related project will be undertaken for the required hours. It should be noted however that students who have shown the initiative in securing placements in areas of their interest have gone on to be successfully employed graduates with these and similar organisations.