Schedule of courses

Compulsory Courses

L5

D101 Programming Fundamentals
D111 Database Fundamentals
I101 Information Systems Fundamentals
I102 Technical Support Fundamentals
I111 Web Fundamentals
I121 Systems Analysis Fundamentals
T101 Network Fundamentals
T111 Computer Hardware Fundamentals

L7

I301 Professional Practice
I302 Industry Project

Elective Courses

L6

I202 IT Project Management
D201 Advanced Programming
D202 Software Process
D211 Database Development
I201 Ethics in Digital Technologies
I203 Digital Multimedia
I213 Dynamic Web Solutions
I221 Analysis and Design
T201 Network Services
T206 Networks (CISCO SRWE)
T211 Systems Security
I212 Enterprise Data Management
D212 Machine Learning Foundation

L7

D301 Software Engineering
D303 Mobile Application Development
D311 Advanced Database Concepts
I303 Management of Information and Communication Technology
T301 Network Design
T302 Network Scaling (Cisco ENSA)
T303 Ethical Hacking
T311 Systems Administration
T312 Network Security
I304 Data Analytics and Intelligence
I311 Advanced Web Solutions
D312 Advanced Machine Learning

D101 Programming Fundamentals	
Course Level	5
Credits	15
Pre-requisite	none
Co-requisite	none

Course Aim

To provide an introduction to the fundamentals of programming and to enable students to develop quality software.

Learning Outcomes

On successful completion of this course students will be able to:

1. Develop an application using an industry standard language
2. Debug, test and document a software application
3. Explain the fundamentals of programming

Content

- History of software development
- Phases of software development lifecycle (SDLC)
- Concepts of problem solving and abstraction
- Design concepts
- Programming concepts: control structures, expressions, use of APIs, data types, classes, and inheritance
- Debugging and exception handling
- Testing: black box and white box

D111 Database Fundamentals	
Course Level	5
Credits	15
Pre-requisite	none
Co-requisite	none

Course Aim

To provide students with a broad operational knowledge of database design and administration.

Learning Outcomes

On successful completion of this course students will be able to:

1. Design a relational database to meet organisational requirements
2. Apply interaction design concepts to a user interface
3. Store and retrieve organisational data using query and reporting tools
4. Explain database design and administration

Content

- Data organisation approaches
  Examples may include: data types, tables, keys, relationships
- Entity Relationship Diagrams
- Common Database models
  Examples may include: (distributed, centralised) hierarchical, network, relational, object-oriented

- Concepts of Data Manipulation Language (DML), Data Definition Language (DDL), and Data Control Language (DCL)
- Data Integrity
  Examples may include: entity integrity, domain integrity, referential integrity

I101 Information System Fundamentals	
Course Level	5
Credits	15
Pre-requisite	none
Co-requisite	none

Course Aim

To introduce students to business systems and essential components of the ICT profession.

Learning Outcomes

At the successful completion of this course students will be able to:

1. Describe information systems principles, roles and functional business areas
2. Communicate effectively and professionally using industry standard tools
3. Apply and explain professional, legal, and ethical principles relevant to the ICT industry

Content

- Organisational entities and structures including communication processes and mediums
- Consumer law, privacy law, relevant computing legislation, ethical considerations, Treaty of Waitangi
- Collaborative document editing, virtual team organisation
- Information systems and IT roles
- APA referencing

I102 Technical Support Fundamentals	
Course Level	5
Credits	15
Pre-requisite	none
Co-requisite	none

Course Aim

To enable students to deliver organisational technical support based on best practice in IT Service Management

Learning Outcomes

At the completion of this course students will be able to:

1. Apply a user needs analysis to identify organisational requirements
2. Create, deliver and evaluate a training session
3. Develop technical documentation to a professional standard
4. Explain IT service management best practice

Content

- Adult learning concepts
- Learning preferences
- Training styles and methods
- User needs analysis
- Resources and tools for training
- Technical documentation
- Lesson planning
- User support services and roles
- ITIL Service Operation

I111 Web Fundamentals	
Course Level	5
Credits	15
Pre-requisite	none
Co-requisite	none

Course Aim

To provide an introduction to the fundamentals of web development and to enable students to produce quality websites.

Learning Outcomes

At the successful completion of this course students will be able to:

1. Design a website according to UX design principles that meets organisational requirements
2. Develop a website using an industry standard approach
3. Explain the fundamentals of website development

Content

- History of the Internet
- Principles of Web design
- Internet protocols
  Examples may include: TCP/IP, HTTP, FTP, SMTP
- Web development techniques
  Examples may include: HTML, XHTML, DHTML, XML, JavaScript, CSS, server-side scripting

I121 Systems Analysis Fundamentals	
Course Level	5
Credits	15
Pre-requisite	none
Co-requisite	none

Course Aim

To provide an introduction to the principles of systems analysis and systems requirements elicitation techniques

Learning Outcomes

At the successful completion of this course students will be able to:

1. Analyse situations requiring problem solving
2. Elicit and model user requirements using a variety of techniques
3. Construct accurate systems analysis documentation reflecting requirements

Content

- Problem analysis techniques
  Examples may include: user interviews, observation, problem definition
- Requirements elicitation techniques
  Examples may include: user interviews, observation, surveys, prototyping, walkthroughs
- Requirements Modelling
  Examples may include: user stories, use-case diagrams
- Systems analysis phases of Systems Development Lifecycle
- Modelling principles
  Examples may include: abstraction, decomposition, user views, explicitness (eg, state all assumptions or make no assumptions)
- Data Modelling
- Process Modelling

T101 Network Fundamentals	
Course Level	5
Credits	15
Pre-requisite	none
Co-requisite	none

Course Aim

To provide an introduction to the fundamentals of computer networks as they currently exist in industry and to enable students to configure, test and troubleshoot local area networks.

Learning Outcomes

On successful completion of this course students will be able to:

1. Describe the operation of current network technologies
2. Select the most appropriate network technologies for a given scenario
3. Apply testing and troubleshooting techniques to networking problems

Content

- Computer network classification: LAN, MAN, WAN and PAN.
- LAN copper, wireless and fibre media; their characteristics and usage.
- Ethernet hardware, performance and operation.
- IP addressing and operation.
- TCP operation, performance and uses.
- UDP operation, performance and uses.
- Symmetric and asymmetric key encryption characteristics and usage.
- Authentication and hashing.
- Network configuration of operating systems in current use.

T111 Computer Hardware Fundamentals	
Course Level	5
Credits	15
Pre-requisite	none
Co-requisite	none

Course Aim
To develop students' understanding of the fundamentals of computer hardware, operating systems and troubleshooting techniques.

Learning Outcomes
On successful completion of this course students will be able to:

1. Describe the purpose and operation of major computer components
2. Demonstrate use of a command line interface (CLI)
3. Select, install, troubleshoot and configure IT hardware and systems software

Content

- Numbering systems and data representation used in computer systems
- Computer hardware and operating system fundamentals
- Troubleshooting tools and techniques relating to hardware and operating systems
- File Systems
- Memory Management
- Concurrency

D211 Database Development	
Course Level	6
Credits	15
Pre-requisite	D101
Co-requisite	none
Mandatory for Major:	Software Engineering, Data Management & Analytics, Web & Mobile Development, Systems Administration

Course Aim

To effectively design an information system for a complex business application.

Learning Outcomes

At the successful completion of this course students will be able to:

1. Evaluate alternative design solutions
2. Design a complex information system
3. Create a prototype from a design
4. Formulate quality processes

Content

- Normalisation and De-normalisation
- Conceptual, Logical, and Physical diagrams
- Client/Server Architecture
- Prototyping approaches
- Distributed Database design
- Input/Output design

I202 IT Project Management	
Course Level	6
Credits	15
Pre-requisite	I102
Co-requisite	none
Mandatory for Major:	Project Management

Course Aim

This course will enable the student to learn the basic principles and terminology of the profession of project management, and apply this to create project plans. Students will also be given a brief introduction to using project management software.

Learning Outcomes

At the completion of this course students will be able to:

1. Examine, discuss and apply the knowledge areas of project management.
2. Develop a project plan for an IT related project.
3. Use project management software to create a Gantt chart for scheduled activities and assigned resources, including people, equipment and their relevant costs.
4. Use project management software to analyse project data and produce reports.

Content

- Knowledge areas of Project Management including; Integration, Scope, Time, Cost, Quality, Resources, Stakeholders, Communications, Risk, and Procurement
- Project Management terminology
- Project planning
- Project management software

I221 Analysis and Design	
Course Level	6
Credits	15
Pre-requisite	I121
Co-requisite	none
Mandatory for Major:	Business & Systems Analysis

Course Aim

This course will enable students to analyse the requirements for an information system and evaluate different methodologies used in systems analysis.

Learning Outcomes

At the successful completion of this course students will be able to:

1. Create analysis documentation for a moderately complex system
2. Create design documentation for the system under investigation
3. Implement quality processes to ensure accuracy of analysis and design documentation

Content

- Analysis methodologies
- Requirements Management
- Data and Process modelling
- Quality processes

D201 Advanced Programming	
Course Level	6
Credits	15
Pre-requisite	D101
Co-requisite	none
Mandatory for Major:	Software Engineering, Data Management & Analytics

Course Aim

To introduce standard algorithms required for business application programming

Learning Outcomes

At the successful completion of this course students will be able to:

1. Design and Construct small applications using a variety of algorithms
2. Devise test plans to ensure quality software
3. Create system maintenance documentation

Content

- Standard algorithms
  Examples may include: Searching, Sorting, Recursion
- File input/output
- Database access
- Testing strategies
  Examples may include: white-box, black-box
- Maintenance documentation
- Web applications

D202 Software Process	
Course Level	6
Credits	15
Pre-requisite	D101
Co-requisite	none
Mandatory for Major:	Software Engineering

Course Aim

To create quality software applications utilising a modern development approach

Learning Outcomes

At the successful completion of this course students will be able to:

1. Undertake a team based iterative development project
2. Effectively manage an individual development task
3. Implement processes to ensure quality
4. Compare and select an appropriate development method for a given problem

Content

- Iterative development approaches
  Examples may include: RAD, Agile

  Team based development approaches

- Quality Assurance techniques
  Examples may include: Testing, Inspection and Review, Maintenance documentation, User documentation

  Adapting to user requirements changes

I201 Ethics in Digital Technology	
Course Level	6
Credits	15
Pre-requisite	I101
Co-requisite	none
Mandatory for Major:	Cybersecurity

Course Aim

To enable learners with the ability to critically research and analyse ethical issues in the use and development of digital technologies.

Learning Outcomes

At the successful completion of this course students will be able to:

1. Identify and analyse ethical issues related to digital technologies
2. Critically evaluate ethical theories and ICT Codes of ethics, and apply to ethical problems
3. Apply professional skills to determine and present solutions to a current ethical problem in digital technology

Content

- Critical thinking
- Professional skills
- Ethical theories,
- Privacy,
- Security
- Cybercrime
- Intellectual property,
- Freedom of speech and regulation of the internet
- Legislation related to course content, big data
- Social and ethical issues related to emerging technologies,

Piracy

D212 Machine Learning Foundation	
Course Level	6
Credits	15
Pre-requisite	D101; D111
Co-requisite	None
Mandatory for Major:	None

Course Aim

This course introduces students to the foundational mathematics and practical tools of machine learning. Learners will build mathematical understanding and apply it to train, evaluate, and deploy Machine Learning models

Learning Outcomes

At the successful completion of this course students will be able to:

1. Apply fundamental mathematical and statistical concepts to basic machine learning problems
2. Develop, optimise, and evaluate supervised and unsupervised learning models using appropriate methods and techniques, interpreting trade-offs between complexity and generalisation , and communicate results effectively.
3. Plan, implement, and communicate a complete machine learning project, including feature engineering, model development, ethical considerations, and professional presentation of results.

Content

- Mathematical and Theoretical Foundations
- Supervised Learning Algorithms
- Unsupervised Learning & Feature Representation
- Neural Networks & Optimisation
- Responsible and Ethical Machine Learning

I203 Digital Multimedia	
Course Level	6
Credits	15
Pre-requisite	I101
Co-requisite	none
Mandatory for Major:	Web & Mobile Development

Course Aim

To apply principles and techniques relating to the application of digital multimedia technologies

Learning Outcomes

At the successful completion of this course students will be able to:

1. Describe the concepts of digital images, video and audio
2. Create and manipulate digital image, video and audio files according to a technical specification for distribution across the ICT infrastructure
3. Optimise digital multimedia for commonly used ICT mediums

Content

- Digital Images
  Examples may include: Editing, 2D, 3D, Raster type, Vector type, Lossy and Lossless compression, Resolution, Conversion, Common file types, Medium Optimisation
- Digital Video
  Examples may include: Editing, Recording, Frame rate, Interlacing, Resolution, Aspect Ratio, Bit rate, Compression, Codecs, Common formats, Conversion, Common file type, Medium Optimisation
  Digital Audio
  Examples may include: Editing, Recording, Sample rate, Word size, Bit rate, Dithering, Aliasing, Compression, Conversion, Common file type, Medium Optimisation

I213 Dynamic Web Solutions	
Course Level	6
Credits	15
Pre-requisite	I111
Co-requisite	none
Mandatory for Major:	Web & Mobile Development

Course Aim

To create a dynamic web application utilising a variety of open-source technologies

Learning Outcomes

At the successful completion of this course students will be able to:

1. Design and document a web application
2. Secure critical business data within the web application
3. Interface with a web based database management system
4. Implement user security and session management

Content

- Open source web technologies
- Scripting languages
- Web Server software
- Web application security
- Data validation

T201 Network Services	
Course Level	6
Credits	15
Pre-requisite	T101
Co-requisite	none
Mandatory for Major:	Network Engineering, Cybersecurity, Systems Administration, Security

Course Aim

To implement key network services as used in modern LANs and to explain the network protocols that these services use.

Learning Outcomes

On successful completion of this course students will be able to:

1. Analyse and evaluate network services
2. Implement and configure network services
3. Analyse and diagnose faults within network services

Content

- DNS server configuration of forward and reverse resolution
- DHCP server configuration
- LDAP compliant directory service
- Web proxy implementation and automatic client configuration
  File sharing with SMB

T206 Network (Cisco SWRE)	
Course Level	6
Credits	15
Pre-requisite	T101
Co-requisite	none
Mandatory for Major:	Network Engineering, Security

Course Aim

To enable students to gain practical and technical networking knowledge that will allow them to configure and troubleshoot routers, switches and resolve common issues with networks.

Learning Outcomes

On successful completion of this course students will be able to:

1. Describe basic switching concepts and the operation of CISCO switches
2. Describe the purpose, nature, and operations of a router, routing tables, and the route lookup process
3. Describe how VLANs create logically separate networks and how routing occurs between them
4. Configure and troubleshoot static routing

Content

The CISCO Network Academy (CNA) Routing and Switching Essentials curriculum:

- Introduction to Switched Networks
- Basic Switching Concepts and Configuration
- VLANs
- Routing Concepts
- Inter-VLAN Routing
- Static Routing
- DHCP
- STP
- EtherChannel
- FHRP
- WLAN concepts

T211 Systems Security	
Course Level	6
Credits	15
Pre-requisite	T111
Co-requisite	none
Mandatory for Major:	Network Engineering, Cybersecurity, Systems Administration, Security

Course Aim

To analyse and implement computer systems security, including operating systems, server applications and networks; and to enable students to explain the fundamentals of computer forensics.

Learning Outcomes

On successful completion of this course students will be able to:

1. Analyse and evaluate the security of IT systems
2. Implement and configure the security of IT systems
3. Diagnose IT systems security and mitigate weaknesses

Content

- Operating systems securityFirewalls and content filtering
- Virtual Private Networks (VPNs)
- Tunnelling
- Operating Systems Security
- Networking devices and protocols
- Encryption and Authentication

I212 Enterprise Data Management	
Course Level	6
Credits	15
Pre-requisite	I101 & I111
Co-requisite	none
Mandatory for Major:	Data Management & Analytics

Course Aim

To enable students to design and implement enterprise data management systems.

Learning Outcomes

On successful completion of this paper students will be able to:

1. Compare and select appropriate enterprise data management systems
2. Design an enterprise data management system structure
3. Implement an enterprise data management system including automated processes

Content

This paper will cover the following:

- Content Management Systems
- Document Management Systems
- Business Intelligence Systems
- Cloud-based platforms

I301 Professional Practice	
Course Level	7
Credits	15
Pre-requisite	240 Credits including all Level 5 and 6 compulsory courses
Co-requisite	none
Mandatory for Major:	All

Course Aim

To prepare students for an industry project/internship related to their area of study.

Learning Outcomes

On successful completion of this course, students will be able to:

1. Demonstrate the work-place skills and attributes required to obtain a role in a New Zealand business.
2. Identify and critically analyse business-related processes and issues relating to an organisation and apply theoretical knowledge to processes or problems.
3. Develop and present a proposal for a project on a specific organisational issue.

Content

- Organisational communication
- Curriculum Vitae preparation
- Interview skills
- Client management
- Presentation skills
- Team roles and managing teams
- Industry project overview and project sourcing
- Ethics and professional conduct

Employment and remuneration

I302 Industry Project	
Course Level	7
Credits	45
Pre-requisite	280 credits including all compulsory level 5, 6 and 7 courses
Co-requisite	none
Mandatory for Major:	All

Course Aim

To enable students to undertake an industry based project of a complex nature.

Learning Outcomes

At the completion of this course students will be able to:

1. Manage an ICT project for industry
2. Produce original work and project deliverables
3. Consider and apply professional work ethics
4. Meet project timelines and goals
5. Record and evaluate project work and progress
6. Present project outcomes to sponsors and academic supervisors

Content

- Project documentation including terms of reference for project
- Industry based work which integrates skills and knowledge gained throughout the degree and of a suitably complex level
- Written report on project outcomes
- Formal presentations

D301 Software Engineering	
Course Level	7
Credits	15
Pre-requisite	D201 or D202
Co-requisite	none
Mandatory for Major:	Software Engineering

Course Aim

To design and construct quality software ready for distribution

Learning Outcomes

At the successful completion of this course students will be able to:

1. Work in a team to deliver a software product
2. Conduct effective and efficient inspections
3. Evaluate software user interfaces for accessibility and usability
4. Design and implement testing to ensure a quality product

Content

- Software engineering and its place as an engineering discipline
- Software reuse: Frameworks and APIs
- Human-Computer interaction
- User-Interface evaluation techniques:
  Examples may include: heuristic, cognitive walkthroughs
- Task Analysis. User-centred design
- Securing applications
- Testing strategies
  Examples may include: unit testing, integration testing, profiling, test driven development

Problem / defect reporting and tracking

D303 Mobile Application Development	
Course Level	7
Credits	15
Pre-requisite	D101
Co-requisite	none
Mandatory for Major:	Software Engineering, Web & Mobile Development

Course Aim

To develop mobile applications for current and emerging mobile computing devices using industry standard tools and frameworks

Learning Outcomes

At the successful completion of this course students will be able to:

1. Design and develop mobile applications in a major mobile platform
2. Apply current software technologies, framework architecture and standards used in mobile application development
3. Securely transfer local data to a remote real-time database

Content

- Mobile app design
- Developing apps for Android or other mobile operating systems
- Local Data storage on mobile devices
- Mobile Frameworks
- Mobile Design Patterns

Web services

D311 Advanced Database Concepts	
Course Level	7
Credits	15
Pre-requisite	D211
Co-requisite	none
Mandatory for Major:	Data Management & Analytics, Systems Administration

Course Aim

To enable students to successfully design, create and administer a data warehouse using a server-based database management system.

Learning Outcomes

At the successful completion of this course students will be able to:

1. Discuss and argue an advanced database topic
2. Install a server-based database management system
3. Design and create a data warehouse schema
4. Transfer and transform data from more than one data source into a data warehouse
5. Analyse and process data for management reporting
6. View pre-processed information from the data warehouse from a separate application

Content

- Overview of data warehousing
- Installing and securing a server-based database management system
- The data warehouse schema
  Examples include: fact tables, dimensions tables, star schemas, snowflake schemas

- Data transfer and transformation with Data Transfer Services

Data analysis and processing with Analysis Services

D312 Advanced Machine Learning	
Course Level	7
Credits	15
Pre-requisite	D212
Co-requisite	none
Mandatory for Major:	none

Course Aim

To enable students to build, deploy, and explain complex Machine Learning systems using real-world datasets and production tools.

Learning Outcomes

At the successful completion of this course students will be able to:

1. Demonstrate critical understanding of advanced deep learning architectures and evaluate their strengths, limitations, and trade-offs , and communicate results effectively.
2. Design, adapt, and evaluate generative AI and large-scale models to address complex and multimodal problems, and communicate findings effectively.
3. Deploy and monitor AI systems in a containerised or cloud environment, and communicate outcomes effectively.

Content

- Advanced Deep Learning and Model Optimisation
- Generative and Large-Scale AI Applications
- Explainable and Responsible AI
- Deployment, Automation and Cloud Integration
- Professional practice

I303 Management of ICT	
Course Level	7
Credits	15
Pre-requisite	none
Co-requisite	none
Mandatory for Major:	Project Management

Course Aim

To provide students with the skills and knowledge to analyse organisations and make management decisions relating to the organisation's IT.

Learning Outcomes

At the completion of this course students will be able to:

1. Discuss and analyse practices associated with managing and structuring ICT services within an organisation
2. Recommend and design a service continuity plan for an organisation
3. Apply best practice human resource management techniques
4. Develop and recommend strategies and plans to improve an organisation's IT service

Content

- IT Service Management best practice and frameworks
- Workforce Management Incident Management
- Service Desk
- Information Security Management
- Service Continuity Management
- Strategy Management
- Contemporary and emergent technologies

T301 Network Design	
Course Level	7
Credits	15
Pre-requisite	T201
Co-requisite	none
Mandatory for Major:	Network Engineering, Cybersecurity

Course Aim

To recommend network and service architectures and to design and implement, or simulate chosen architectures. Students will be able to analyse and evaluate network designs, select an appropriate technology and design for a given situation, and justify their selection.

Learning Outcomes

On successful completion of this course students will be able to:

1. Assess and recommend appropriate network hardware and configuration/s for given scenario/s
2. Assess, evaluate and recommend the deployment of virtualisation/cloud/containerised infrastructure
3. Assess and respond to infrastructure requirement change/s
4. Implement network/virtualisation/cloud/containerised infrastructure for given scenario/s

Content

- Automated network and service provisioning and management
- Installation and configuration of thick and thin client technologies
- Installation and configuration of a network simulator
- Installation and configuration of virtualised infrastructure
- Configuration of cloud infrastructure
- Business continuity planning
- Network design and documentation

T303 Ethical Hacking	
Course Level	7
Credits	15
Pre-requisite	T211
Co-requisite	none
Mandatory for Major:	Cybersecurity

Course Aim

To provide students with the ability to identify, analyse and mitigate security vulnerabilities in computer systems and networks, following appropriate legal and ethical practices.

Learning Outcomes

On successful completion of this course students will be able to:

1. Identify and apply appropriate legal and ethical principles to ensure all actions comply with relevant laws and professional standards
2. Identify and apply ethical hacking techniques to identify and analyse security vulnerabilities within given scenarios
3. Develop effective processes and strategies to mitigate vulnerabilities within given scenarios.
4. Communicate technical findings clearly and professionally to both technical and non-technical audiences, providing actionable recommendations for enhancing security posture

Content

- Ethics and legislation
- Open source intelligence
- Reconnaissance
- Vulnerability assessment
- Penetration methodologies and testing
- Denial of service
- Social engineering
- Lateral movement
- Imbedded hardware security
- Software security
- Network security
- Cloud security
- Security vulnerability mitigation

Documentation and presentation

T302 Network Scaling (Cisco ENSA)	
Course Level	7
Credits	15
Pre-requisite	T206
Co-requisite	None
Mandatory for Major:	Network Engineering

Course Aim

To gain practical and technical networking knowledge that will assist in designing, building and analysing networks and their protocols using advanced technologies.

Learning Outcomes

On successful completion of this course students will be able to:

1. Configure and troubleshoot routers in a complex routed IPv4 or IPv6 network using single area OSPF
2. Describe different WAN technologies and QoS mechanisms
3. Describe the operations and benefits of virtual private networks (VPNs) and IPSec
4. Configure, and troubleshoot Access Control Lists (ACLs)
5. Configure, and troubleshoot Network Address Translation (NAT) for IPv4
6. Describe enterprise-scale network-management techniques including software-defined networking, virtualisation, monitoring and automation

Content

The CISCO Network Academy (CNA) Scaling and Connecting Networks curriculum:

- Single-Area OSPF concepts
- Single-Area OSPF configuration
- Security concepts
- ACL concepts
- ACL configuration
- Network Address Translation for IPv4
- WAN concepts
- VPN and IPSec concepts and configuration
- QoS concepts
- Network management concepts and configuration
- Network design concepts
- Network troubleshooting
- Network virtualisation

Network Automation

T311 Systems Administration	
Course Level	7
Credits	15
Pre-requisite	T211
Co-requisite	None
Mandatory for Major:	Systems Administration, Security

Course Aim

To provide the ability to design and construct a complex multi-user client/server network. Students will gain skills needed to configure and integrate complex systems.

Learning Outcomes

On successful completion of this course students will be able to:

1. Configure and administer multi-user implementation of a client/server network
2. Implement strategies that will ease administrative burden
3. Implement remote administration of central services

Content

- Client/Server configuration using current operating systems such as Windows and Linux desktop and server editions
- Automating administrative tasks such as creating users and log file checking
- Management of system policies
- Configuring various application deployment techniques
- Automating administrative tasks through scripting
- Centralised authentication of various software and operating systems

T312 Network Security	
Course Level	7
Credits	15
Pre-requisite	T206
Co-requisite	None
Mandatory for Major:	Security

Course Aim

To enable students to understand and configure the components, and operation of Virtual Private Networks, firewalls and network security.

Learning Outcomes

At the successful completion of this course students will be able to:

1. Explain the operation of Virtual Private Networks (VPNs), firewalls, router security, switch security and network security
2. Configure and troubleshoot Virtual Private Networks (VPNs)
3. Configure and troubleshoot Firewalls
4. Analyse, configure and troubleshoot router and switch security in an IP network

Content

- Virtual Private Networks
- Cisco CCNA Security
- Network security threats
- Securing network devices
- Authentication, Authorisation and Accounting (AAA)
- Firewall technologies
- Network security
- Intrusion prevention systems (IPS)
- Cryptographic Systems
- Cisco ASA
- SBA Practice

I304 Data Analysis and Intelligence	
Course Level	7
Credits	15
Pre-requisite	D211
Co-requisite	None
Mandatory for Major:	Data Management & Analytics

Course Aim

To enable students to use data analytics and business intelligence tools and techniques in order to provide decision support within an organisational context

Learning Outcomes

At the successful completion of this course students will be able to:

1. Demonstrate how data analytics techniques and tools are used to support business decision making
2. Apply data analytics tools and techniques on organisational data
3. Provide meaningful representation of organisational data

Content

- Data analytics
- Business intelligence tools
- Visual data representation
- Data exploration
- Decision support reporting
- Big data
- Power Pivot
- Power BI
- SSRS, SSIS, SSAS

I311 Advanced Web Solutions	
Course Level	7
Credits	15
Pre-requisite	I213
Co-requisite	None
Mandatory for Major:	Web & Mobile Development

Course Aim

To enable students to investigate, implement, and critique influential, new, and emerging web technology solutions

Learning Outcomes

At the successful completion of this course students will be able to:

1. Demonstrate advanced understanding of new, emerging, and influential web technologies
2. Investigate and critically present on a new or influential web technology
3. Develop systems demonstrating advanced application of new or influential web technology

Content

- Server-side languages
- Client-side languages
- Web presentation frameworks
- Development frameworks and libraries
- Everything as a service
- Data security
- Traffic Analysis Tools
- Content management systems