

PROGRAMME SPECIFICATION



1 Awarding Institution	Newcastle University
2 Teaching Institution	Newcastle University
3 Final Award	MSc
4 Programme Title	Master of Science in Rail Freight and Logistics
5 UCAS/ Programme Code	5207F MSc in Rail Freight and Logistics
6 Programme Accreditation	NA
7 QAA Subject Benchmark(s)	Engineering: Annex B4, MEng degrees, Jan 2010 (www.qaa.ac.uk) Applicability of Output Standards to Masters degrees other than the integrated MEng, Nov 2011 (http://www.engc.org.uk/professional-registration/standards/uk-spec)
8 FHEQ Level	7
9 Date written/revised	February 2014

10 Programme Aims

The programme aim is to develop the student's ability to initiate and carry out advanced performance systems analysis, and research projects to solve managerial and engineering-related problems in rail freight and logistics. Specifically, the programme aims to equip graduates with the skills and qualifications necessary to pursue a management and/or engineering career in rail freight and logistics.

The programme places an emphasis on the growing interest in rail freight services and the international aspect of logistics, as both of these promote a more mature distribution of freight. Alongside this, freight transport planners and managers will be provided with the chance to view rail freight and logistics together, from a wider perspective, allowing them to appreciate the increasing importance of rail freight and logistics policy and practices both national and international for a sustainable future.

Further to the above the programme aims to:

- prepare the students to engage in life-long learning and critical enquiry with skills in research and knowledge acquisition and an appreciation of the value of education to the wider community.
- provide the students with internationally recognised qualifications which meet the requirements of the Framework for Higher Education Qualifications at Level 7 and of other benchmark statements for applicability of output standards to Master Degrees.
- provide the rail & logistics industry in the UK, Europe and elsewhere, with

employable and enterprising graduates prepared for the assumption of managerial, operational, commercial technical, and financial responsibilities.

The programme also aims to achieve the above in the context of the Mechanical and Systems Engineering School, SAgE Faculty and Newcastle University business plans and sustainability agenda, following the University's policies, practices and procedures and conforming to the relevant sections of the QAA Code of Practice.

11 Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

1. Railway Engineering;
2. Rail Freight Operations and Management;
3. Freight Transport Logistics;
4. Rail Transport Policy, Safety and Security.
5. Rail Management, Economics and Planning;
6. Inter/Multi Modal Freight Transport;
7. Economic and Environmental Appraisal of Transport Activities;

The learning outcome from the programme is a sound understanding of rail management, engineering and logistics concepts, operations, economics, technologies, policies and practice with a focus on effective freight distributions.

Knowledge and Understanding

On completion of the programme students should be able to demonstrate:

- A1 An advanced knowledge of a broad range of analytical and simulation modelling methodologies and underlying transportation science, commonly used in the development and analysis of rail systems management, operations, engineering, theory, policy and practice; freight distributions in particular.
- A2 Knowledge of fundamental rail freight & logistics systems design issues relevant to transport management and engineering, and an understanding of how to formulate solutions, analyse and improve systems design in various managerial, operational and engineering contexts.
- A3 Working knowledge of a range of practical and theoretical methods and tools used in the development and analysis of rail & logistics systems management, operations and engineering as well as economics.
- A4 In-depth knowledge of one or more of the following (depending of selection of option modules and project area): specific rail freight logistics systems, design methods, evaluation methods, analytical and/or simulation modelling techniques, qualitative and quantitative analysis.
- A5 Knowledge of basic research and development principles and practices relevant to the mainstream rail & logistics industry.
- A6 Knowledge of key professional, safety, security, environmental and ethical issues arising in the modern rail freight and logistics industry.

A7 Knowledge of time-management, evaluation and work planning issues related to the organisation, implementation and successful completion (including reporting) of an individual Masters level, railway, freight and logistics-based project and guided independent studies.

Teaching and Learning Methods

The main mechanism for imparting the above knowledge and understanding in A1-A7 is scheduled teaching activities (e.g. lectures, practicals and fieldwork) combined with guided independent studies.

Specifically, analytical, optimization and even-based simulation modelling (e.g. Xpress MP, ARENA, SIMUL'8) are used for outcomes A1, A3, A4 and A7. Learning outcomes in A2 and A7 are mainly achieved via fieldwork, practicals and research-based teaching. Learning outcome A6 is achieved via a combination of lectures, small group teaching and student-led group activities.

Students are required to support and reinforce lecture-based knowledge transfer through guided independent studies making use of recommended sources, references, scientific papers and web-based material. Small group teaching activities allow lecture material to be discussed and supplemented and hence gain knowledge and understanding via group discussions, which provide a mechanism for detailed feedback to the students on an understanding of the specific rail logistics-related problems in their independent studies.

Technical visits associated with fieldwork are also included in the programme for students to develop an understanding of the complexity of the rail logistics system.

The major project provides the student with the opportunity to develop knowledge and understanding in a rail area of interest to a greater depth, and further reinforces material from the taught component of the programme.

Assessment Strategy

The assessment strategy of student progress includes extended activities to apply taught material during small group teaching activities and student independent studies in the form of oral presentations, written examinations and written individual and team research reports.

Specifically, summative means of assessing knowledge and understanding is a combination of class tests, oral presentations and written examinations as well as guided studies to allow students to specify a solution for a selected rail logistics problem.

Note that assessment strategy varies as appropriate to each module. The module Rail Major Project, for example, is assessed by a final report (12 000 words), four oral presentations throughout the module, and student participation for a module workshop.

Intellectual Skills	
On completion of the programme students should be able to:	
B1	Identify, adapt and develop concepts, strategies and models appropriate to the study of a wide-range of railway, freight and logistics systems, operational processes, technologies, policies and practices.
B2	Apply standard scientific principles to develop managerial, operational, engineering, economical solutions to a range of practical problems related to railway, freight and logistics systems.
B3	Select and apply appropriate analytical, optimisation, simulation, evaluation, qualitative and/or quantitative methods for analysing relevant problems, and to critically assess and interpret results obtained from these methods.
B4	Propose, formulate and present suitable methodologies to tackle typical railway, freight and logistics managerial and engineering orientated problems.
B5	Undertake an independent literature review on a specific railway, freight and logistics-related topic.
B6	Produce a clear and detailed written report of research work on railway, freight and logistics-related topic.
Teaching and Learning Methods	
Skills B1-B4 are developed through a range of scheduled learning and teaching activities such as: lectures and small group teaching, as well as fieldwork. These skills are reinforced by guided independent studies, seminars and technical visits. Therefore regular student attendance and participation at all formal scheduled learning and teaching activities is expected and required. The rail major project contributes to the development of skills B1-B6, where skills B5 - B6 are crucial for the preparation and successful completion of the project.	
Assessment Strategy	
Satisfactory acquisition of skills B1-B4 is formally assessed through independent studies (written solutions to set problems, reports and execution of practical) and written examinations and oral presentations. Class tests, team/individual presentations and individual assignments provide an important mechanism for monitoring student development through the programme. Written examinations and oral presentations test both skill acquisition and the student ability to apply such skills under time constraints imposed by the programme. Skills B5-B6 are generally assessed by work on independent studies and rail major project.	
Practical Skills	
On completion of the programme students should be able to:	
C1	Interpret and critically assess existing theories, policies, practice, models,

methods, operational patterns, production schemes and results, both qualitatively and quantitatively, within the transportation science framework in the context of railway, freight and logistics systems analysis and design, organization and management.

C2 Recognise and appreciate the problems inherent in railway, freight and logistics systems management, engineering and/or operations, and demonstrate the ability to synthesise, and propose evaluation methods for analysing railway, freight logistics systems performance, alternative solution strategies and policies for improvements to the current scenarios.

C3 Develop and construct a rational argument for solutions to a typical railway, freight, logistics management and engineering problem and deliver a logical presentation of results from independent studies.

Teaching and Learning Methods

The development of skills C1-C3 takes place throughout the entire degree programme. Specifically independent studies, team and independent assignments and rail major project are of prime importance for these skills.

Presentation and discussion of case studies during small group teaching activates also facilitate skills C1-C3 throughout the programme.

Supervision of design/creative projects is structured in a way to help students develop skills C1-C3 during the preparation of students' design/creative projects.

Students are strongly encouraged to adopt a critical thinking and logical approach when interpreting the methods, concepts and ideas presented and discussed in the entire degree programme.

In the degree programme, special emphasis is placed on the requirement of submitting outcomes of good quality from team and individual assignments that exhibit clear and logical presentation in which the research methods employed are rationally explained. Therefore the planning, organisation and execution of team and individual assignments undertaken during the degree programme play an important role in the development of skills C1-C3, have a positive impact on career development and professional growth.

Assessment Strategy

Assessment of skills C1-C3 is made by assessing students' performance on both submitted team and individual assignments and rail major project.

The team and individual assignments, including problem-solving exercises, small research project and desk-top study reports and are mainly assessed through written examinations and oral presentations.

The rail major project is assessed through the written report, four oral presentations and workshop assignment. A formal feedback from the project supervisor is also required.

Transferable/Key Skills

On completion of the programme students should be able to:

- D1 Communicate ideas clearly by both written documentation and oral presentations.
- D2 Effectively utilise modern information resources and communication technologies (ICTs).
- D3 Prioritise, organise and schedule independent studies and other organisational activities effectively.
- D4 Work independently or in a team environment to produce an outcome of good quality.
- D5 Demonstrate generic problem-solving skills.

Teaching and Learning Methods

Skills D1-D5 are incorporated in the taught component of the degree programme, serving as preparation for the development of design/creative project and rail major project.

The module *Rail Systems and Research Skills* aims to develop the student's ability to pursue self-directed railway, freight and logistics-related studies and therefore facilitates skills D1-D5 by raising the student's confidence in: preparing and delivering presentations of methodologies; using library and other information resources and planning and managing independent studies effectively.

Throughout the degree programme students undertake independent studies and student-led group activities to identify solutions to rail freight logistics-related problems and hence develop skills D4-D5.

Students who are not native speakers of English usually receive additional instructions to develop skill D1.

Due to its nature, the rail major project is a combination of research activities and involves literature reviews, communication of ideas, utilisation of ICT, time-management, and the like and hence facilitates the development of skills D1 – D5.

Assessment Strategy

Skills D1-D5 are generally assessed through independent studies, reports, team and independent assignments, seminars and workshop assignments as well as oral presentations.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The degree programme is block taught.

The degree programme includes a taught component and a rail major project, totalling 180 credits.

The taught component of the programme consists of a total credit value of 100 (1 credit is equal 10 study hours, including timetabled contact hours, team assignments, individual studies, small group teaching, student-led activities, fieldwork, practicals and workshop assignments) studied during Semesters 1 and 2 (Mid-September to June).

The 80 credit rail major project will be developed throughout the degree programme and submitted in the end of Semester 3 (note that Semester 3 spans June – September), meaning work on major project continues throughout the year. Rail major project must be submitted for assessment early September, followed by oral presentations.

The programme is available for study in full-time mode only for the time being. The period of study for full-time mode shall be one year starting in Mid-September.

All candidates, as a prerequisite for admission, fill in a short questionnaire and engage in guided pre-reading for the programme, which will give the DPD an indication of candidates' knowledge, educational background, goals, aspirations, expectations and understanding of technical material suitable for the programme.

The programme promotes an innovative research-based teaching approach and is structured as follows:

- Rail Systems and Research Skills;
- Rail Freight Operations;
- Rail Major Project;
- Freight Transport Logistics;
- Rail Management, Economics and Planning;
- Multi-modal Freight Policy and Practice;
- Railway Environment and Energy;
- Rail Safety and Security.

The following two streams are available on the programme:

- Stream 1: Operations Management and Economics (OME) ;
 - i. Rail Planning and Time-Tabling;
 - ii. Economic and Environmental Appraisal of Transport Activities.
- Stream 2: Technical Management and Engineering (TME);
 - i. Rail Vehicles;
 - ii. Rail Infrastructure.

All candidates are enrolled on Stream 1. Candidates wishing to be enrolled on Stream 2 will have a short interview with the vehicles and infrastructure module leaders to ensure they have the appropriate qualifications and experience to follow the teaching and learning activities within Stream 2.

Key features of the programme (including what makes the programme distinctive)

This is a full-time, one year (three semesters) programme, starting in Mid-September, leading to the award of the degree of Master of Science (MSc). A range of railway, freight and logistics management, engineering, policy and practice, operations, economic topics are broadly covered.

The programme framework provides a multi-disciplinary multi-cultural environment to learn and develop the skills and qualifications necessary to pursue a management and/or engineering career in rail management, engineering and business logistics at large.

The rationale for this programme is, as follows:

- Introduce an MSc programme of excellence;
- Promote an innovative research-based Master programme on rail freight and logistics;
- Emphasise the international element of the programme (guest lecturers, industry partners, etc.);
- Provide opportunities for students and staff mobility;

The degree programme carries an innovative character, integrating research-based teaching activities such as independent studies, team and independent assignments, workshop assignments.

Specifically the programme includes a range of multi disciplinary activities such as: Lectures with discussion; Major research projects; Panel of experts; Analytical and Simulation modelling; Performance Analysis, Case Studies; Scenarios; Surveys; Lean production systems, Systems Design, Evaluation of network policy and strategy, Optimisation of Investment Choice, Economic Assessment; Road Mapping; Web Conferences; Technical Visits.

All students enrolled on the programme start in Mid-September with two weeks of preliminary work (pre-reading, literature review, undertaking a small-scale individual research activates, etc) as preparation for the compulsory 20 credit module *Rail Systems and Research Skills*.

The degree programme is fully synchronized with the university's internationalisation and sustainability agendas, carrying an international element. The programme is flexible enough to allow candidates with different educational backgrounds to join the programme and gain a wide range of intellectual, practical and transferable skills.

On completing the programme students will be able to demonstrate:

- Advanced knowledge of a broad range of analytical and simulation modelling research

methodologies commonly used in the development and analysis of rail logistics systems engineering, management, economics, policy, theory and practice;

- Knowledge of fundamental rail freight and logistics systems design;
- Knowledge of key professional, safety, security, environmental and ethical issues arising in the modern rail freight and logistics industry;
- The confidence to manage, evaluate and plan the organisation, implementation and successful completion of rail freight and logistics-based project/assignment/seminar-coursework;
- Knowledge of innovative rail logistics concepts, policy and practice for sustainable future around the globe.

Programme regulations (link to on-line version)

<http://www.ncl.ac.uk/regulations/programme/>

13 Criteria for admission

Entry Qualifications:

Candidates for this programme are requested to have a minimum of a Lower Second Class Honours level first degree or equivalent (a BSc or another MSc).

Admissions Policy/Selection Tools:

Candidates must apply through Newcastle University Enquiries to Registration System:

<http://www.ncl.ac.uk/postgraduate/apply/form/>

Non-standard Entry Requirements:

Candidates who hold non-standard qualifications and/or have relevant professional experience will be considered on an individual basis and will be required to attend for interview, if practical.

Additional Requirements:

All candidates fill in a questionnaire to give some indication of candidates' knowledge, educational background, goals, aspirations and expectations from the programme.

All candidates also engage in guided pre-reading to advise on the level of ability and the potential of the candidate to understand technical material suitable for the programme.

Level of English Language Capability:

For non-native speakers of English not otherwise exempted from the requirements of the University English Language Policy, the normal English language attainment required shall be 6.5 on the IELTS scale with at least 5.5 in all sub-scores (or its equivalent, e.g. TOEFL test)

14 Support for Student Learning

The Student Services portal provides links to key services and other information and is available at: <http://www.ncl.ac.uk/students/>

Induction

During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/ tutorials/etc. The International Office offers an additional induction programme for overseas students.

Study skills support

Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Numeracy support is available through Maths Aid and help with academic writing is available from the Writing Development Centre (further information is available from the Robinson Library).

Academic and Pastoral support

Each undergraduate and taught postgraduate student will be assigned a personal tutor.* A personal tutor is one part of a wider network of advice and guidance available to students to support their personal and general academic development. The module leader acts as the first point of contact for subject-specific academic advice. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Student-Staff Committee, and/or at the Board of Studies. Within the academic unit, students may also receive additional academic and pastoral advice from a range of other student-facing staff including degree programme directors, dissertation/project supervisors, and administrative support staff.

*Arrangements may vary for students taking special types of provision.

The University also offers a wide range of institutional services and support upon which students can call, such as the Writing Development Centre, Careers Service and Student Wellbeing Service. This includes one-to-one counselling and guidance or group sessions / workshops on a range of topics, such as emotional issues e.g. stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Student Union operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

Support for students with disabilities

The University's Disability Support team provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies.

Learning resources

The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities.

All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-session language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange

15 Methods for evaluating and improving the quality and standards of teaching and learning

Module reviews

All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the Board of Studies and/or the School Teaching and Learning Committee. Student opinion is sought at the Student-Staff Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Learning, Teaching and Student Experience Committee.

Programme reviews

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Learning, Teaching and Student Experience Committee. The FLTSEC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the Faculty Learning, Teaching and Student Experience Committee.

External Examiner reports

External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Learning, Teaching and Student Experience Committee. External Examiner reports are shared with institutional student representatives, through the Student-Staff Committee.

Student evaluations

All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Student-Staff Committee, and the Board of Studies. The results from student surveys are considered as part of the Annual Monitoring and Review of the programme and any arising actions are captured at programme and School / institutional level and reported to the appropriate body.

Mechanisms for gaining student feedback

Feedback is channelled via the Student-Staff Committee and the Board of Studies.

Faculty and University Review Mechanisms

Every six years degree programmes in each subject area undergo periodic review. This involves both the detailed consideration of a range of documentation, and a review visit by a review team (normally one day in duration) which includes an external subject specialist and a student representative. Following the review a report is produced,

which forms the basis for a decision by University Learning, Teaching and Student Experience Committee on whether the programmes reviewed should be re-approved for a further six year period.

Accreditation reports

Additional mechanisms

16 Regulation of assessment

Requirements:

The pass mark is 50.

Progression is subject to the University's Masters Degree Progress Regulations, Taught and Research and Examination Conventions for Taught Masters Degrees.

Limited compensation up to 40 credits of the taught element and down to a mark of 40 is possible and there are reassessment opportunities, with certain restrictions.

Common Marking Scheme:

The University employs a common marking scheme, which is specified in the Taught Postgraduate Examination Conventions, namely:

Summary description applicable to postgraduate Masters programmes

< 50	Fail
50 - 59	Pass
60 - 69	Pass with Merit
70 or above	Pass with Distinction

Role of the External Examiner:

An External Examiner, a distinguished member of the subject community, is appointed by Faculty Teaching and Learning Committee after recommendation from the Board of Studies. The External Examiner is expected to:

- See and approve examination papers.
- Moderate examination and assignment/study marking.
- Attend the Board of Examiners.
- Report to the University on the standards of the programme.

In addition, information relating to the programme is provided in:

The University Prospectus: <http://www.ncl.ac.uk/postgraduate/>

The School Brochure

<http://www.ncl.ac.uk/marketing/services/print/publications/ordering/>

Degree Programme and University Regulations:

<http://www.ncl.ac.uk/regulations/docs/>

The Degree Programme Handbook

Nota Bene:

Please note that this specification provides a concise summary of the main features of the Degree Masters Programme in Rail Freight and Logistics and of its learning outcomes that a typical master student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided.

The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Mapping of Intended Learning Outcomes onto Curriculum/Modules

Module	Type	Intended Learning Outcomes			
		A	B	C	D
MEC 8094	Block	1, 2, 3, 5, 7	1, 2, 3, 4, 5, 6	1, 2, 3	1, 2, 3, 4, 5
MEC 8032	Block	1, 3, 4, 5, 7	1, 2, 3, 4, 5, 6	1, 2	1, 2, 3, 4, 5
MEC 8033	Block	1, 2, 3, 5, 7	1, 2, 5, 6	1, 3	1, 2, 3, 4, 5
MEC 8034	Block	2, 3	1, 2, 5	1, 3	1, 2, 3, 4, 5
MEC 8035	Block	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6	1, 2, 3	1, 2, 3, 4, 5
MEC 8037	Block	2, 3, 6, 7	2, 3, 4, 6	1, 3	1, 2, 3, 4, 5
MEC 8038	Block	2, 3, 6, 7	2, 3, 4, 6	1, 3	1, 2, 4, 5
MEC 8039	Block	2, 3, 7	2, 3, 4	1, 3	1, 2, 3, 4, 5
MEC 8040	Block	2, 3, 6, 7	2, 3, 4	1, 3	1, 2, 3, 4, 5
MEC 8041	Block	2, 3, 7	2, 3, 4	1, 2, 3	1, 2, 3, 4, 5
CEG8408	Block	1,2,4,6,7	1,2,4,6	2,3	1,3,4,5
CEG8413	Block	1,2,7	1,4	1,3	3,4,5

