Programme Specification

MSc Transportation Planning and Engineering (2020-21)

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of Study	Full-time
Duration in years	1
Accreditation details	Chartered Institute of Highways & Transportation (CIHT) Chartered Institute of Logistics and Transport (CILT) Institute of Highway Engineers (IHE) Institution of Civil Engineers (ICE) Institution of Structural Engineers (IStructE)
Final award	Master of Science (MSc)
Name of Award	MSc Transportation Planning and Engineering Behaviour Infrastructure Operations
Interim Exit awards	Postgraduate Certificate Postgraduate Diploma
FHEQ level of final award	Level 7
Programme Code	8114
QAA Subject Benchmark or other external reference	Engineering 2015
Programme Lead	Simon Blainey

Programme Overview

Brief outline of the programme

As a student on the programme, you will gain a sound knowledge of the theory and concepts involved in transportation planning and engineering. You will benefit from the expertise available within our Transportation Research Group, as well as from transport professionals from external organisations who contribute to the programme.

As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our Disclaimer to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's quality handbook.

Your contact hours will vary depending on your module/option choices. Full information about contact hours is provided in individual module profiles.

Learning and teaching
Acquisition of core knowledge and understanding is through lectures, seminars, tutorials, field and laboratory classes, workshops, and independent study and research. You are encouraged from an early stage to supplement and consolidate your understanding and knowledge by independent study.

Assessment
This is through a mix of coursework, examination and dissertation. Most modules involve individual or group-based coursework to help students to become practised in the application of the theories introduced in lectures. Much of this coursework uses 'real' situations and case studies that draw together different elements of the programme. Computer modelling applications can include:

- SPSS for statistical modelling
- 'microscopic' traffic models, such as VISSIM and AIMSUN
- LINSIG for network modelling
- ARCADY for junction design
- ArcGIS for spatial modelling and mapping

Special Features of the programme

The MSc course in Transportation Planning and Engineering is characterized by high industry involvement in the planning and execution of dissertation projects, significant use of visiting lecturers and field studies. The module CENV6001 Transport Planning: Practice includes a mock public inquiry chaired by an industry expert where the students engage in debate of a realistic transport development.

The course includes a two day residential field trip, comprising museum visits, site visits, and a group challenge. Some modules include additional shorter field trips to transport-related locations in the Southampton area.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our Disclaimer to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's Quality handbook.

Educational Aims of the Programme

The aims of the programme are:

1. For you to gain a sound knowledge and understanding of the key issues and processes in transportation planning and engineering.
2. To provide relevant education and training whether you are from a developed or less developed country.
3. To provide you with a range of specialist modules integrated within the structured learning environment, reflecting the internationally-renowned research expertise within the Faculty, in order to broaden and deepen your educational experience.
4. To develop your skills in critical appraisal and analysis of transport options and systems, in independent research and in oral and written communications.
5. To train you to enable you to become a professional transportation planner/engineer who meets the requirements of the Engineering Council (i.e. UK-SPEC), and to have a broad range of knowledge and skills (including IT and communications) capable of meeting the present and future demands of industry and commerce.
6. To provide relevant in-career postgraduate training for professionals working in transportation planning and engineering
7. To provide you with a supportive and intellectually stimulating environment that encourages an attitude of independent learning and enquiry, and fosters an ethos of lifetime learning and professional development.
8. To offer you individual and group projects and assignments which are supported by the research activities within the Faculty and stimulate the individual innovation, self- assessment and teamwork skills required in engineering.

Programme Learning Outcomes

The programme provides opportunities for you to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have been developed with reference to the Accrediting Institution guidelines and the UK-SPEC Degree Output Standards General and Specific Learning Outcomes.

Knowledge and Understanding
Having successfully completed this programme you will be able to demonstrate knowledge and understanding of:

A1. The relevant scientific principles relating to transport planning and engineering. (contributes to meeting AHEP LOs SM1, SM3)
A2. Transport Governance, issues relevant to transport policy formulation, transportation planning methods, modelling techniques and practical applications (contributes to meeting AHEP LOs SM5, SM6, EA2)
A3. Transportation Engineering analysis and design, including traffic flow theory, analytical methods, transport infrastructure design and modelling. (contributes to meeting AHEP LOs SM1, SM2, EA2)
A4. Transport management applications in urban and inter-urban environments, including with use of Intelligent Transport Systems. (contributes to meeting AHEP LOs SM1, SM3, SM4, EA5, EL3, EL7)
A5. Multi-modal passenger and freight transport systems, including their characteristics, applications and evaluation. (contributes to meeting AHEP LOs SM3, SM6)
A6. Environmental issues and impacts of transport, including local and global emissions, energy consumption, noise, environmental impact assessment and environmental protection (contributes to meeting AHEP LOs SM3, SM6, D2, EL4)
A7. Transport Economics, from both theoretical and practical perspectives (contributes to meeting AHEP LOs SM2, SM5, EL7)
A8. Highway Engineering, including materials, structural design, maintenance and rehabilitation (contributes to meeting AHEP LOs SM1)
A9. Current problems and new insights in transport planning and engineering. (contributes to meeting AHEP LOs SM4, SM6, EA5, P9)
A10. Transport data analysis methods and techniques, including statistical processes (contributes to meeting AHEP LOs SM2, SM5)
A11. Design processes and methodologies and their application to address transport-related problems and challenges. (contributes to meeting AHEP LOs D5, D7)
A12. The Transportation research process, through the completion of an individual project
A13. Information and communication technology relevant to the practice of Transportation Planning and Engineering (contributes to meeting AHEP LOs SM3)
A14. Health and safety issues, risk assessment and regulatory frameworks. (contributes to meeting AHEP LOs D2, EL5, EL6, P5, P6)
A15. The need for a high level of professional and ethical conduct in the transport industry, and the social and professional responsibilities of transport planners and engineers (contributes to meeting AHEP LOs EL1)
A16. The commercial and social context within which transport systems operate. (contributes to meeting AHEP LOs SM6, D1, D2, EL2, EL7, P1)

Teaching and Learning Methods

Acquisition of core knowledge and understanding is through lectures, seminars, tutorials, field and laboratory classes, workshops, and independent study and research. You are encouraged from an early stage to supplement and consolidate your understanding and knowledge by independent study.

Assessment Methods

Testing of the knowledge base is through a combination of unseen written examinations and assessed coursework in the form of problem solving exercises, laboratory reports, design exercises, essays and individual and group projects.

Subject Specific Intellectual and Research Skills

Having successfully completed this programme you will be able to:

B1. Plan, conduct and report on an individual research programme. (contributes to meeting AHEP LOs D5)
B2. Analyse and produce transport plans, consistent with policy statements
B3. Analyse and solve engineering problems, using appropriate mathematical methods as necessary. (contributes to meeting AHEP LOs EA3, EA6, D4, P2)
B4. Be creative in the solution of problems and in design development. (contributes to meeting AHEP LOs SM1, D4)

B5. Design engineering elements and systems to meet a need, evaluate critically and make improvements. (contributes to meeting AHEP LOs EA1, EA4, D3, D4, D8)
B6. Integrate and evaluate knowledge, understanding, information and data from a variety of sources and disciplines. (contributes to meeting AHEP LOs EA4)
B7. Identify and implement statistical techniques for analysing transport data, appropriate for the analysis requirements. (contributes to meeting AHEP LOs EA3, EA6)
B8. Assess the limitations of a range of analysis tools and methods when applied in a transport context. (contributes to meeting AHEP LOs P2, P8, P9)
B9. Take a holistic approach to solving problems and designing systems, applying professional judgement to balance risks, cost, benefits, safety, reliability, aesthetics and environmental impact. (contributes to meeting AHEP LOs D2, D4, P5, P7, P10)
B10. Assess the sustainability of transport planning and engineering schemes. (contributes to meeting AHEP LOs EL4)

Teaching and Learning Methods

- Intellectual skills are developed through the teaching and learning activities.
- Analysis and problem-solving skills are further developed through regular problem sheets issued by module lecturers and through small group teaching.
- Experimental, research and design skills are further developed through coursework exercises, laboratory, and design and research projects.
- Individual feedback is provided on all work submitted.

Assessment Methods

- Analysis and problem-solving skills are assessed through unseen written examinations and problem based exercises.
- Experimental, research and design skills are assessed through laboratory reports, coursework exercises, project reports and oral presentations.

Transferable and Generic Skills
Having successfully completed this programme you will be able to:

C1. Communicate effectively – in writing, verbally and through drawings (contributes to meeting AHEP LOs D6)
C2. Apply mathematical skills – algebra, geometry, modelling and analysis. (contributes to meeting AHEP LOs P3, G1)
C3. Learn independently in familiar and unfamiliar situations with open-mindedness and in a spirit of critical enquiry.
C4. Work constructively as a member of a team. (contributes to meeting AHEP LOs P11, G1, G4)
C5. Manage time and resources.
C6. Use Information and Communications Technology in a transport context. (contributes to meeting AHEP LOs G1)
C7. Use the library, internet and other sources effectively. (contributes to meeting AHEP LOs P4)
C8. Manage tasks and solve problems, transfer techniques and solutions from one area to another, apply critical analysis and judgement. (contributes to meeting AHEP LOs D4, D7)
C9. Plan self-learning and improve performance, as the foundation for lifelong learning and CPD. (contributes to meeting AHEP LOs G2)
C10. Plan and carry out a personal programme of work, adjusting this where appropriate to reflect changing circumstances. (contributes to meeting AHEP LOs G3)
C11. Exercise initiative and personal responsibility. (contributes to meeting AHEP LOs G4)

Teaching and Learning Methods

The development of transferable skills is embedded in all modules of the programme. Typically, this takes the form of project-based work and problem-based learning.

Assessment Methods

Skills are formatively assessed through written reports and oral presentations, practical and laboratory reports. Summative assessment is through unseen examinations, extended essays and completion of a research project, including an interim progress report.

Subject Specific Practical Skills

Having successfully completed this programme you will be able to*:*

D1. Present and argue a case for or against a transport scheme (contributes to meeting AHEP LOs D1)
D2. Analyse experimental results and assess their validity.
D3. Prepare technical drawings and reports (contributes to meeting AHEP LOs D6)
D4. Give technical presentations using a variety of media. (contributes to meeting AHEP LOs D6)
D5. Use computer packages to design and evaluate different aspects and features of transport systems. (contributes to meeting AHEP LOs P2)
D6. Make effective use of scientific literature from various sources.

Teaching and Learning Methods

Practical skills are developed in experimental laboratories, computer laboratories, design exercises and research-based investigations.

Assessment Methods

Practical skills are assessed through laboratory experiment reports, coursework exercises, project reports and presentations.

Programme Structure

The programme structure table is below:

Information about pre and co-requisites is included in individual module profiles.

Where optional modules have been specified, the following is an indicative list of available optional modules, which are subject to change each academic year. Please note in some instances modules have limited spaces available.

Behaviour Pathway

Part I

The information within this Appendix is liable to change in minor ways from year to year. It is accurate at the time of writing.

The taught component of the MSc consists of five compulsory modules totalling 37.5 ECTS (75 CATS) together with two theme-specific compulsory modules and a choice of one from four options totalling 22.5 ECTS (45 CATS), giving a total of 60 ECTS (120 CATS) across two semesters.

The research component of the MSc consists of a Core module (FEEG 6012) of 30 ECTS (60 CATS) which is a research dissertation.

Optional modules are subject to change each academic year. Please note in some instances modules have limited spaces available.

Part I Compulsory modules

Code	Module Title	ECTS	Type
FEEG3004	Human Factors in Engineering	7.5	Compulsory
CENV6124	Transport Data Analysis and Techniques	7.5	Compulsory
CENV6016	Transport Economics	7.5	Compulsory
CENV6153	Transport Modelling	7.5	Compulsory
CENV6169	Transport Planning: Policy and Governance	7.5	Compulsory

CENV6001	Transport Planning: Practice	7.5	Compulsory
CENV6112	Transport, Energy and the Environment	7.5	Compulsory

Part I Core modules

Code	Module Title	ECTS	Type
FEEG6012	MSc Research Project	30	Core

Part I Optional modules

One module per pathway

Code	Module Title	ECTS	Type
CENV6171	Highway and Traffic Engineering	7.5	Optional
CENV6170	Logistics Systems Operations	7.5	Optional
CENV3065	Railway Engineering and Operations	7.5	Optional
CENV6168	Transport Management and Safety	7.5	Optional

The programme structure table is below:

Information about pre and co-requisites is included in individual module profiles.

Where optional modules have been specified, the following is an indicative list of available optional modules, which are subject to change each academic year. Please note in some instances modules have limited spaces available.

Infrastructure Pathway

Part I

The information within this Appendix is liable to change in minor ways from year to year. It is accurate at the time of writing.

The taught component of the MSc consists of five compulsory modules totalling 37.5 ECTS (75 CATS) together with two theme-specific compulsory modules and a choice of one from four options totalling 22.5 ECTS (45 CATS), giving a total of 60 ECTS (120 CATS) across two semesters.

The research component of the MSc consists of a Core module (FEEG 6012) of 30 ECTS (60 CATS) which is a research dissertation.

Optional modules are subject to change each academic year. Please note in some instances modules have limited spaces available.

Part I Compulsory modules

Code	Module Title	ECTS	Type
CENV6171	Highway and Traffic Engineering	7.5	Compulsory
CENV3065	Railway Engineering and Operations	7.5	Compulsory
CENV6124	Transport Data Analysis and Techniques	7.5	Compulsory
CENV6016	Transport Economics	7.5	Compulsory
CENV6153	Transport Modelling	7.5	Compulsory
CENV6169	Transport Planning: Policy and Governance	7.5	Compulsory
CENV6001	Transport Planning: Practice	7.5	Compulsory

Part I Core modules

Code	Module Title	ECTS	Type
FEEG6012	MSc Research Project	30	Core

Part I Optional modules

One module per pathway

Code	Module Title	ECTS	Type
FEEG3004	Human Factors in Engineering	7.5	Optional
CENV6170	Logistics Systems Operations	7.5	Optional
CENV6168	Transport Management and Safety	7.5	Optional
CENV6112	Transport, Energy and the Environment	7.5	Optional

The programme structure table is below:

Information about pre and co-requisites is included in individual module profiles.

Where optional modules have been specified, the following is an indicative list of available optional modules, which are subject to change each academic year. Please note in some instances modules have limited spaces available.

Operations Pathway

Part I

The information within this Appendix is liable to change in minor ways from year to year. It is accurate at the time of writing.

The taught component of the MSc consists of five compulsory modules totalling 37.5 ECTS (75 CATS) together with two theme-specific compulsory modules and a choice of one from four options totalling 22.5 ECTS (45 CATS), giving a total of 60 ECTS (120 CATS) across two semesters.

The research component of the MSc consists of a Core module (FEEG 6012) of 30 ECTS (60 CATS) which is a research dissertation.

Optional modules are subject to change each academic year. Please note in some instances modules have limited spaces available.

Part I Compulsory modules

Code	Module Title	ECTS	Type
CENV6170	Logistics Systems Operations	7.5	Compulsory
CENV6124	Transport Data Analysis and Techniques	7.5	Compulsory
CENV6016	Transport Economics	7.5	Compulsory
CENV6168	Transport Management and Safety	7.5	Compulsory
CENV6153	Transport Modelling	7.5	Compulsory
CENV6169	Transport Planning: Policy and Governance	7.5	Compulsory
CENV6001	Transport Planning: Practice	7.5	Compulsory

Part I Core modules

Code	Module Title	ECTS	Type
FEEG6012	MSc Research Project	30	Core

Part I Optional modules

One module per pathway

Code	Module Title	ECTS	Type
CENV6171	Highway and Traffic Engineering	7.5	Optional
FEEG3004	Human Factors in Engineering	7.5	Optional
CENV3065	Railway Engineering and Operations	7.5	Optional
CENV6112	Transport, Energy and the Environment	7.5	Optional

Progression Requirements

The programme follows the University's regulations for ***Progression, Determination and Classification of Results : Undergraduate and Integrated Masters Programmes*** or ***Progression, Determination and Classification of Results: Postgraduate Master's Programmes***. Any exemptions or variations to the University regulations, approved by AQSC are located in ***section VI of the University Calendar***.

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.
- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling. Support includes daily Drop In at Highfield campus at 13.00 – 15.00 (Monday, Wednesday and Friday out of term-time) or via on-line chat on weekdays from 14.00 – 16.00. Arrangements can also be made for meetings via Skype.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia)
- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Career and Employability services, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV.
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls and in the local community (18.00-08.00).
- A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

T

he Students' Union provides

- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline.

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

· Library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources. There is a wide range of online training and workshops available to support writing, study skills, IT and maths. The Academic skills hub holds several workshops every week day to support students.

· High speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations. Students can also access SVE (Southampton Virtual Environment), a virtual Windows University of Southampton desktop that can be accessed from personal devices such as PCs, Macs, tablets and smartphones from any location.

· Computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources).

· Standard ICT tools such as Email, secure filestore and calendars.

· Access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.

· Central IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.

· Enabling Services offering assessment and support (including specialist IT support) facilities if you have a disability, dyslexia, mental health issue or specific learning difficulties.

· The Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards.

· Career and Employability services, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV.

· A range of personal support services: mentoring, counselling, residence support service, chaplaincy, health service.

· A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides

· An academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.

· Opportunities for extracurricular activities and volunteering.

· An Advice Centre offering free and confidential advice including support if you need to make an academic appeal.

· Support for student peer-to-peer groups, such as Nightline.

In the School of Engineering and your Discipline you will be able to access:

· Student handbook for Civil Engineering students.

· Introductory sessions for all years of the programme.

· Library information retrieval seminar.

· Workshop training.

· Engineering Development and Manufacturing Centre (EDMC) equipped with a range of workshop equipment, CAD/CAM.

· Engineering specific software.

· Personal academic tutors to assist you with personal problems and to advise on academic issues (contact maintained during periods of studying abroad). A Senior Tutor is also available should you need additional

support.

· Access to academic staff through an open door policy as well as timetabled tutor meetings, appointment system and e-mail.

· Research seminars and invited lectures.

· School Student Office for the administration of your programme.

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:

- Completing student evaluation questionnaires for each module of the programme.
- Acting as a student representative on various committees, e.g. Staff/Student Liaison Committees, School Programmes Committee OR providing comments to your student representative to feedback on your behalf.
- Serving as a student representative on Faculty Scrutiny Groups for programme validation.
- Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Scrutiny Group.

Further details on the University's quality assurance processes are given in the ***Quality handbook***.

Career Opportunities

Student graduating from our MSc degrees obtain employment as graduate engineers with many leading employers in the civil engineering industry, both consultants and contractors and also regulatory authorities and local authorities. Support is available to develop their CVs and interview skills. In addition to careers in civil engineering, the transferrable skills that our students obtain make them attractive to a wide range of graduate recruiters, from financial services through to IT and management consultancy.

External Examiner(s) for the programme

Name: Professor Iain Docherty - University of Glasgow

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff: Student Liaison Committee in the first instance, and Student representatives on Staff: Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their Personal Academic Tutor in the first instance.

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook.

Appendix 1:

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme also have to pay for:

Additional Costs

Type	Details

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at ***www.calendar.soton.ac.uk***.